

**WORK PACKAGE 4 (PHASE 2):
ANALYSIS OF THE LEGISLATION AND
EMERGING REGULATION AT THE EU COUNTRY LEVEL
DELIVERABLE 4**

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INTRODUCTION

The overall objective of EUROMARKET is to study the likelihood, nature, and forms water liberalisation may take in Europe in the foreseeable future. This research project aims at analysing the consequences of de facto and de jure liberalisations of the water supply and sanitation sectors in economic, ecological, social, institutional, and organisational and legal terms, by means of exploring different liberalisation scenarios. In order to do so, it seeks (1) to understand the currently existing structure of the water sector in Europe in the areas of supply and sanitation excluding self-supply (agriculture, industry) and in-stream uses such as hydroelectricity, (2) analyse the existing and potential dynamics of the water sector as a result of its partial and potential liberalisation, and (3) assess the implications of such dynamics in terms of their economic, ecological, social, legal, and institutional implications. More precisely, the research project is structured around five distinct steps:

1. Examine the explicit and implicit approaches and policies of the European Union in the water supply and sanitation sectors (workpackage 1).
2. Analyse the existing and potential dynamics of the water supply and sanitation sectors as a result of both de facto and de jure liberalisations. This is done by breaking down such liberalisation into three separate dynamics, namely (1) market dynamics, (2) enterprises strategies, and (3) legislative/regulatory dynamics (WPs 2, 3 and 4).
3. Identify so-called “water liberalisation scenarios” on the basis of these three separate analyses. The research assesses the likelihood of one or several water liberalisation scenarios in the water supply and sanitation sectors (WP 5).
4. Assess the various implications of the so-identified scenarios, namely (1) economic implications pertaining mainly to the future evolution of the price of water, but also of water pricing mechanisms, (2) ecological implications pertaining mainly to water quality and quantity, but also to health and sanitary standards, (3) socio-political implications pertaining mainly to employment, qualification and the nature of work, (4) legal and organisational implications pertaining mainly to ownership,

management, and legal status of the operators, and (5) institutional implications pertaining mainly to the rules regulation the relationships between public authorities, (private and public) operators, consumer representatives, and regulators. In short, the research conducts an assessment of water liberalisation's main consequences (WPs 6, 7, 8 and 9).

5. Develop practical recommendations for European policy makers in light of the likely water liberalisation scenarios and their broad implications (WP 10).

This research consequently studies the real and potential dynamics of the water supply and sanitation sectors in terms of emerging markets and competition. This dynamics (sector-based dynamics, market dynamics and regulatory dynamics) has, in our view, three different dimensions, which need to be better studied and understood both in their own right, as well as in their interaction. This is, in fact, the originality of the proposed research project:

The first Work Package (WP1) consisted of reviewing the explicit and implicit European policies in water services. In this regard, three aspects need to be taken into account: 1) the drinking water and sanitation standards, 2) the management of natural resources (in particular the Water Framework Directive), and 3) the liberalisation processes of the network industries. The main challenge of the first work package was to determine whether and to what extent the current EU policies in water standards, resources management, and liberalisation of the network industries could constitute a general framework for analysing the possible evolution of the WSS, especially when it comes to its liberalisation.

The EUROMARKET project is currently in its second phase, which comprises three workpackage. The present deliverable (D4) is the result of Work Package 4, which belongs to the second phase of the project. It focuses on the analysis of legislation and emerging regulation in the water supply and sanitation (WSS) sector in selected European Union Member States¹. We conduct this comparative policy analysis around the following research

¹ Referring to Work Package 1, we define the WSS sector as all activities involved in the supply of drinking water and the collection and treatment of wastewater. We focus our attention on services for urban and rural uses (domestic, commercial, industrial services connected on collective networks), excluding the transfers of raw waters over long distances and irrigation. The implementation/management of WSS services may be shared

questions: Is there a trend towards harmonisation of the regulation and liberalisation of WSS services across EU countries? Do we observe rather an international convergence or a national or sector-based path dependency? What are the main differences in the regulation of WSS services observed between the selected countries? We attempt to find out the regulatory framework that governs the WWS sector. We look at recent changes in legislation, as well as the context or motivation of change: the creation of new regulatory bodies, the evolution from a legislative approach towards an economic regulatory approach, and so on.

The present report (Deliverable 4) is organised in ten chapters. It proposes an analytical description of the WSS policies in nine selected countries (France, Spain, The Netherlands, Sweden, Italy, Portugal, Germany, England & Wales, and Belgium) (Chapters 2 to 10). The country case studies were conducted with the aim to provide an overview of the legal trends towards harmonisation of WSS policies and liberalisation within the European Union. The comparison of these national country cases is presented in Chapter 1. This chapter synthesises Work Package 4, but necessarily puts much national specificities aside in order to focus much on the legal issues at stake within the European Union. All the theoretical and methodological elements of Work Package 4 are also presented in the introduction of Chapter one

between an authority responsible for the general organisation and political decisions, and an operator responsible for operation, maintenance and, in some cases, investments (EUROMARKET 2003: 9).

1. CHAPTER 1: THEORETICAL FRAMEWORK AND METHODOLOGY: COMPARATIVE POLICY ANALYSIS

Workpackage 4 describes the current administrative regulatory framework that governs the WWS sector in different countries and attempts to identify the future trends in the evolution of the legislation. Comparative policy analysis provides the methodological tools of the present report (Part 1.1). The comparison is backed on selected case studies that were conducted separately (Part 1.2).

1.1. INTRODUCTION TO COMPARATIVE POLICY ANALYSIS

The theoretical framework that underlies the study of water legislations and regulations in the EU Member-States is the Comparative Policy Analysis. By applying this approach, the contribution of this Deliverable to the project EUROMARKET consists of examining "*how*" and "*why*" governments pursue particular courses of action or inaction in the water and sanitation sector (Heidenheimer et al. 1990). It aims at providing a broader empirical knowledge base on how public policies are designed in the WSS sector. The paragraphs below describe the main theoretical concepts and methodological tools mobilized for describing water policies adopted and implemented by nine EU-Member-States.

1.1.1. *Public Policy*

A public policy is defined as a series of intentionally coherent decisions or activities taken or carried out by different public – and sometimes – private actors, whose resources, institutional links and interests vary, with a view to resolving in a targeted manner a problem that is politically defined as collective in nature. This group of decisions and activities gives rise to formalised actions of a more or less restrictive nature (outputs) aimed at modifying the behaviour of social groups presumed to be at the root of the collective problem to be resolved (target groups, e.g. polluting industries) in the interest of the social groups or the environment who suffer the negative effects of the problem in question (final beneficiaries, e.g. producers and consumers of drinking water, fishes).



Thus, the term public policy refers to a large number of legislative and administrative activities aimed at the resolution of real problems. Most modern legislation is only effective when the political, administrative and social actors involved in the different institutional arrangements are involved in the decision making. The desired effects are only attained, however, in the aftermath of a group of complex decisions that form a sequence between the centre and the periphery. It is this set of decisions and activities that is defined here as a “public policy” – decisions taken by public (and sometimes private) actors which are aimed at channelling the behaviour of a target population so that a collective problem which society is not in a position to manage on its own can be resolved by public effort. This set of decisions includes the decisions taken at all stages of public action, and also includes general and abstract rules (laws, decrees, ordinances etc.) and the individual acts and concrete products that arise during policy implementation (administrative decisions, authorisations, subsidies etc.).

Of course, various public policies are conducted within the WSS sector. This study distinguishes however four main public policies that are related to the regulation of the production and the distribution of drinking water and, of the sewerage and treatment of wastewater. These four public policies cover the whole chain of the WSS sector.

1.1.2. Policy Cycle

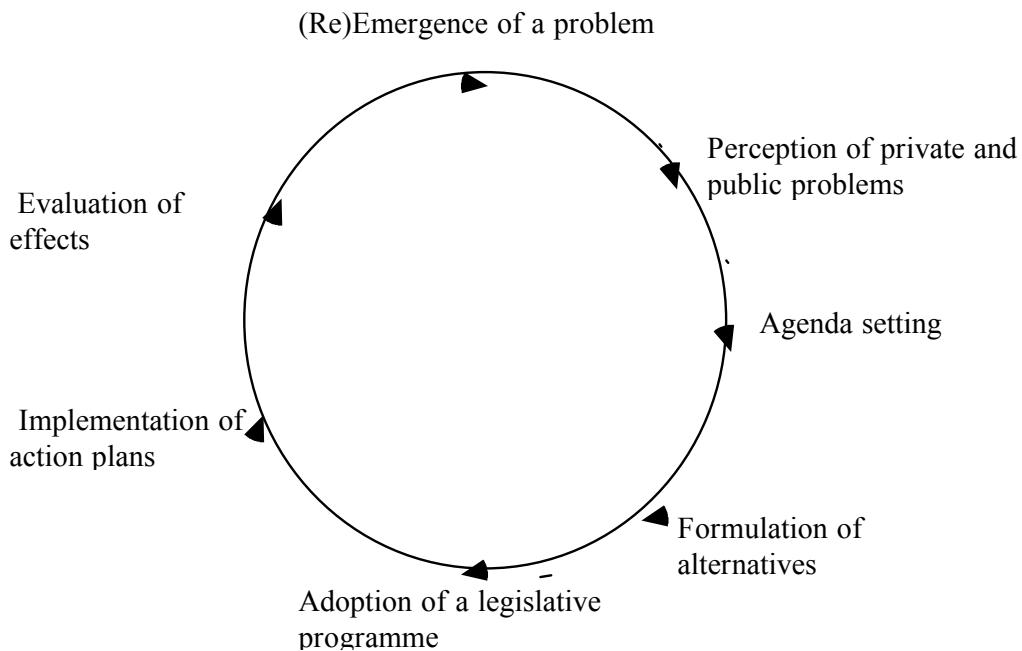
Numerous authors² have tried to create a diagram conveying the unfolding of the decision and implementation processes involved in a public policy. The overall impression that emerges from the literature is one of a “policy cycle” starting with the emergence of collective problems and progressing to the evaluation of the results obtained, as shown in Figure 1-1.

This approach based on the policy life cycle model (see Figure 1-1) should be understood as a framework and not a rigid grid. The phase involving the *emergence and perception of problems* is defined as a situation triggering a collective need, an absence or dissatisfaction, which is identifiable directly or via external manifestations and for which a solution is sought. More generally, a problem exists when there is a difference between the current and desired

² See review by Parsons (1995: 78-79).

status of a situation. Nevertheless, a significant number of social problems exist that are not the subject of a public policy. The passage from the existence of a problem to its political processing results from a “social [re]construction” of this problem which itself is related to cognitive capacities and mobilisation of the State and social actors (e.g. measurement of pollutants). The *agenda setting* phase corresponds to the consideration by the key actors of the political-administrative system of the numerous requests for action made by social groups or even the public services themselves. The *policy formulation* phase presupposes the formulation of a political-administrative programme, i.e. the selection of objectives, instruments and procedures to be implemented in order to resolve the problem under consideration. The *implementation* phase consists in the adaptation of the policy programme to the concrete situations encountered (production of administrative outputs). This phase is generally a lot more complex than it seems or is assumed by policy analysts. Here several screening mechanisms will come into play (for example, non-execution, selective application). Finally, the *evaluation* phase, which we consider as a constituent element of a policy, aims to determine the results and effects of a policy in terms of the changes in behaviour of target groups and problem resolution (outcomes).

Figure 1-1: The policy life cycle



Source: adapted from Parsons (1995: 77)

While analysis based on the policy cycle offers certain advantages, it also involves a number of restrictions. (1) This is a descriptive approach which can be deceptive as the chronological course of the policy process does not necessarily coincide with the order of the different stages in the model. Thus, a programme may be implemented prior to its precise formulation during the emergence of new problems. Breaks may also occur in the process with the reformulation of the public problem and the solutions before the measures initially planned are implemented and/or evaluated. (2) This heuristic approach does not enable the development of a true model of the causality of public policies and the identification of logical links between the different stages. It runs the risk of giving an artificial coherence to the policy by prompting the analyst to construct links between elements that do not exist in reality. (3) The policy life cycle model is in line with a legalistic interpretation of public action (“top down” approach) and centred on state action, and it fails to take account of an approach that originates with social actors and their context (“bottom up” approach). (4) This approach does not make it possible to go beyond a sequential analysis and consider, in particular, several cycles unfolding at the same time or the possibility of incomplete cycles.

In order to go beyond the policy cycle, the analysis conducted in WP4 focuses on seven specific elements of each of the four public policies adopted in the WWS sector: policy problems, policy objectives, policy instruments, institutional arrangements, target groups, policy outputs and outcomes and, the action logic of the public policy. Each element is discussed briefly in the following paragraphs.

1.1.3. Policy Problems

In order to analyse a problem relevant to the public sphere and on this basis legitimise public intervention, it is necessary to adopt a constructivist approach. In effect, it is reasonable to assume that no objective fact constitutes a problem in itself. The – social and then political – definition of a problem always represents a collective construction directly linked to the perceptions, representations, interests and values of the actors concerned on an individual basis and/or as part of organised groups. Thus, all social reality should be understood as a historical construction, situated in time and space. It always depends on the constellation of the persons affected by the problem whose behaviour is – correctly or incorrectly – identified as being at the heart of the problem in question.

It is never a question of denying the objective conditions that constitute a problematic situation (for example, the existence of an elevated level of effluent which represents a threat to water quality, the permanent nature of droughts or floods, etc.), but of stressing that these established facts only represent one of the dimensions – even if it proves fundamental in some cases – that constitute a social problem. Thus, the role of the policy analyst consists in identifying the processes, actors and arguments by means of which these objective conditions are perceived and are defined as problematic and requiring state intervention.

In order to simplify the coding of the policy problems defined by the EU-Members States in the WSS sector, we classify them in a limited number of categories: water availability and supply, drinking water demand, quantity problem, quality problem, conflicts between drinking water production and agriculture and industry.

1.1.4. Policy Objectives

Each public policy includes a definition of a more or less explicit goal, on the basis of which the public intervention may be conceived. The objectives define the status to be attained by the adopted solution which would be considered as satisfactory. They describe the desired social status in a field of action once the public problem is resolved. At the level of the legislation, the objectives are defined in a very abstract way. In contrast, more concrete, quantified and measurable target values are found at the level of the regulatory acts (decrees or ordinances, circulars or administrative directives). The more concrete the values formulated for the objectives are formulated, the easier it is to establish whether they have been effectively realised (or not). Concrete objectives imply the definition of units of measure or indicators which refer to the effects of the programmes in social reality.

To categorize the policy objectives within the WSS sector, the following types of policy objectives are defined: environmental objectives (surface water and groundwater quality/quantity, prevention against pollution, wetlands protection, etc.), social objectives (good quality, supply to all, price affordability, etc.) and economic objectives (cost-recovery, infrastructure financing, etc.).



1.1.5. Policy Instruments

The policy instruments define the modalities of intervention or measures planned to fulfil the objectives of a public policy. Likewise, they define the target groups, to whom the measures will be applied. Without doubt, these are the elements that best characterise a policy because they define its target groups, its level of interventionism and the type, scope and quality of the proposed public intervention and services. Policy instruments can take a number of forms; the following four are the main forms usually identified in this context:

- *The regulatory/prescriptive* mode is based on bans, obligations and the allocation of various rights which may be the object of sanctions in the case of failure to respect them. In this sense, it aims to directly influence the behaviour of target groups. The instruments cover the general prohibition of an activity (for example, construction), the lifting of a ban by the granting of a permit or special authorisation (for example, authorisation to withdraw groundwater, etc.). They also include the general authorisation of an activity (for example to produce drinking water) possibly accompanied by a ban applicable in particular situations (for example, by respecting quality standards). Finally, it may also take the form of a general obligation (to discharges dangerous substances or to report on drinking water quality) with a sanction (e.g. fine) imposed in the case of non-compliance.
- *The incentive* mode is more indirect than the regulatory mode. It works on the basis of financial payments aimed at influencing the behaviour of target groups by means of the “price signal”. The incentive may be of a negative (e.g. tax, incentive levy) or positive nature (e.g. tax relieve, subsidy) with the intention of (re)distributive effects.
- *The persuasive/informative* mode uses an information strategy to convince target groups of the proposed objectives. This type of public action often accompanies other forms of intervention (e.g. campaign on rational water use).
- The last intervention mode involves the *self-regulation* of target groups. In this case, State intervention consists in supporting the organisation of target groups and the “private” definition of rules of conduct (e.g. professional standards, code of good practice).



This empirical study applies to these four categories of policy instruments for describing the content of the intervention mode within the production, distribution, sewerage and treatment policies.

1.1.6. Institutional Arrangement for Policy Implementation

The *institutional arrangement* of a policy represents the structured group of public and para-state actors who are responsible for its implementation. It results from decisions on the distribution of formal competencies (i.e. the attribution of responsibility for the new policy to existing or newly created administrative services), the allocation of various resources, i.e. financial, human etc., which are at the disposal of the implementing authorities and also the intra-organisational and inter-organisational management of the administrative units involved. An institutional arrangement incorporates not only public actors, but also all of the private actors who may be assimilated into it due to the fact that they are invested with public power, and who, based on this delegation of responsibility, participate on an equal footing in the production of concrete actions (outputs) associated with the policy in question.

In fact, the institutional arrangement of public policy links these actors through formal or informal institutional rules governing the assignment of specific functions with respect to the action to be taken in the relevant social area. These rules facilitate the (positive or negative, proactive or reactive) substantial co-ordination between the different services that perform the multiple administrative tasks required under the targeted application of one and the same policy. This is reinforced by procedural rules give rise to a network of horizontal and/or vertical interaction between the actors (procedural coordination). As a result, an institutional arrangement may be interpreted as the organisational and procedural basis of a policy. It represents the network of public and private actors responsible for the implementation of a policy without, however, encompassing the entire group of actors in the “policy arena” who are affected by the problem dealt with by the policy in question (policy network).

In order to simplify the empirical analysis of the policy networks, the study focuses mainly on two dimensions: the government level (national, regional, local) and the (public, private, mix) status of the administrations, para-state bodies (independent regulatory agency) and

operators involved in the WSS sector. This allows to identify the main challenges for the vertical and horizontal coordination within the policy networks.

1.1.7. Target Groups of Policy Instruments

The *target groups* of a public policy are made up of people (individuals or legal entities) and organisations whose behaviour is judged politically to be the (in)direct cause of the collective problem that a given policy aims to resolve. Consequently, the target groups' decisions and activities are – or will be – the subject of concrete state intervention. The policy in question will impose obligations on them or grants them rights. The legislator and/or administration reason that, as a result of such measures, the target groups will alter their behaviour and that the collective problem can be resolved or at least mitigated.

In other words, the intervention hypothesis of public defines the methods of government action that will influence the decisions and activities of the designated target groups so that these will be compatible with the political aims. Thus the state can compel them to change their behaviour (for example through the imposition of obligations, bans, enforcing compliance with requirements for permission-granting schemes), induce a change of behaviour by positive or negative economic incentives (for example, taxation schemes, tax relief, subsidies), or again suggest it through the manipulation of symbols and information (for example, campaigns to heighten public awareness of an issue, training programmes). The effectiveness of each method of government intervention with regard to the resolution of the collective problem depends, among other factors, on the practical relevance of the behaviourist hypothesis that underlies it. This process of pre-emptive evaluation of private actors' capacity to react to government intervention is, however, contingent on the social structure of the target groups. It is up to the state to anticipate the possible reactions of the relevant target groups if it wishes to modify their behaviour with some degree of predictability.

The main target groups identified in WSS policies are the water operators, the communes, the consumers, industries, farmers and households.



1.1.8. Policy Outputs and Outcomes

The formal implementation acts of a policy are defined as *outputs*. They are the set of end products of the political-administrative processes which, as part of the scope of its implementation, are individually aimed at the members of the defined target groups. The final acts comprise administrative products directly aimed at the target groups by the administration and the other (private and para-state) bodies responsible for the execution of public tasks. These products comprise all kinds of decisions or administrative acts (for example, conditional authorisations, individual bans, protection perimeters, etc.), the granting of financial resources (for example subsidies for sewerage, fiscal exonerations for rational use measures), acts involving the collection of money (for example, indirect taxes, levies, fines), police intervention, direct services (for example provision of drinking water by public enterprises), advisory activities and organisational measures. The implementation acts are characterised by the fact that they create an individual relationship (in particular in the case of formal acts, even those of a legal nature) between the persons that constitute the policy target groups and the competent public instances responsible for policy implementation.

It is generally necessary to collect a large volume of data in the course of the analysis of implementation acts. Depending on the nature of the question being posed, it is usually necessary, for example, to obtain information on the existence, quantity and quality, spatial, temporal and target-group distribution, substantial and institutional content of all administrative acts that are produced during the period being studied. The implementation acts of other public policies must also be documented insofar as they may have an influence on the behaviour of target groups and the evolution of the problem to be resolved.

The policy *outcomes* are defined as all of the effects in relation to the public problem to be resolved that are attributable to the changes in the behaviour of target groups, which are triggered in turn by the implementation acts (outputs). The results (outcomes) literally represent that which “comes out of” the state activity. Thus, the outcomes include all effects – desired and undesired, direct and indirect, primary and secondary etc. To identify and quantify the results targeted by a policy, the analyst generally refers to the definitions of objectives and evaluative elements provided by the legislation and regulation and, if necessary, concretised in action plans and implementation acts.

1.1.9. Action Logic

Every policy can be interpreted as a theoretical construction whose consistency and rationality must be questioned analytically: a public policy can be interpreted as a theoretical construction, in the sense that it implies an *a priori* representation of the measures implemented, of the actors' behaviour, of the sequence of measures undertaken and of the effects produced on society'. This theoretical construction can be described as the 'action logic' (or model of causality, theory of social change, policy rationale). It comprises a causal hypothesis and an intervention hypothesis, the analysis of which makes it easier to discern the links between the different actors and the ways in which they are altered in the aftermath of public intervention.

The *causal hypothesis* provides a political response to the question as to who or what is "guilty" or "objectively responsible" (i.e. without subjective guilt) for the collective problem to be resolved. Thus, the definition of the causal hypothesis of a policy consists in designating the policy *target groups*. This attribution of responsibility is still determined by political value judgements and by the way in which the problem is perceived. Furthermore, uncertainties of a scientific nature with respect to the effective (objective) functioning of the intervention sector greatly limit the possibility of correctly identifying the target groups at the root of the problem. The ineffectiveness and adverse effects of certain policies often derive from false or incomplete causal hypotheses.

The *intervention hypothesis*, it establishes how the collective problem requiring resolution can be mitigated and, indeed, resolved by a policy. It defines the methods of government action that will influence the decisions and activities of the designated target groups so that these will be compatible with the political aims (see part 1.1.5 on policy instruments above).

The suggestion that a policy is based on a – usually implicit, partial or indefinite – model of causality (i.e. hypotheses of causality and intervention) derives from an instrumental and rationalist interpretation of public intervention. This narrow view of things is naturally open to criticism. It must be emphasised, however, that, even in cases where a policy has been adopted and implemented for a reason other than the resolution of a collective problem (for example, in order to affirm the power of the state in a symbolic way, for the purposes of electoral competition, personal, organisational or institutional prestige, selective targeting of a

certain social class), the methods applied inevitably generate new framework conditions for public and private actors, and the effects that derive from this can potentially affect the course of social change.

Each country case study tries to formulate (as an analytical reconstruction) the action logic underlying the four public policy areas within the WSS sector. Furthermore, each case study shows how this action logic evolves in time during the last century, illustrating the dynamics of the public intervention.

1.2. METHODOLOGY: COMPARATIVE CASE STUDIES

The Comparative Policy Analysis Approach presented above is applied systematically for analyzing the WSS policies in nine EU Member-States.

1.2.1. *Selection of the National Case Studies*

The countries analysed and compared here are Belgium (B), Germany (D), Spain (E), England & Wales (E&W), France (F), Italy (I), the Netherlands (NL), Portugal (P), and Sweden (S). These countries were chosen because there are representative of the water policies conducted in Europe. They are also characterized by very different hydrological situation as well as political and institutional systems (majoritarian versus consensus democracies, unitary states versus federations, etc.). Thus, by taking into account the most divergent policies, water situation and political systems, the comparative study allows to isolate the relative influence of these dimensions on the evolution of WSS policies.

1.2.2. *Structure of Case Studies: Diachronic Analysis*

Each case study is built according to the same structure. The core element of the case study is a policy analysis of legislation in force in the WSS sector. This policy analysis presents the design of national regulation, i.e. policy objectives, instruments, target groups, actors of implementation, action logic and policy effects, for each sub-sector of the WSS sector, i.e. resource access, drinking water production, drinking water supply, sewerage and treatment. It establishes an instant picture of the present situation, presented in a synthesis table made for



each country case. The dynamics of the case study are introduced with a diachronic analysis that looks at both the past and the foreseeable future. We must know from which situation we are starting in order to assess future changes in legislation. A history of water laws in each country helps to understand the origins of the current legislation and organisation of the sector. Future trends are drawn on the basis of the observation of both pending legislation and overall trends towards liberalisation. As such, the country case studies provide the material necessary to the policy comparison, and add contextual elements to each particular case.

2. CHAPTER 2: COUNTRY REPORT FRANCE

PIERRE BAUBY AND SYLVIE LUPTON

2.1. INTRODUCTION

France has a number of specific characteristics embedded in its system of organisation, management and regulation of water and wastewater treatment, characteristics which lead to the co-existence of several schemes:

Water supply and the wastewater treatment falls mainly under the responsibility of municipalities, a number of which can team up together to accomplish the task, however, this leads to a system which is seemingly pretty scattered (more than 13 000 organising authorities).

Municipalities have a choice between either directly managing the services of water and wastewater treatment themselves or, delegating such management to other specialised firms whilst preserving the ownership of public infrastructures.

Such delegation is an old practice, which had developed quite rapidly over the last decades.

On this basis, big private corporations came into being and provided the public municipalities not only with the management of water and wastewater treatment, of which they have now become world leaders, but also all other services ...

All these measures including all their diversity, form what France calls “Public Service”, which shows that in the French conception, such a service covers national as well as local public services, management by public entities just as that by private groups.

There is therefore, in France, a co-existence of two schemes of management of water and wastewater treatment: one by direct management, without real motivation for efficiency; and the other by delegated management, with some weak regulation.

2.2. GENERAL FRAMEWORK FOR WATER MANAGEMENT

2.2.1. *Institutional framework*

In France the management of water supply and the services of wastewater treatment fall under the competence of some 36 000 municipalities³; they can, if they wish team themselves up within inter-municipal cooperation structures: inter-municipal syndicate, municipal or town communities; thus the number of water supply services is about 13 500, and a little more for those of wastewater treatment.

These local authorities are responsible for the organisation of services. They have to choose between two types of management, direct management, that is through a public operator, *régie* (which is the case today for 21% of the population in water supply and 47% in wastewater treatment) or, on the other hand delegation contracts, with such contracts being signed for periods running from 7 to 20 years and awarded on the basis of tender procedures open to competition (3 main groups share three quarters of the market).

The service manager, be it public, private or mixed person enjoys, in carrying out this management, territorial monopole (over a given zone) and time monopole (over a determined period).

2.2.2. *Resource status and resource use*

Water is in general abundant in France, despite local and periodic disparities: about 1000 billion m³ of reserves, and 170 billion m³ annually from internal resources. Regarding water abstraction, around 32 billion m³ of water is abstracted: energy (cooling) withdraws 59%, industry withdraws 12%, agriculture withdraws 11%, and drinking water withdrawals represent 18%. Regarding water consumption, the latter amounts to 3.8 billion m³ of annual net consumption⁴. Agriculture consumes 68%, industry consumes 5%, energy represents 3%,

³ Since 1790, municipalities are responsible for the maintenance of public health and for providing drinking water.

⁴ The major difference between abstraction and consumption volumes lies in the important quantities of water abstracted by the energy sector (nuclear and thermal plants), and practically entirely returned to nature.

and finally drinking water represents 24% of net consumption. In 1998, 5.6 billion m³ of drinking water was distributed and 3.8 billion m³ charged for.

At the end of the year 2000, France had 36 581 water catchments for collective conveyance of potable water; 95% are underground catchments, representing 64% of distributed water, 5% surface catchments producing 36% of the distributed volume.

2.2.3. General description of the history of water laws

France had no clear water policy before 1804. However, one can mention that in 1291, Philippe le Bel set up the management of water and forests : « Maîtrise des Eaux et Forêts ». Moreover, a number of laws or decrees emerged in 1515, 1554, and 1566 governing the use of rivers in the royal area but leaving room for local traditions and practices. In 1790, municipalities were held responsible for maintaining public health and hence for the provision of drinking water. From 1804 onwards one can distinguish four phases of the French water policy:

2.2.3.1. Phase I: 1804-1898: Emergence of water laws of the ownership of water

The Civil code in 1804 confirmed that the State was the owner of navigable waterways. However, disputes arose due to different uses and ownership of water. Different laws were set up mostly concerning the agricultural use of water in order to add coherence to water use and ownership (law of 1829 on fishing, law of 1845 on aqueducts, laws of 1854 and 1856 on drainage, 1858 law on floods). One can note that although municipalities are held responsible for the maintaining public health and the provision of drinking water, Prefects are the ones that control finances, and rarely let communes use money to develop infrastructure. This explains how the distribution of water is left in the hands of private companies like *General des Eaux* (created in 1852) and *Lyonnaise des Eaux*, created in 1880 (Barraqué and al, 1998). With the development of France in the second half of the 19th century (urbanisation and industrialisation), the need for a more complex legislation is felt and the 1898 law is established...



2.2.3.2. Phase II: 1898-1959: A more complex water policy

The law of 1898 introduces more precision in the water law : ownership is recognized for rainwater, spring water, ponds and canals. The use of navigable rivers is subject to compulsory authorization. State intervention is more and more important. The 1919 law on hydropower use regulates water courses: nobody can use watercourse power without obtaining a concession to operate and an authorisation to withdraw water (Sangaré and Larrue, 2001). As there was a legal void regarding groundwater, an executive enactment of August 1935 was instituted: boreholes of more than 80 metres were subject to prior authorisation by the Prefect. In 1956, a decree on navigable waterways was set up, specifying rights of private persons on national waterways. Health preoccupations emerge with the ordinance of 1958 integrating drinking water into the public health code. Water distribution is still poor: in 1945, 70% of rural communes did not have any distribution network.

2.2.3.3. Phase III: 1959-1992: Rational management of the resource

The urban development and agricultural as well as industrial growth led to important water abstraction and discharges in rivers. There was a need for a more rational management of the resource (Sangaré and Larrue, 2001). The Water Act of the 16th December 1964 introduced a global management procedure, set up a police to verify the quality of water and established 6 basins agencies (*Agences de l'eau*), for the consultation, promotion and financing of water management. Pollution and consumption fees are also set up.

Wastewater starts to be treated in the 60ies. Environmental concerns emerge and the Ministry of Environment is created in 1971. Water distribution develops in the eighties and enables a distribution of drinking water for practically all the French population. This also coincides with the development of water companies, that also developed with the growing requirements on drinking water quality, very much influenced by 75/440/EEC and 80/778/EEC directives on drinking water (transposed in French legislation by the decree n. 89-3 on drinking water)⁵.

⁵ See WP1, phase 1 for more details on this topic.



2.2.3.4. Phase IV: 1992-2003: Growing resource protection and control of operators

Resource protection is seriously dealt with starting from the nineties. The Water Law voted on 3/1/1992 confirmed that water was a national property, and that its protection and valorisation and the development of usable resources were of general interest. Water is also considered in this law to have an economic value. The law establishes global planning of water resources by setting up guide schemes for planning and management of water (SDAGE) prepared at the basin level and schemes for planning and management of water (SAGE) defined at local level. It also reinforces the role of municipalities regarding wastewater treatment. Pollution from agriculture is also regulated, and comes directly from the influence of the 1991 EU directive, and implemented by decrees in 1993 and 1996.

Several laws also focus on a increased control of water operators. The Barnier law of 1995 focuses on the reinforcement of the protection of the environment, and fixes the duration of delegation contracts to a maximum of 20 years and prohibits payment of entry fee by the delegatee; annual reports on the price and the quality of service should be written, every year, by the municipality. The Sapin law is voted on 29/1/1993, and focuses on the prevention of corruption and on the transparency in economic activities and government procedures. This law is not specific to the water sector, but renders it obligatory in case of delegation contract to apply competition rules and calls for tender on the basis of clearly defined specifications indicating objectives sought in volume, cost and service; tacit renewals are prohibited. Finally, the Mazeaud law voted on 8/2/1995 on public procurement and delegation of public service supplements the Sapin law by obliging the operator to present, every year, to the delegating authority a report including, in particular, accounts of all operations accruing to the delegation and an analysis of the quality of service; the regional chamber of auditors can check the accounts of the operator.



Figure 2-1: Phases of the French water policy:

PHASES	POLICY DESIGN	ACTORS OF IMPLEMENTATION
1. 1804-1898 Emergence of water ownership laws	<u>Objectives</u> : establish rules for water ownership and use <u>Causal Hypothesis</u> : clarifying water rights enables settling conflicts over use <u>Instruments</u> : Legal framework (1804 civil law) <u>Target groups</u> : water users (mostly farmers)	Ministry of Agriculture, Public Works, Prefects
2. 1898-1959 A more complex water policy	<u>Objectives</u> : regulation of water courses <u>Causal Hypothesis</u> : water courses will be better controlled if prior authorisation is needed <u>Instruments</u> : legal framework (law of 1898) <u>Target groups</u> : farmers, boatmen	Ministry of Agriculture, Public Works, Prefects
3. 1959-1992 Rational management of the resource	<u>Objective</u> : control of water abstraction and discharge; conform to EU requirements regarding drinking water quality standards. <u>Causal Hypothesis</u> : if we control water abstraction and discharges, then we can ensure better drinking water <u>Instruments</u> : 1964 water law, pollution and consumption fees <u>Target groups</u> : industries, households, farmers	Ministry of Environment, municipalities, Prefects, <i>Agences de l'eau</i>
4. 1992-2003 Growing resource protection and control of operators	<u>Objective</u> : protection of water resources, control of operators <u>Causal Hypothesis</u> : if we regulate water pollution (special focus is given to agricultural pollution in this decade), then we can ensure better water quality intended for drinking; if we establish rules for operators, we can better control water management and avoid monopolies' abuse of power. <u>Instruments</u> : pollution fees for farmers (intensive husbandry), quality standards, legal framework for delegation contracts <u>Target groups</u> : farmers, households, water operators	Ministry of Environment, Ministry of Agriculture, Ministry of Health, Basin Agencies, Prefects, municipalities

2.2.4. Main public and private actors involved

Principal actors concerned by services of water and cleaning include municipalities or groups of municipalities, the three big groups providing services to municipalities (Veolia-Environnement, Suez-Lyonnais, Saur), six basin Agencies, ministries under the coordination of the ministry of Environment, and consumers.

There is no regulation agency for water supply and wastewater treatment as opposed to what exists in most other network sectors; the plan for the creation of a High Council for public services in water supply and wastewater treatment, adopted in the first reading by the National parliament in January 2002 is not likely to be included in the projects of the present government.

2.2.4.1. Local authorities

The operational organisation of water services falls under municipalities' responsibility. Water supply services and waste water services are run separately. Municipalities are free to combine different schemes to organise these services (OIE, 2002a):

They can do it at municipal scale or gather within an association of municipalities (*syndicat intercommunal*) to which the responsibility of the organisation of the service is transferred. The transfer covers all aspects of the organisation, among which the choice of the management scheme (by a public or a private operator) and of the operator;

The running of the services may be done by a public operator (*régie*) set up by the municipality / the *syndicat* or may be delegated to a private company⁶. There are 7000 régies in France, but their number has considerably decreased. In 1980, they distributed 40% of the volume of water, and now they only distribute 20%.

Municipalities also have the duty to ensure and to control that drinking water standards, wastewater treatment and pollution standards are met (Elnaboulsi, 2001). Mayors have general police powers which allow them to stop pollution or prevent a catastrophe in case of serious danger (Barraqué and al., 1998). Municipal organizations must be financially self sufficient, and are "free to devise their own rate-setting scheme, regardless of whether the water system is managed directly by the municipality or delegated to a private company" (Elnaboulsi, 2001, p. 514).

In the past thirty years, local authorities have increasingly delegated the management of their services of water supply and wastewater treatment to private firms.

This tendency is due to a number of factors: first, the production and the distribution of water requires treatment procedures which are becoming more and more demanding in order to meet public health requirements and quality standards which are increasingly strict; second, wastewater treatment has developed and requires the installation of wastewater treatment plants which are much more demanding than the simple "everything into the drain" system. Some municipalities have met difficulties when trying to acquire the required high skills and

⁶ Cf. supra.

techniques. Delegation management provides the possibility for an integration of the conception, building and maintenance of an infrastructure or of a service.

Delegated management makes it possible, in cases of constrained budgetary situations, to call on private investments, without being obliged to go as far as “total privatisation” since the infrastructure remains the property of the municipality (as opposed to the reform introduced in England where there has been complete privatisation of regional firms)

It also enables the introduction of the logic of enterprise to replace administrative management and thus encourage efficiency in management.

Furthermore, the increase in water supply and wastewater treatment procedures generally leads to the increase in the cost of service, above the increase in productivity, and, contrary to the case of public services such as electricity and telecommunications, to increased costs for consumers, even if this is not the only cause of such increases. Delegation contracts, saves elected leaders from taking the responsibility of the rise in the price of water and, more generally, in the cost of the management of the service.

Delegated management, is supposed to bring together the advantages of a monopole (the delegatee enjoying the monopole over the duration of the contract) and those of competition (since competition rules must be observed at every renewal of the contract)

It should be remembered that delegated management was used in France for a number of years as a significant means of funding political activities and election campaign, which encouraged the development of corrupt practices and led to the introduction of the Sapin law voted on 29/1/1993 aiming at prevention of corruption and encouraging transparency in the economic activity and public procedures.

When a local authority opts for direct management of the service, it runs the service with its own personnel under its own responsibility with the obligation to balance revenue and expenditures

The contract between the local authority and the delegatee includes some obligations for the latter. The awarding of contracts is based on the principle of *intuitu personae*: negotiations of the contract are conducted freely on condition that the Sapin law of 1993 is respected



(obligation of advertising and calls for tender). Delegation contracts can last a maximum of 20 years (according to the Barnier law). There are different types of contracts, as the box on the next page describes.

Box 2-1: Different delegation contracts

Four types of contracts are used in delegation of industrial and commercial public services in France : concession, lease contract (*affermage*) –these two first types of contracts being the most common in France-, management contracts (*gérance*), and commissioner management contracts (*régie intéressée*):

Concession

The private firm finances and builds utility installations and manages them. The firm is remunerated directly by the consumers (through the price of the water). The municipality remains the owner of the assets. The concessionaire is responsible for the services including operation, maintenance, and management as well as capital investments for rehabilitation and expansion works. When a concession contract expires, all works and equipment are returned to the local authorities.

Lease contracts (*affermage*)

This is the most common form of privatisation: for drinking water services, 88% of communes have *affermage* contracts; for wastewater services, 85% of municipalities have this type of delegation contract. The private company rents the facilities to the commune, and is responsible for operation, maintenance and management of the service. The commune which remains the owner of the system, is responsible for capital expenditures for new projects, debt service and tariffs and cost recovery policies. The private company is responsible for operation and maintenance expenditures as well as billing, collecting and financing management work. Leaseholders must pay the municipality a rental fee (*surtaxe*) included in the price of water or wastewater services fixed in the contract, billed and collected by the private company. Lease contracts are generally set up for a period of 10-12 years.

Management contracts (*gérance*)

The municipal organization retains control of the infrastructure, preserves a share of responsibility related to operation and maintenance of the system, bears all the commercial risk and finances fixed assets and working capital. It has financial responsibility for the service and has to provide funds for working and investment capital. The responsibility of the operator is limited to managing its own personnel and services efficiently.

Commissioner management contracts (*régie intéressée*)

These contracts are the same as management contracts, but payments of the contractor are linked to the work performed instead of guaranteed payments. These contracts are rarely applied in France.

Source: Elnaboulsi, (2001)

2.2.4.2. The three main groups providing services to municipalities

The increase in technology, the diversification of needs as well as the growing autonomy of local elected leaders further strengthened by decentralisation, have resulted in an evolution of vertical and horizontal integration and in the formation of three major groups (*Compagnie générale des Eaux, Société Lyonnaise des Eaux-Suez, Bouygues-SAUR*) which have today become world leaders in this sector. Two of these firms, *Compagnie générale des Eaux* and the *Lyonnaise des Eaux* have their origins in the supply of drinking water and wastewater treatment services in the 19th century. Over time they have extended their domain of activities

to everything involving production and management in town. The third group, Bouygues, was created in the early 1950s and grew with the wave of urbanisation that took place in the 1960s and 1970s. These three groups engaged themselves in a vertical and horizontal integration movement and, today, they cover the whole of the network from the urbanisation section to buildings and civil works. They offer to local authorities all provisions necessary for the existing services; from financial know how and surveys to the installation and management of infrastructures, they can also, when required to do so, meet new demands (hospitalised old people's homes, cable television, mobile telephony, etc). They are found in all notable calls for tender organised by the local authorities as well as those organised by the State.

Table 2-1: Figures concerning the 3 main private operators in France (2000-2001)

	Générale des Eaux	Lyonnaise des Eaux	Saur	
	% of pop°	% of pop°	% of pop°	
Number of contracts	8,000	2,900	7,000	
Consumers served (millions)	45 (1)	23 (1)	6	10%
Drinking water	26	43 %	14	2 %
Wastewater treatment	19	31 %	9	15%

Source: OIE, 2002a

(1) A proportion of consumers are double counted as they are served by the same operator for drinking water and wastewater treatment

Delegation contracts concern 79% of the population served for drinking water supply (against 21% in *régies*), and 53% of the population served for wastewater treatment (against 47% in *régies*). Concerning sewerage networks, these have been historically managed through direct management (*régies*), but delegation has expanded now representing half of the wastewater collection system. Regarding the different delegation contracts explicated above, the different water companies share the following percentage of delegation contracts. Table 2-1 does not mention the other smaller water companies that provide drinking water and wastewater treatment services for 2% of the population served.



In such conditions, the delegation of public services for water is characterised by deep imbalances. This inequality exists between, on the one hand, the three big groups in possession of strong technical and financial capacities and, on the other hand, the 36 000 municipalities with a weaker negotiating and controlling capacity. This asymmetry of available information and competences distorts the power balance to the detriment of the elected leaders and local authorities. One can talk of the non regulation of the operator, even if the public municipalities have set up expertise tools of their service such as the “Service Public 2000” association⁷.

Furthermore, competition that exists between operators is often oligopolistic pseudo-competition either there exists an understanding or market sharing between them – nearly 90% of contracts are renewed to the same concessionary (ENGREF, 2001), or they demonstrate an opportunist behaviour in order to enter into the area with the intention of attaining very high productivity, during the many revisions or activities, whilst under-investing towards the end of the contract.

Considering these difficulties in ensuring a real regulation of the delegation of the service, some municipalities have found it necessary, in recent years, to go back to direct management of water and/or wastewater treatment.

2.2.4.3. *The six basin Agencies*

Water agencies, organised at the level of the six river basins (Artois-Picardie, Seine-Normandie, Loire-Bretagne, Adour-Garonne, Rhin-Meuse, Rhône-Méditerranée), enjoy the status of civil personality and financial autonomy. They contribute to the execution of activities of common interest by granting aid to territorial municipalities, industries and farmers who take the engagement to preserve the resources and the quality of water.

For each river basin, a basin committee is set up and brings together representatives from the State, territorial municipalities, users and competent personalities.. It prepares the funding

⁷ This association was created in 1996, by the AMF (*Association des Maires de France*- Association of mayors of France) and the FNCCR (*Fédération Nationale des Collectivités Concédeantes et Régies*-association of régies) in order to help municipalities out in the management of drinking water and wastewater services, with the growing complexity of legislation and techniques. This association provides expertise, assistance and advice to municipalities in their decisions regarding water management.

scheme for planning and management of water (SDAGE), which fixes directives for a balanced management of the resource. It also ensures the harmonisation of schemes for the planning and management of water (SAGE) prepared by the local Commission for water.

The local Commission for water (CLE) is composed of representatives from territorial municipalities, users and government. It defines the SAGE and ensures the follow-up of its implementation.

2.2.4.4. Ministries and administration

Several ministries are concerned with the management of water and wastewater treatment in France, without playing any key role. They are coordinated, under the supervision of the inter-ministerial Committee for environment, under the Prime Minister, and by the Ministry of Environment (which has since become the Ministry of Environment in the present government) and at the local level by Prefects.

However, four other ministries participate actively in the setting up and implementation of the water policy: the Ministry of Public Works (in charge of navigation), of Agriculture (non-domain rivers), of Industry (underground waters) and finally of Public Health (drinking water). Their action is essentially done through territorial services at departmental level coordinated by the prefect who is in charge of the State's water policy, regulation and enforcement. The DDAF (Departmental service of agriculture) is in charge of questions related to wastewater treatment, and controls the quality on non-domianial waters. The DDE (Departmental service of public works) assists communes in water service management and the setting up of infrastructure and controls public domain waters. The DDAFSS (Departmental service of public health) controls wastewater treatment standards and drinking water quality. At regional level, the DRIRE (regional service of ministry of industry) controls industries and pollution.

2.2.4.5. Consumers

Users are a typical example of captivated clientele: they do not have any choice , whereas the service provider continues to enjoy a service monopoly. They have a very limited capacity for negotiating the price they pay for the service, and are often victims of abusive clauses. Some occasional improvement on the matter have been made over the past few years in order to



reinforce prior information to consumers and improve the clarity of bills. Nevertheless, such measures do not modify the structurally unbalanced situation in which consumers are with regard to service providers.

Furthermore, consumers do not always evaluate the cost of the service. The service is funded by money from the bills only in the case of water distribution and wastewater treatment. But the real cost is hard to evaluate in the situation of collective housing as it is included in the general charges. Lastly, consumers are often confronted with elected leaders, who still have the tendency to consider themselves as being their sole legitimate representatives and therefore obstruct autonomous expression of consumer associations. It should also be added that due to the municipal or inter-municipal level of organisation-regulation, local public services are the only ones not to have experienced the phenomenon of nation wide balancing of tariffs⁸.

The development of local consumer associations protesting against the rise of the price of water or working on the stakes of its quality, should also be emphasised. These associations have often put up cases against concessionary firms which have in most cases led to the condemnation of the firms in question (see also point 3.3) . It is striking to note how such small associations having at their disposal only very little means, manage to put into difficulty big international groups.

Regarding main financial flows in the water service one can briefly mention the following process: municipalities either negotiate water price with companies during the delegation contract, or else establish the price themselves (also through syndicates) if they are organized in *régies*. The price of water integrates water fees:

one part goes to river basin agencies (redevances “*preservation de la resource*” et “*lutte contre la pollution*”), that in turn gives financial support to municipalities for drinking water and wastewater infrastructures.

⁸ Prices and tariffs are not determined at national level as water services are local, and differ from one municipality to another. The main differences in water prices can be explained by the following elements: the existence of collective sanitation, the size of the municipality, the type of management, and the characteristics of raw water withdrawn (underground water is much better quality than surface water, and demands less treatment to be drinkable).



Table 2-2: Overview of charges regarding water and wastewater management

Charges	Who pays?	Who collects?	Amount collected	Use of revenue
Abstraction charge (<i>redevance "preservation de la resource"</i>)	Water users (industries, municipalities, water operators and irrigigators)	River Basin Authorities (Agences de l'eau)	1 500 million €/year	Subsidies to private and public actors for activities of restoration of water resources, control and maintenance of water resources (representing 35-50% of investments)
Pollution charges (<i>redevance "pollution "</i>)	Municipalities of more than 400 inhabitants and industries (based on measures or estimated quantity of substances discharged)	River Basin Authorities (Agences de l'eau)	7 000 million €/year	Subsidies to régies, municipalities and private operators for protection parameters, sewerage network, sewage sludge management, collective and individual wastewater treatment facilities, drinking water infrastructure (30-50% of amount of investments)
Occupation charge ⁹ (<i>redevance d'occupation</i>)	Private water operators	Municipalities	–	–
Tax for navigable waters (<i>taxe VNF</i>)	Municipalities that abstract water from navigable waters	Voies navigables de France	–	Maintenance and improvement of navigable waters
FNE tax (formerly FNDAE tax)	DW users	FNE (<i>Fonds National de l'Eau</i>), managed by the Ministry of Agriculture	144 826 566 €/year	Helps especially small-sized municipalities to construct drinking water and waste water infrastructure
Sanitation charge (<i>redevance assainissement</i>)	Users connected or connectable to a sanitation service (according to water consumed)	Municipalities	–	Revenue pays the service of collection, transport and treatment of wastewater and must be established (compulsory) by municipalities that provide this service in order to cover investments (balance their budget regarding sanitation), and pay the operator (in case this service is delegated).

⁹ Initially, underground canalisation is considered as a private occupation of the public domain (unless canalisation belongs to municipalities): therefore the payment of this charge represents the financial counterpart that local communities must receive as the owners of the public domain. This charge is paid by private operators but not municipalities that manage their own water distribution service.

The other fee goes to a fund named the FNE¹⁰ (*Fonds National de l'Eau* - National Water Fund): it is managed by the Ministry of Agriculture and helps especially small-sized municipalities to construct drinking water and waste water infrastructure.

Table 2-2 gives an overview of the different charges regarding water and wastewater management in order to clarify who pays, and how the revenues of the charges are used.

Cost recovery is organized on the principle that all financial resources come from consumers' contributions: the water price pays water. The water bill is structured in the following way in 2000 (these percentages representing averages for the whole of France) (see Table 2-3).

Table 2-3: Structure of the water bill (in 2000)

Water production and distribution	42%
Wastewater collection and treatment	31%
River basin agencies charges (<i>poll° and abstract° charges</i>)	20%
FNE charge	1%
VNF charge	0.5%
VAT (value added tax)	5.5%

Source: FNCCR, 2001

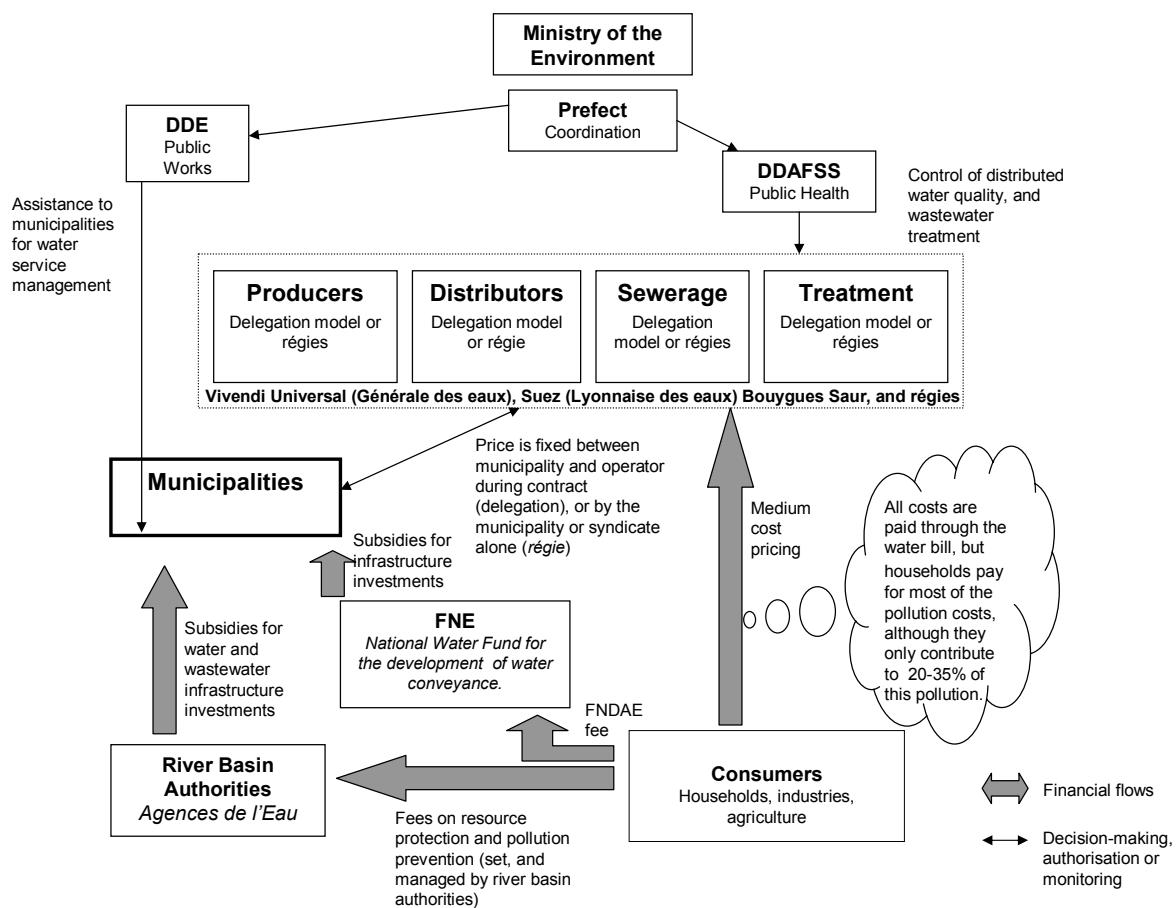
However, one can mention that not all actors pay the corresponding price of their pollution, which therefore means that full cost recovery is incomplete. Regarding the pollution fee that goes to the River Basin agencies, households pay 80% of the pollution fee, but only contribute to 20-35% of this pollution; farmers that are at the origin of at least three quarters of nitrate pollution and a third of organic matter pollution only contribute to 1% of the revenues of this fee.

The following graphic sums up the main actors in the French water sector (see Figure 2-2).

¹⁰ FNE was formerly named the FNDAE (*Fonds National pour le Développement des Adductions d'Eau* - National Fund for the development of water conveyance). It was created in 1954.



Figure 2-2: Organization of Water Actors in France



2.3. SYNCHRONIC ANALYSIS OF THE CURRENT LEGISLATION

2.3.1. Resource Access

2.3.1.1. Property rights on the water resource

The legal regime of water property rights in France is quite complex and can be explicated as follows (Sangaré and Larrue, 2001, pp. 16-17):

Running water (rivers, ...) cannot be owned (publicly or privately): it is no one's property, and has therefore the status of *res nullius*. Only the bed has a clearly defined status. For riverside owners who also own the river beds, privately-owned watercourses are merely subject to user rights. For state-owned watercourses, these user rights belong to the State, and they are defined in the Public River Property Code.

The state has predominant rights to *beds of state-owned watercourses*, state-built canals, and lakes through which state-owned watercourses flow;

There is recognition of private property rights related to ownership of the land for spring water, rain water, privately-owned river beds, most canals, some ponds and *groundwater*. Since the law of 1992, most abstraction of ground water is subject to authorisation and declaration.

Regarding spring water, the private appropriation of spring water is a right linked to land ownership. Article 642 of the Civil Code gives the person with a spring on his land the right to use this water freely, within the limits and for the needs of his family (under a consumption of 40m³/day). The right of disposal cannot be effected to the detriment of the general interest, for example by removing any necessary and indispensable water from the inhabitants of an area (article 642, paragraph 3 of the Civil Code). For uses that could represent a threat for water resource availability (over 40m³/day), an authorisation or declaration procedure is necessary.



The non-domestic use of water is subject to particular restrictions: any water abstraction from the environment (aimed for the public interest of the community) requires prior authorisation by the prefect.

2.3.1.2. *Public Policies on the resource*

Legislation in force

Civil Code

Decree-Law of the 8th August 1936 on the protection of groundwater 1964 Water Law

Law of the 19th July 1976 on *installations classées* (classified firms) and their discharges in water Water law n° 92-3 of the 3rd of January 1992

Decree n° 93-1038 relative to nitrate pollution from agriculture

Decree n°1996 of the 4th of March regarding manure spreading

Objective: Protect water resources that can be used for the production and distribution of drinking water.

Instruments: -*Prescriptive instruments*- As mentioned before, the non-domestic use of water is subject to particular restrictions: any water abstraction from the environment (aimed for the public interest of the community) requires prior authorisation by the prefect¹¹: a legal text is established (an *arrêté préfectoral*- Order of the prefect) after the agreement of the departmental Council of Hygiene (*Conseil Départemental d'Hygiène*). The legal text fixes the conditions of use and protection of the catchments. Moreover, regarding industries representing a particular risk to the environment (named *installations classées*) must be authorized by order of the prefect, that gives his consent if the industry has sufficient preventive infrastructure (waste disposal equipment, proper protection of water resources in case of accidental pollution, and regular monitoring of underground water for potentially dangerous activities). Moreover, any activities and works that could have potential effects (reduction of resource availability, flooding risks) on water must be declared and authorized.

Protection parameters are established around water catchments. Three parameters must be established. The first perimeter (*périmètre de protection immédiate*) is set up to stop direct

¹¹ Authorisation is needed for water abstraction that is higher than 80m³/hour. Declaration procedure is needed for abstraction quantities of less than 80m³/hour.



contamination by substances around the catchment area, and must be delimited by a fence. The second perimeter (*périmètre de protection rapprochée*) must protect water catchments from accidental pollution sources (industries...). The third perimeter (*périmètre de protection éloignée*) is a perimeter of observation in which activities are less restricted.

Activities (industry, farming activities) around the catchment areas can be prohibited, or more severely controlled. The municipality can even expropriate land in order to have the ownership of the area around the water catchment. The 1992 Water law has fixed a five year delay for the implementation of protection parameters around water catchments in all of France.

Regarding economic instruments, the setting up of pipes and connections in the underground of the national public domain is charged: water companies must pay an occupation charge (*redevance d'occupation*) to municipalities. An abstraction charge (*redevance "préservation de la resource"*) is paid by water consumers through the water bill. A pollution charge¹² is also paid by water users in all municipalities over 400 inhabitants. The revenue (for both abstraction and pollution charges) goes to the River Basin Authorities that give subsidies to municipalities notably concerning the implementation of protection parameters (that can go up to 60% of expenditures) and other water infrastructure. The price of water also includes a tax for navigable waters (*taxe VNF- Voies navigables de France*) for all municipalities that abstract water from navigable waters. The revenues go to a public establishment named *Voies Navigables de France* and used for the maintenance or improvement of navigable waters.

As far as nitrate pollution is concerned, minimum distances are imposed for manure spreading so as to protect water resources. A programme was launched from 1993 onwards to encourage farmers to conform to legislation: subsidies were given for proper manure management (sufficient landfilling infrastructure, manure treatment facilities...) through a national plan (*PMPAO: Programme de Maîtrise de Pollutions d'Origine Agricole*).

Target groups: Water producers, farmers and industries located in the protection perimeter.

¹² The charge is calculated by multiplying the quantity of pollution (generated by each inhabitant) by a coefficient (which depends on the number of inhabitants and collection constraints).



Actors of implementation: Prefects, DDAFSS, DRIRE (for control of industries), Inspection des Installations Classées (for the control of industries), municipalities.

Action logic: If we regulate water abstraction and limit punctual and diffuse pollution sources, then we guarantee safe drinking water.

Effects: Regarding water abstraction authorizations, these are given systematically to water users, as there is an increasing number of abstraction points to be dealt with (several thousands of groundwater abstractions points are authorized every year): this means that there is no proper control of resource use. In 2001, one can count 35 171 catchment areas for drinking water. But out of these areas, only 12 786 had protection parameters. This means that only 35.3% of water catchments destined to drinking water are sufficiently protected, which is well under the implementation objective fixed by the 1992 Water law. There are still 22 800 catchments that are not provided with protection parameters. Municipalities are not inclined to properly implement these protection parameters as they suppose the restriction of industrial and agricultural activities. The cost to conform to these requirements is also quite high (around 4 573 to 76 225 euros for every water catchment). This results in the closing up of many over-polluted catchments each year: in 1997 for example in 18 *départements* of the *Loire Bretagne* Basin, 55 catchments were closed; in the *Seine-Normandie* Basin, 443 catchments were abandoned over a total of 5000 catchments, mostly due to nitrate pollution. Agricultural pollution sources (nitrates and pesticides) have not been sufficiently regulated around water catchments, and these represent the main reasons for the closing up of water catchments. The programme which was meant to change and improve agricultural practices has not at all been implemented: subsidies have been given to help farmers conform to legislation, but the results on nitrate pollution are practically nonexistent, as repressive (fines, and other sanctions) measures against poor manure management are not at all put into practice by public authorities. The European Commission has sent a last warning (before fining) to France regarding the situation of nitrate pollution: the quality of rivers in the Brittany region are considered as insufficient, and measures regarding pollution are deemed too punctual and general.



Water police in France represents more than 500 different services, and most of the latter control and are also advisors of the activities that they control, which leads to a certain confusion in the police role of these services, and a lack of independence.

2.3.2. Water production

Legislation in force

Decree n° 89-3 relative to water intended for human consumption

Law of the 6th February 1992 relative to the territorial administration of the Republic (*loi ATR*)

1993 Law (*Loi Sapin*) of 29 January relative to the prevention of corruption

Law of the 2nd February 1995 relative to the protection of the environment

Decree of the 26th May 1997 relative to material used in water production and distribution

Decree n° 2001-1220 relative to water intended for human consumption

Law of the 6th February 2002 on proximity democracy (*démocratie de proximité*)

Objective: The aim is to limit pollution upstream from agriculture (nitrates from excess manure and pig slurry) and industry and have sufficient infrastructure and safe techniques to produce good quality drinking water.

Instruments: -*Prescriptions*- Any product used in the treatment of drinking water must respect concentration limits fixed by regulation, and must not represent any danger to human health. The use of products and treatment processes must be authorized by the Ministry of Health, after the opinion of the Food Safety Agency (named AFSSA¹³, *Agence Française de Sécurité Sanitaire des Aliments*). Moreover, the materials used for water treatment infrastructure must not alter the quality of water produced. Their use is also submitted to prior authorization of the Ministry of Health, after the opinion of the Food Safety Agency. Minimum quality standards are imposed on surface waters before being used in the production of drinking water.

Regarding delegation contracts, competition is imposed: every municipality that intends to delegate the service must set up an invitation to tender. Delegation contracts cannot last more

¹³ This institution is under the tutorship of 3 Ministries: the ministries of Health, Agriculture and Finance. Its role is to evaluate and prevent risks linked to the production and distribution of food.



than 20 years (except for special derogations). As far as intercommunal management of water is concerned, local consultative commissions must be set up¹⁴ in order to increase information to inhabitants on the quality and price of water, and develop public participation (associations of users are integrated in these commissions)¹⁵.

Subsidies are given through the FNE (at *département* level) and Basin Agencies (see pages 13 and 14). *Départements*, regions and EU can also contribute to subsidizing part of the investments¹⁶.

Self regulation : any operator contributing to the production infrastructure must check with suppliers that the material is conform to human safety. Municipalities/private companies that manage the production of water are responsible for the control of water quality.

Target groups: water producers, farmers and industries (see point 3.1.2)

Actors of implementation: Ministry of Environment, Ministry of Health, AFSSA, mayors, prefects

Action logic: If we protect water quality upstream and develop proper water treatment infrastructure, then we provide good quality and safe drinking water.

Effects: Regarding the protection of water upstream, see point 3.1.2

In France 63% of water produced comes from underground water, and 37% from surface water (this concerns usually towns of over 20 000 inhabitants). Underground water usually only needs disinfection treatment, whereas surface water needs more complex and costly treatments. According to Miquel (2003), there is a lack of control of production units, which increases microbiological risks. Moreover, 10% of production units do not sufficiently control water turbidity (jeopardizing water safety). When production units are not in conformity with

¹⁴ This is compulsory for municipalities of over 10 000 inhabitants.

¹⁵ These measures regarding water management concern all water and wastewater services, and apply for the following steps of the water cycle. In order not to repeat ourselves, we shall not mention these measures in the following points.

¹⁶ However, we do not have any precise data on the amount of subsidies given by regions, départements and EU for the different investments in water infrastructure. These vary a lot from one area to another, and therefore reports on management of water in France do not provide any precise data. This is therefore unfortunately also true for the other sub-sectors studied (water distribution, sewerage, wastewater treatment) in this report.



the law, prefects do not close units but only prohibit water consumption for some time. Mayors prefer also to prohibit temporarily the units than invest in costly infrastructure. Few local consultative commissions have been set up.

2.3.3. Water distribution

Legislation in force

Decree n° 89-3 relative to water intended for human consumption

Water law n° 92-3 of the 3rd of January 1992

1993 Law (*Loi Sapin*) of 29 January relative to the prevention of corruption

Law of the 2nd February 1995 relative to the protection of the environment

Decree of the 26th May 1997 relative to material used in water production and distribution

Code of territorial communities (*Code Général des Collectivités Territoriales*)

National Convention on Water Solidarity (28th April 2000)

Decree n° 2001-1220 relative to water intended for human consumption

Law of the 6th February 2002 on proximity democracy (*démocratie de proximité*)

Objectives: The main aim is to provide good quality drinking water, respecting minimum health standards. Water supply must also respect public service principles of access to all, continuity, quality and transparency.

Instruments: *Prescriptions-* Microbiological, chemical and indicative parameters have been fixed (Decree n° 2001-1220) in application of the EU directive 98/83 on drinking water. Water distribution networks must be cleaned and disinfected so as not to represent any threat for human health.– *Self regulation-* The municipality or private operator in charge of water distribution must continually control the quality of water provided at different points of the water treatment and distribution process, according to the specific risks identified in the infrastructure. Quality monitoring is not only imposed at the end of the drinking water treatment plant process, but also at the tap. This enables to find the cause of a possible contamination (due to insufficient treatment, or to pipes, or to reservoirs) and to delimit the responsibility of each actor (municipality, water company, building). The DDAFSS or agents of a certified laboratory do the sampling of water, and the analyses are elaborated by laboratories that have been certified by the Ministry of Health. The costs are borne by the

public or private water distributor. Private or public entities responsible for the distribution units must provide (for a size of over 3 500 inhabitants) an account on the state of the distribution system (control and works) to the prefect.

The water supply service is considered as an industrial and commercial public service (*service public à caractère industriel et commercial*): it must have a separate budget (water and wastewater services must be organized in separate budgets except for municipalities below 3 000 inhabitants) enabling to determine the cost of the service and ensure its balance. The price of the service must correspond to the investment and running costs of the service, including the remuneration of the private company (in the case of a delegation contract): water pays water through the water bill.

When health parameters are not respected, the distributor must inform the mayor and Prefect, and corrective measures must be taken in order to comply with standards. If the prefect assumes that the quality of water can represent serious health problems, he can take all measures necessary to interrupt or restrict water use. Consumers must then be immediately informed.

Economic instruments: Regarding water charges, a binomial tariff is applied. The latter is based on a fixed amount independent of consumption¹⁷ (this fixed amount is usually set up in the majority of cases, but is not compulsory) and a proportional amount based on consumption, which enables a better use of drinking water. In the case of *régies*, these tariffs are fixed each year after having been deliberated over in the town council. Regarding delegation contracts, they are fixed during the establishment of the contract (the evolution of prices is also specified). Added to this tariff are the charges that are collected by the FNE, the Basin Authorities and the VNF (see pages 12 and 13).

Subsidies: An important part of investments in water supply infrastructure can be covered by subsidies through Basin authorities and the FNE (30 to 50%). *Départements*, regions and EU can also contribute to subsidizing part of the investments.

¹⁷ This fixed amount must strictly correspond to fixed charges of the service, such as the maintenance of pipes.

Social fund: solidarity funds have been created by a national convention on water solidarity (Charte nationale “solidarité eau”) defining concrete measures enabling the continuity and availability of water services for disadvantaged people. Conventions at departmental level can be established between prefects, water distributors (who can engage themselves in not cutting water supply for unpaid water) and municipalities. This can enable disadvantaged people to receive financial support to help them pay their water bills (support is financed through the water bill).

Information: The analyses of water quality, commented by the DDAFSS, are in the hands of the prefect who in turn gives this information on the quality of water distributed to the mayor. The latter must display all the documents sent by the prefect in the town hall, so that all citizens be informed about the water quality. The mayor must also present an annual report on the price and quality of water in all municipalities over 3 500 inhabitants. Operators must also give a report every year giving information on the execution of the delegation contract : this can be consulted by the public 15 days after having been received by the town hall.

Target groups: water distributors, subscribers to water services, municipalities (price determination), disadvantaged households.

Actors of implementation: Government, Ministry of health (DDAFSS), water distributors, municipalities (mayor), prefects.

Action logic: If we set stringent standards and rationalize water use, then we can guarantee good water quality access to all.

Effects: Although we cannot evaluate the effects of the new decree n° 2001-1220 on drinking water quality (applying the directive 98/83/EEC which will replace the former 80/778/EEC directive from the 25th December 2003)¹⁸, one can already assess the application of the former 1989 decree. Up to now, water quality supplied is generally of good quality and respects the quality standards. Drinking water is distributed through distribution networks to 99% of the population. According to the Ministry of Health data basis, conformity to microbiological parameters in France has improved: in 1991, 80% of water distributed was conform to

¹⁸ The cost of conformity to this new decree amounts to around 4.5 milliard euros. (out of which 3.5 is for lead)



microbiological parameters, whereas in October 2001, this percentage rose to 89.6%. In 1998, 2% of water distributed is over the 50mg/l limit for nitrates, and 6% over the pesticides limit of 0.1 µg/l. Regarding solidarity funds, unpaid water bills supported by the social funds only represent 1/1000th of the water bill. Information on the possibility to benefit from these funds is not sufficiently provided to disadvantaged people (Billard and al., 2001).

According to the *Assemblée Générale des Canaliseurs de France*, the state of distribution networks is quite alarming: around 28% of water distributed was lost through pipe bursts or leakages in 1999.

One notable fact is that users only use 1% of their drinking water for drinking purposes, and consume more and more drinking water bottles. This situation is seen as a lack of confidence in water quality and safety, due also to the different sanitary crises in France that have shown a lack of control done by public authorities. An interesting example of consumer discontent regarding water quality and shared responsibility between water companies and government (because of bad implementation of the nitrates directive) is given in the following box:

Box 2-2: Consumer discontent in Guinguamp (Brittany)

In 1995, 176 water consumers in *Guinguamp* lodged a complaint supported by the association *Eau pure* against the water distributor *Lyonnaise des Eaux* for having supplied water that was over the threshold of 50mg/l of nitrates during 247 days between 1992 and 1994. The company is then condemned in December 1995 to indemnify these consumers: every consumer was given 1200 francs (184 euros), based on the consumption of water bottles during the given period. The company also supplied the *Guinguamp* population with a fountain of drinking water (which cost 107 600 euros/year).

After this condemnation, *Lyonnaise des Eaux* brought an action in January 1997 against the State, as it considers having its reputation tarnished, and having been wrongly condemned as the real responsible is the State. The company considers that the latter is responsible for the nitrate pollution in *Guinguamp*: 1) it did not sufficiently control and condemn the over-development of husbandry in the region, and control proper slurry management; 2) it did not respect the transposition delay of the 1991 European nitrate directive, giving France two years to transpose the directive in national law: France did this only in March 1996. In May 2001, the *Tribunal administratif* (tribunal dealing with internal disputes in the French civil service) of *Rennes* condemned the State to compensate the company (80 000 euros) for moral wrong.



2.3.4. Sewerage

Legislation in force

Water law n° 92-3 of the 3rd of January 1992

Decree n° 94-469 of the 3rd of June 1994 on the collection and treatment of wastewater

Orders of the 22nd of December 1994 on collective sanitation

Orders of the 6th of May 1996 on individual sanitation

Code of territorial communities (Code Général des Collectivités Territoriales)

Objective: Develop wastewater collection and treatment all over the territory and avoid wastewater discharges in sewerage.

Instruments: -Prescriptions- Sewage collection and treatment is planned at municipal level¹⁹. The municipality plans zones in which collective and individual sanitation must be established. Different prescriptions exist according to the size of the urban area: collective sewerage is compulsory for urban areas above 2000 p.e. Above 15 000 p.e., urban areas must be equipped with sewers and main sewers by end 2000 (same for urban areas between 2000 and 15 000 p.e. by the end of 2005). In less populated areas (below 2000 p.e.), individual water treatment is privileged. Municipalities must ensure the control of individual treatment infrastructure through an organism named the SPANC²⁰ (Service Public de Contrôle des Dispositifs d'Assainissement Non Collectif) that must be established before the end of 2005.

Restrictions to discharges in sewers : municipalities deliver authorizations to industries and define the conditions of discharges in sewers (characteristics of effluents, and means to follow-up these effluents). This authorisation can be completed by a convention that fixes the

¹⁹ Let us note that regarding sewerage networks maintenance and development, delegation is also common (see page 9).

²⁰ The SPANC is an industrial and commercial public service, that is financed by fees coming from all users benefiting from the service of individual sanitation (and not the entire community).



industry's commitments²¹ and the responsibilities of the municipality and the industry. Sector-based standards for industrial discharges in public sewers are fixed²².

When the collective treatment plants enter into operation, direct domestic discharges must go in the sewers. Clear water must not be linked to wastewater (through infiltration or leakages).

-*Economic instruments*- A sanitation charge (*redevance d'assainissement*) is fixed by municipalities, and paid by all users connected or connectable to a sanitation service. The revenue pays the service of wastewater collection, transport and treatment²³ (see also page 13).

-*Subsidies*- the Basin Agencies and FNE (at *département* level) give subsidies for sanitation works and their running (35-50%). Départements, regions and EU funds can also give subsidies²⁴. One must note that no specific subsidy is granted for the separation of wastewater and rain water, and this can be difficult for municipalities facing important investments (Cour des Comptes, 1997).

-*Assistance*- Départements provide assistance through SATESE (*Services d'Assistance Technique à l'Exploitation des Stations d'Epuration*) which are assistance services that help municipalities manage their wastewater systems.

-*Information*- The annual report that the mayor must present in all municipalities over 3 500 inhabitants (see water distribution) concerns also information on sanitation.

Target groups: municipalities, owners of houses (to be connected to sewage networks), industries

²¹ Regarding the pollution fee (*redevance pollution*) that goes to the *Agences de l'eau*, this fee paid by industries varies according to the pollution produced and treated prior discharge.

²² Regarding the quality of sewage network, the separation of wastewater and rain water is not compulsory, but is encouraged in order to avoid punctual saturation of wastewater facilities. Rules on rain water management are established by departmental rules (*Règlements Sanitaires Départementaux*).

²³ This charge will not be mentioned in the following section on wastewater treatment although it also applies to wastewater treatment, in order to avoid repetitions.

²⁴ Here again, no data was available on exact sums granted by departments regions and EU.

Actors of implementation: municipalities, Prefects, DDAF (*directions départementales de l'agriculture et de la forêt*), DDAFSS (Directions Départementales des Affaires Sanitaires et Sociales), *Inspection des Installations Classées* (water police regarding industries)

Action logic : The planning of the development of sewage networks and wastewater treatment plants will enable to guarantee a better management of wastewater, and therefore enable a better quality of water resources and drinking water.

Effects: Most of the population is connected to a collective sewage network, representing 78.8% of the population in 1999.

Table 2-4: The state of sewage networks in France

	Millions of inhabitants	% of French population
Population connected to a sewage network	46.1	78.8%
Population equipped with individual sanitation	11.1	19%
Population with no connection or individual sanitation	1.3	2.2%

Source: IFEN, SCEES, Agences de l'Eau, INSEE, 1999

In towns of over 10 000 inhabitants, most housings are connected to sewage networks. This is not only due to the implementation of the EU directive, but also efforts done since 1975 with a connection growth rate of around 4% per year (this growth is now of around 4.5% per year). However, there is room for improvement for small municipalities: around 4000 of them do not have any sewage network or individual treatment, which means that wastewater is thrown directly into water resources. Apart from that, the separation of wastewater and rainwater has developed: 40% of the network has a separate system, one third has no separation, and 30% has a mixed system: a network for wastewater already existed, but then another network for rainwater was also added (this was done in municipalities of over 10 000 inhabitants).



2.3.5. *Wastewater treatment*

Legislation in force

Water law n° 92-3 of the 3rd of January 1992

Law n° 92-646 of the 13th of July 1992 on waste management

Decree n° 94-469 of the 3rd of June 1994 on the collection and treatment of wastewater

Orders of the 22nd of December 1994 on collective sanitation

Orders of the 6th of May 1996 on individual sanitation

Code of territorial communities (Code Général des Collectivités Territoriales)

Order of the 21st of June 1996 on technical prescriptions for small wastewater facilities

Decree n° 97-1133 on sewage sludge spreading

Order of the 8th January 1998 on sewage sludge spreading

Objective: Provide wastewater treatment according to EU requirements given the delays and ensure a better management of sewage sludge (with a priority given to agricultural use).

Instruments: -*Prescriptions*- By the 31st of December 2000, secondary treatment must be provided for wastewater (collected through a collective sewage network) in urban areas of over 15 000 p.e, and by the 31st of December 2005, secondary treatment must be provided for wastewater (collected through a collective sewage network) in urban areas between 2 000 and 15 000 p.e. Under 2000 p.e. an autonomous sewage regime is applicable (individual treatment system) by 2010. In sensitive areas, tertiary treatment is necessary before wastewater can be discharged for urban areas of over 10 000 p.e.

Sensitive areas (in which case advanced wastewater treatment is necessary), less sensitive areas (for which primary treatment is sufficient) and normal zones (secondary treatment) have to be determined by the 31st of December 1993. Treatment plants can work only after wastewater that entered and comes out of the plant has been sampled, controlled and is conform to quality standards.

Regarding sewage sludge management, stricter standards are imposed on sewage sludge spreading in agriculture. Moreover, in France, landfilling will be prohibited for sewage sludge: the law n°92-646 restricts landfilling to *ultimate waste*²⁵

Self regulation of discharges from wastewater treatment plants is established as follows: each operator is responsible for establishing a system of self regulation of the facilities. The results are then given each month to the water police service (DDAF, DDE or navigation services) and the Basin Agency.

-*Information*- Operators must give a report every year giving information on the execution of the delegation contract: this can be consulted by the public 15 days after having been received by the town hall. A report of the sanitation system is done by the mayor and available to the public.

-*Subsidies*- Same as for sewage networks. Moreover, the basin agencies promote good wastewater treatment by giving bonuses according to the quality of treatment and sewage sludge produced. Départements and regions and EU funds can also give subsidies.

Target groups: municipalities (responsible for the wastewater collection and treatment), households, industries, wastewater treatment operators

Actors of implementation: DDE, DDAF, navigation services, Prefect, Basin Agencies, municipality (mayor)

Action logic: The development of wastewater treatment plants and sewage sludge management will enable to guarantee a better management of wastewater, and therefore enable a better quality of water resources and drinking water.

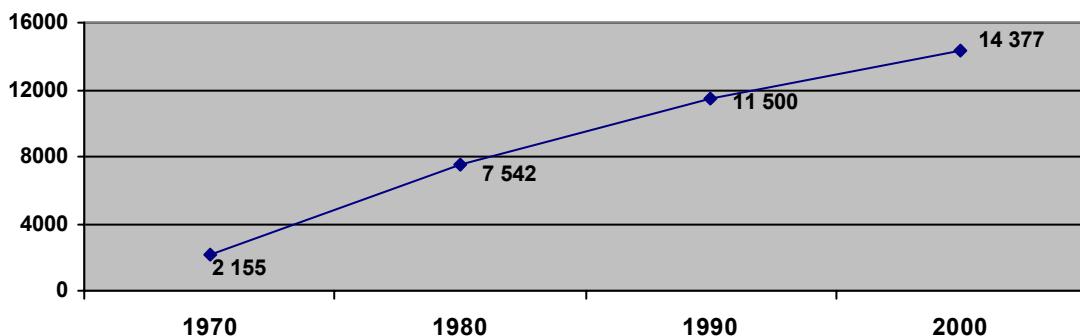
Effects: Regarding sensitive areas, France officially drew up its first list in November 1994 for all three different areas (less sensitive, normal, sensitive). It reviewed its list in 1999, adding a number of sensitive areas. However, the European Commission complained that the

²⁵ Ultimate waste is a typically French concept. This type of waste includes any waste, resulting (or not) from former treatment, which is not likely to be recovered, *given the technical and economical conditions of the moment*. Recovery includes recycling, agricultural use, and incineration with energy recovery (Buclet and al., 2000).



French authorities have not indicated the criteria used for the establishment of these sensitive areas. 281 agglomerations of over 10 000 p.e. exist in these zones, out of which 130 were not in conformity with the provisions of the directive to be met by end of the year 1998. The Commission also indicates that some other sensitive areas should be defined, notable in the Artois-Picardie basin, the bay of the Seine and the Brittany region. In April 1999, the Minister of the Environment stated that only 38% of the agglomerations in sensitive areas would meet the 1998 deadline. 27% would be up to 3 years behind, and 35% would need more than four years to meet requirements (E.C., 2002).

Figure 2-3: Evolution of the number of urban wastewater treatment facilities²⁶



As far as wastewater treatment is concerned, the number of wastewater treatment facilities has increased significantly (see Figure 2-3): This figure draws attention to the fact that wastewater treatment facilities developed long before the implementation of the 1991 EU directive, and shows that in 30 years, the number of facilities has been multiplied by seven. What the graphic does not show is the qualitative change linked to the implementation of EU requirements, leading to a renewal of 20% of the facilities. However, there is an important need for further improvement of wastewater treatment in France. Out of the total of 36 600 municipalities, 19 300 have a sanitation service (corresponding to 55 million inhabitants, representing 59% of the population), and 13 100 municipalities (mostly small) do not have any sanitation service (neither collection nor treatment of wastewater), representing 7% of the

²⁶ Graphic done by S. Lupton, based on data from Miquel (2003).

population. Nonetheless, treatment problems are not only specifically linked to small municipalities. Some large cities such as Lille, Marseille and Bordeaux (of over 150 000 p.e.) have very inadequate treatment, that consists in either primary or incomplete secondary treatment (E.C, 2002).

Regarding sewage sludge management, France has two major choices for sewage sludge management: incineration and agricultural use. At present, France produces around 850 000 tons of dry solids (DS) per year, out of which a little more than 60% is used in agriculture, 15% is incinerated and 25% is landfilled (this option will be prohibited in the near future). Land spreading is therefore an important recovery mode for sewage sludge in France, and is above the European average (40% of sludge is landfilled)²⁷. However, this recovery option is put into question. A debate on the safety of sewage sludge spreading emerged after 1995, with the increasing concern of food safety, notably perturbed by the mad cow disease crisis and the debates on the health and environmental effects of GMOs (Genetically Modified Organisms). One of the main reasons that farmers are reluctant to accepting sewage sludge is the growing restrictions of the food sector: food industry, co-operatives, mass marketing impose stricter requirements than the French legislation on sewage spreading. The position of these groups regarding sewage sludge is often based on a total refusal of sewage sludge, without any scientific or economic justification. This co-existence of the French legislation and private can destabilise farmers' anticipations on the evolution of standards. Farmers will be reluctant to spread sewage sludge, if they are not reassured that all actors agree on sewage sludge spreading, and that their products will not be refused at any moment by co-operatives. As for the moment, there is no agreement between government, farmers, food industries and mass marketing on an acceptance of sewage sludge spreading under certain safety conditions, farmers fear that accepting sludge now, even if the quality and spreading practices respect public standards, may later represent a refusal of their crops (Lupton, 2001, 2002).

²⁷ The main reason for the importance of sewage sludge spreading is the cost of this option compared to incineration.

2.3.6. *Synthesis*

France's water sector has been largely influenced by EU regulation concerning quality standards, wastewater treatment infrastructure and sewage sludge quality requirements.

2.3.6.1. *Synthesis table*

Regarding drinking water supply, France is in quite a good position with 99% of the population supplied with a drinking water service. Drinking water quality is generally satisfactory, but small municipalities still face difficulties to comply to standards (problem with disinfection treatment for example). As we mentioned previously, the water police structure in France is highly complex, as different services do different water police according to the departments, and the actual monitoring and sanctions for non compliance are not well applied, which can partly explain why the situation of France's water resource protection is quite preoccupying. As regards wastewater collection and treatment, the outcome is not as good as for drinking water with 7% of the population that does not have any sanitation service (neither collection nor treatment of wastewater). One can note a greater effort to improve public participation at municipal level, with the compulsory creation of consultative commissions that ensure that public interests are respected. However, few have been set up for the mean time.

Table 2-5 sums up the characteristic features of the different sectors of the water sector.



Table 2-5: Synthesis France's water sector

Water cycle Public policy	OBJECTIVES	INSTRUMENTS	TARGET GROUPS	ACTORS OF IMPLEMENTATION	EFFECTS
1. Resource access	Protect water resources (potential drinking water)	<p><i>Pr.</i> Authorizations by the Prefect are needed for water abstraction; protection parameters are established around water catchments, activities around catchments can be prohibited.</p> <p><i>Eco.</i> Water companies must pay an occupat° charge to municipalities; a pollut° charge is paid by water users (households and industries), whose revenue goes to the Basin Agencies. A tax of navigable waters is also paid by users in municipalities that abstract water from navigable waters.</p>	Water producers, residents, farmers and industries located in the protection parameter	Prefects, DDASS, DRIRE, Inspection des Installations Classées, municipalities	Poor control of resource use Only 35% of water catchments have protection parameters
2. Production	Limit pollution upstream from agriculture and industry and have sufficient infrastructure to produce good quality drinking water.	<p><i>Pr</i> Any product used for the treatment of water must respect concentrat° limits and represent no harm for human safety. The use of products must be authorized by the Ministry of Health.; every municipality that intends to delegate must set up an invitat° to tender.</p> <p><i>Sub.</i> through the FNE (at département level) and Basin Agencies</p> <p><i>Self reg.</i> Municipalities/operators are responsible for the control of water quality. <i>Info:</i> annual report on execut° of contract by operators.</p>	Water producers, farmers, industries	Ministry of Environment, Ministry of Health, AFSSA, mayors, prefects	Lack of control of production units
3. Distribution	Provide good quality drinking water, respecting minimum health standards.	<p><i>Pr.</i> Fixed parameters on water quality</p> <p><i>Self reg.</i> Quality controls at different stages of prod° and distrib° (including at the tap)</p> <p><i>Eco.</i> water prices based on binomial tariff;</p> <p><i>Social funds</i> exist ("solidarity funds") for access to the poor.</p> <p><i>Sub.</i> through the FNE (at département level) and Basin Agencies</p> <p><i>Info.</i> Mayor must inform on water quality to citizens (+annual report on the execut° of contract by operators).</p>	Water distributors, subscribers, municipalities (price setting), disadvantaged households	Government, Ministry of Health, water distributors, municipalities (mayor), prefects.	Quality parameters have been fixed Good quality water in general Distribution to 99% of the population
4. Sewerage	Develop wastewater collection and treatment all over the territory.	<p><i>Pr.</i> Development of sewage collection systems for p.e. above 2000. Restrict° imposed on discharges and on dangerous substances. <i>Sub.</i> . through the FNE (at département level) and Basin Agencies.</p> <p><i>Eco:</i> Sanitation charge set and collected by municipalities.</p> <p><i>Info.</i> Operators must give an annual report on the execution of the contract, consultable by the public.</p>	Municipalities, houses to be connected to sewage network, industries	Municipalities, prefects, DDA, DDASS, Inspection des Installations Classées	78.8% of population is connected to sewers
5. Treatment	Provide wastewater treatment according to EU requirements and ensure a better managt of sewage sludge.	<p><i>Pr.</i> Secondary treatmt for wastewater in urban areas over 2000 p.e., sensitive areas must be set up. Stricter standards on sewage sludge.</p> <p><i>Sub.</i> through the FNE (at département level) and Basin Agencies</p> <p><i>Info.</i> Report on sanitation and drinking water system given by mayor. Operators give an annual report on the execut° of the contract.</p>	Municipalities, households, industries, wastewater treatment operators	DDA, DDE, navigation services, prefect, basin agencies, mayors	establishment of sensitive areas 7% of the pop° does not have treatment or wastewater collection.

2.3.6.2. National model

There is obviously a French model of water supply and sanitation management based on an important percentage of delegation contracts (lead by multinational operators), that have also increased with growing technical standards necessitating increasingly complex know-how and important investments that municipalities had difficulties in assuming alone (same case as in Spain). Contrary to Spain, contracts are more regulated. However, despite laws regulating delegation contracts, we have mentioned the difficulty that municipalities face to really control operators (know-how, complexity of bills...). Although contracts can be re-negotiated in a shorter time lag, when this is so, only 5% of contracts change hands, which shows a certain inertia and irreversibility in the actual delegation process (Baert, 1999). Most times when there is a bid, the only offer is the operator in charge of the contract in the past! (Baert, 1999). However, one cannot describe the French model without equally mentioning the importance of public management of water services with the existence of *régies*, that still detain 47% of the population served for wastewater treatment and 21% for drinking water (although the latter percentage has significantly decreased in the past years). The French model is also characterised by insufficient pollution fees paid by farmers, and important costs are borne by households through the water bill.

2.4. FUTURE TRENDS IN WATER PLANNING AND MANAGEMENT

2.4.1. Emerging legislation

A bill regarding the reform of the water law was launched by the left wing government, voted at the *Assemblée Nationale* in the first phase (*première lecture*) in January 2002. In this project, the duration of delegation contracts was to be reduced from a 20 year period to a 12 year period. Moreover, cutting water in households that are unable to pay the water bill was planned to be forbidden. Finally, water bills were planned to be more proportionate to consumption levels.

However, the new government decided not to continue discussing this bill. Instead a new project was launched in 2003. The transposition of the water framework directive was decided in February 2003. The objectives of this directive may be tricky to implement in France,

notably concerning the good ecological status of water resources and catchments. As we noted earlier on, the lack of control and sanctions of water resource pollution will have to deal with so as to conform to the given objectives. The question of cost recovery is still open: by the year 2010, the industrial and agricultural sectors as well as households must participate to cost recovery: for the moment, farmers are not paying the true costs of use and pollution of water (Launay, 2003).

The new government proposed a national debate among different actors on the reform of the water policy, in order to define the main orientations for a future water law that should be proposed to the Parliament in 2004. The debate's aim is mostly focused around the following issues: 1) the application of the water framework directive, which will require financial, legislative, organisational efforts to properly apply the requirements and clarify each actor's responsibilities; 2) the implementation of the decentralisation process that has been decided in France has to be discussed in order to redefine, at least partially, the competencies of each actor. One must note that the role of basin agencies should not be questioned in this debate according to the Ministry of Environment.

Concerning the regulation in water supply and wastewater treatment, the bill on the setting up of a High Council for public services in water and wastewater treatment, which was adopted in the first reading by the National Assembly in January 2002, seems not to have been included in the bills being prepared by the present government.

2.4.2. Overall trends regarding liberalization

2.4.2.1. A strategic use of the concept of public service

The liberalisation path of network services in France must be understood through the following elements:

France has a strong doctrine of public service: from a juridical point of view, the concept of public service developed with the jurisprudence of the Council of State that defined the principles of equality, continuity and adaptability with specific laws coming from common law since the end of the 19th century. Regarding the economic dimension, this concept developed with theories of market failure, natural monopoly, increasing returns, actualisation,

and of marginal cost tariffs. As far as politics, the concept of social control, social pact, model of society, social link, and republic models included also public service principles. This doctrine was put forward to justify at EU level either the maintenance of particular measures within the framework of sector based liberalisation, or even, in some cases, it was used to refuse any liberalisation process whatsoever.

France does not have a unique model of public service. One often mentions public service “à la française” which is a national public service implying State, public monopolies, and a particular status for personnel (like in EDF, *Électricité de France*, for example). However, there is also the model of delegation of public services to private firms, giving birth to world leaders of local services (Vivendi-Veolia, Suez-Lyonnaise-Ondéo, Bouygues-Saur).

In France, competition policy (controlled by the competition Council - *Conseil de la concurrence*) is recent, and represents an abrupt change compared to previous policies that favoured mergers so as to constitute national champions.

National firms in charge of public service missions are those in which the presence and importance of unions is still strong and has an influence on future evolutions.

French public authorities have often (although this is not a national particularity) used European integration to their advantage putting the responsibility of reforms (that they desired) on the latter without assuming them.

During international negotiations (WTO, GATS), France adopted an opportunistic behaviour, accepting or proposing liberalisation in sectors in which there existed national leaders (ex: drinking water, sanitation), or on the contrary, refusing or limiting liberalisation in other sectors.

The position defended by France in European debates, and the French translation of European level decisions are the result of all these elements. Therefore, France has the reputation of using “public service” at EU level according to its interests or those of some firms, and limits the opening of markets to competition to its national territory, but takes advantage of opportunities elsewhere in the world.

2.4.2.2. A more contrasted reality

In practice, in each sector where liberalisation was launched at EU level, France implements such policies, without much enthusiasm. The most significant example is that of the electricity sector. France implemented minimum requirements regarding the opening of markets to competition demanded by EU directives under the control of a regulator (named *Commission de regulation de l'énergie*²⁸) whose independence was conform to requirements. EDF, that has a reputation of protecting its national market and acting as a predator in other European markets, lost 20% of the market of important industrial consumers, whereas in Germany, in which the market was legally 100% open, the change in provider was less pronounced (with a long absence of a specific regulator).

In other sectors, France transposes liberalisation requirements with delay. For postal services, a bill is under discussion at the Parliament and plans to give the responsibility of regulation to the ART²⁹ (independent regulatory authority of telecommunications that exists since 1996), whereas in Italy or Spain, regulation of postal services is integrated in the government (ministries). For the moment *La Poste* covers snail mail, but the poor quality of service suggests that competitors have room to manoeuvre to attract costumers in the future³⁰. Regarding the gas market, the liberalisation of natural gas was slow: France did not apply the gas directive before the deadline of the 10th of August 2000. The directive was only transposed in January 2003 with the law 2003-8.

Regarding rail transport services, the reform of railway faces violent opposition from unions who contest the opening of the market to competition. As for telecommunications, a regulation authority was created (ART). In this sector, the liberalisation process is the most advanced: all activities are open to competition since the 1st of January 2002. Price competition is very high: the former monopoly France Telecom faces many competing companies (Cegetel, Tele 2, 9 Telecom...). However, at the end of the year 2002, France

²⁸ It was formerly named *Commission de regulation de l'électricité*.

²⁹ ART: Autorité de Régulation des Télécommunications

³⁰ Post office counters do not separate financial services (*La Poste* is also a savings bank) from postal ones, leading to endless queues and consumer dissatisfaction. Moreover mail service can be slow and mail losses are too frequent.

Telecom still has 64% of the market for long distance communications, and 80% for local communications³¹.

One can also note that France is a country that uses all possibilities at hand regarding European rules on the financing of public/universal service obligations. France has for example set up an adjustment fund (*fonds de péréquation*) to finance the universal service of telecommunications, and uses subsidies for 64 air lines qualified as belonging to the “public service” category out of 84 for the whole EU.

All in all, the “europeanisation” process has lead France to clarify what it defines as “public service”. The law of February 2000, that transposed the European directive on the liberalisation of the electricity sector, led to the definition, for the first time, of what had previously and vaguely been defined as “public service” regarding electricity provision. One can also mention that European requirements of transparency and proportionality and sector-based liberalisation decisions led to important changes in France, the effects of which still remain to be observed...

On the basis of this analysis of the situation in France, there are a number of major stakes for the coming years.

- how can there be any guarantee that water supply and wastewater treatment meet the emerging criteria, at the European level, in matters of services of general interest (guarantee of access for everyone –“universal service”, economic, social and territorial cohesion, sustainable development)?
- how can the control of private operators be assured and, more generally, that of the oligopoly which they constitute ?
- how can the efficiency of the system be ensured (effective competition between operators, comparative evaluation between direct management and delegation contracts, effectiveness of the subsequent reversibility of the choice of the method of management)?
- in more general terms, which method of regulation should be implemented?

³¹ Information provided on www.francetelecom.com

- how can the long-term funding of the service and the plural requirements in matters of sustainable development be assured?
- how to ensure coherence between orientations set up by the European Union, for its own organisation and its position in, on the one hand, international commercial negotiations (WTO-GATS) and, on the other hand, its policy of cooperation in development?

A number of debates and opinions from all concerned actors (“stakeholders”) have come up in the past years, in France as well as at the European level and during international meetings. Many public debates have been organised. Some official reports have been published (Court de Comptes, 1997; Baert, 1999; Martinand, 2001; Tavernier, 2001).

2.5. CONCLUSION

France’s water sector is marked by the importance of delegated management of drinking water and urban wastewater systems. These systems have also been much influenced since the eighties by the EU requirements, and one can note that important progress has been made regarding drinking water quality and wastewater systems. However, the weak point of the French system is the control and sanctions regarding water pollution, which may make it difficult to comply to good ecological status of water with the transposition of the water framework directive...

After this overview of the French water sector, one can ask oneself how the French model could evolve in the future. One could imagine a first scenario with the return of public management of water services like the case of Grenoble. One can also mention some régies that exist in such town like Nancy, Reims, Strasbourg and Amiens... However, most régies exist for small communes, and municipalities can be unwilling to take this responsibility, knowing the technical complexity and financial burden. The second scenario could be that of an irreversible empowerment of water companies (without any regulatory authority): although competition is open to other operators, the power stays in the hands of the same monopoly. Finally, one could imagine a third scenario based on the predominance of delegation contracts but with a regulatory authority. For the moment, this authority does not seem to be included in the plans of the present government...

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www.environnement.gouv.fr Ministry of Environment

www.mairie-info.com town hall (mairie) site giving information on water

www.sp2000.asso.fr site of Service Public 2000

www.ladocumentationfrancaise.fr Information on water policy

www.ifen.fr French Institution on environmental data

www.ademe.fr Environmental Agency

www.rnde.tm.fr National Network on Water Data

www.cieau.com International Centre on Water

www.ate.tm.fr/fontaine Documentation Centre of the Basin Agencies

3. CHAPTER 3: COUNTRY REPORT SPAIN

SYLVIE LUPTON

3.1. INTRODUCTION

One of Spain's particularities compared to the rest of the European Union is its lack of available resources, because of important droughts and water deficits throughout the year in Eastern and Southern Spain. This Spanish problem of water availability has structured its policy for the last century, with the creation of dams and the establishment of massive water transfer programmes.

With its entry in the EU, Spain has also had to face demanding requirements on water quality and wastewater treatment which triggered more private sector involvement as we shall see in this country report. But has Spain escaped the hydraulic paradigm based on an offer based regime (with water transfers and massive waterworks) ? The following text will first give (in point 2) a general idea of Spain's water management system (institutional framework, resource status and use, general description of the history of water laws, main actors involved). This part will enable us to comprehend the changes Spain has undergone in its water policy, and assess the importance of private firms in the management of water supply and sanitation systems. The following part (point 3) describes the current legislation in all the phases of the water sector, from resource access to wastewater treatment. General objectives of the water laws will be given, and different instruments, target groups, actors of implementation and action logics will be highlighted. We shall also, when possible, draw attention to the effects of these laws, in order to observe if the objectives were really attained, and to stress the problems and limits of these policies. Finally, the last part of this report (point 4) underlines the future trends of the Spanish water policy (recent and emerging laws) and gives a general overview of Spain's position regarding the liberalisation of network services...

3.2. GENERAL FRAMEWORK FOR WATER MANAGEMENT

3.2.1. Institutional Framework

Spain has undergone a rapid change over the past thirty years, from a very centralized political organization to quite the opposite (Saurí and Del Moral, 2001). After the fall of Franco's dictatorship in 1975, Spain became a democratic State, politically structured in the form of a parliamentary Monarchy. With the Spanish Constitution of 1978, a decentralization process began in Spain: the 50 existing provinces were reconfigured into 17 Autonomous Communities (ACs), and two cities -Ceuta and Melilla- each governed by a Statute of Autonomy. The following map illustrates how the territory is shared among the autonomous communities and cities.

Figure 3-1: Map of Spain



Source: fotw.unislabs.com/flags/es

The range and scope of the respective Autonomous Communities is determined by the Constitution: for example, the State has exclusive powers as regards foreign policy or the



direction of economic policy, whereas education, health and environmental protection is shared between the State and ACs (Costejà and al., 2001). The Constitutional Court is designated as the competent body for settling any conflicts which may arise between the Central Administration and the Autonomous Communities.

As far as water resources are concerned, State administration and AC competences are determined as follows: when water flows through various Autonomous Communities, the State has exclusive competence for the legislation, order and concession of water resources, but when water flows entirely within the boundaries of an AC, the latter has the responsibility for all projects, construction and profitability of canals and irrigation works, as well as for spring and mineral water (Molina and al., 2002, p.3). They are also responsible for water quality and health standard controls³². Regarding the provision of drinking water and wastewater services, these are the responsibility of the 8000 municipal authorities. Apart from this, two other major institutions structure water management in Spain:

River Basin Authorities: hydraulic works, management and planning is the responsibility of river basin authorities. There are 9 inter-regional river basin authorities (called *Confederaciones Hidrográficas*) that are administratively affiliated to the Ministry of Environment. They are functionally completely autonomous, and are public law bodies with an independent juridical status distinct from the State. When these basins are intra-regional (which is the case of the basins of Catalonia, Basque Country, Galicia, Canary Islands and the Balearic Islands), these river basin authorities (five in all) depend on the respective ACs, and are called *Administraciones Hidrográficas* (Poste d'Expansion Economique de Madrid, 2001). These river basin authorities integrate *users communities* that are in charge of the management of a shared administrative concession or a shared water taking (when there is more than one user). The following map shows the location of these 14 water administrations, with the 9 inter-regional river basin authorities (in the lighter shade colour) and the 5 intra-regional river basin authorities (in the darker shade colour).

³² Let us add that according to the Spanish Constitution (art. 148.1.9. and 149.1.23) and Autonomous Community Statutes, the State enforces basic legislation on environmental protection and wastewater disposal, and the Autonomous Communities have competence in legislative development and execution, and have the power to enforce additional standards of protection (Molina and al., 2002).



Figure 3-2: Territories of basin administrations and other districts



Source: Marín, 2002

National Water Council

This is the highest consultative body on water policy, composed of 91 members representing State (ministries), regional and local administrations, river basin authorities, professional organizations, farmers, ecologist associations and universities. This institution can formulate opinions on legislative activities and hydraulic planning.

3.2.2. Resource Status and Resource Use

The main problem relative to the water resource in Spain is that there is “no natural adjustment of the demands of water, in quantity and quality, with the availability of the resource, both in space and time” (Ortega, 1997, p. 216). Although Spain enjoys an ample supply of water (available water is estimated at around 45 000 hm³/year) which is well

beyond the consumption levels, the hydroclimatic setting can explain the core of the Spanish water problem. First, there are long periods of water deficits and droughts throughout the year, occasionally brought to an end by shorter and destructive periods of floods. As a result, only 8% of the surface water is available at any time, compared to an average of 40% of Europe as a whole. Second, there are strong spatial mismatches in the distribution of water compared to the distribution of human settlement: the Northern and Central basins including the three main rivers (Duero, Tajo, and Ebro) concentrate around 76% of the water compared to 45% of the total population, whereas Eastern and Southern basins have 24% of water for 55% of the population (Saurí and del Moral, 2001). Therefore one can clearly note a mismatch between water availability and demand, with the eastern Mediterranean basins suffering the most acute problems. In order to respond to this inadequacy, hydraulic works have developed over the last 100 years: Spain has now more than a thousand dams, representing a total capacity of 39 000 hm³/year which represent the main guarantee for water supply. At present, water is used in the following way: surface water 76%, subterranean water 17%, spring water 3%, non-conventional resources (desalinated, reused, etc.) 4%. (Molina and al, 2001).

According to the INE, in 1999, the water abstracted by different sectors is as follows:

Table 3-1: Water abstraction (hm³/year)³³

	Water provision	Industry	Agriculture	Total
Spain	5 163	2 049	26 475	33 687
%	15.5%	6 %	78.5 %	100%

Source: INE, 1999.

All in all, agriculture through the use of irrigation abstracts the most water, representing around 80% of the resource.

Around 17 000 hm³ of water abstracted returns to the nature, that is around 53% of the water abstracted.

³³ These statistics have the inconveniency of not showing out the abstraction for cooling activities. Cooling activities are included both in water provision and industry, representing more than 4 000 hm³/ year in 1999 (around 12-13% percent).

As for consumption, total water consumed is of 28 084 hm³. 85% (23 853 hm³) is distributed through canalisation networks: water distributed through irrigation networks amounted to 19 775 hm³, and that of public supply was 4 078 hm³. Agriculture consumes 22 306 hm³ (79.4%), industry consumes 3 423 hm³ (12.2%) and households consume 2 354 hm³, that is 8.4% (INE, 1999).

Table 3-2: Drinking water statistics (for 2001)

Water available for urban water supply	4 804 hm ³
Water distributed	3 871 hm ³ (80.6%)
Water lost (leakages...)	933 hm ³ (19.4%)
Medium water consumption	165 litres/inhabitant/day
Medium price ³⁴	0.77 euros/m ³

Source: INE, 2003.

3.2.3. General description of the History of Water Laws

Spain's water policy has known many different changes throughout the last century, with an evolution from a centralized to a decentralized water policy, and its integration in the EU. We have highlighted five different phases characterising changes in the water policy approach.

3.2.3.1. Phase 1. 1866-1898: The distinction of property rights regarding water resources

The 1866/1879 Water Acts clarify property rights regarding water resources. The following box describes how property rights were established in the water acts of this period.

There is no policy or planning attributed to the State administration, and this lack of State intervention will be cruelly felt during the 1898 social and economic crisis, amplified by the

³⁴ Prices vary from one Autonomous Community to another. In 2001, La Rioja has a medium price of 0.42 euros/m³, (lowest price among ACs), and the Canary Islands have a medium price of 1.66 euros/m³(highest price among ACs).



loss of the last Spanish colonies (Cuba, Puerto Rico and the Philippines). The crisis has devastating effects on agriculture and increases poverty.

Box 3-1: Property rights on water in Spain in the 19th century

The Spanish system of property rights regarding water resources has been a dual system for a long time (and was only changed with the 1985 water law). According to this system implemented by the 1866 and 1879 Water Acts, and completed by the 1889 Civil Code:

Surface waters (rain water, rivers, springs, fountains) coming from or flowing along public land were considered as public property. Water that flowed along private property was considered as private property.

Ground waters: as long as they were undiscovered, water was considered as *res nullius*, it belonged to no one. Ground water belonged to the person who had discovered it (whatever the land, and even if the person was not the owner of the land), and could extract water with the authorisation of the landowner.

Source: Petit, 2002

3.2.3.2. Phase 2. 1898-1978: The emergence of a centralized water policy

Faced with the economic and social crisis of 1898, irrigation became a solid alternative to overcome this impasse. State intervention was needed as the structure of land ownership blocked innovation, because “neither the big landowners (who could rely on a large and cheap labour force), neither the small ones (who were rather poor) had the motivation or the resources to invest in more efficient technologies” (Saurí and del Moral, 2001, p. 355). Spanish identity had taken a blow with the loss of colonies, and irrigation was appropriated as an essential element in the *regenerationista* (regeneration) movement, lead notably by Joaquín Costa and Rafael Gasset. Water policy represented “all the economic policy that the nation must follow to redeem itself” (Costa, 1975, p. 259). This policy, known also as the “hydraulic paradigm”, was organized along three axes (Saurí and del Moral, 2001):

Water became an instrument of radical economic and spatial transformation: through irrigation, vast farming spaces of dry Central and Southern Spain would be put on equal footing with the traditional highly productive irrigation system of Eastern Spain.

State bore all the costs of the hydraulic infrastructure³⁵ and insured other aspects of rural development such as the provision of agricultural inputs and technological know-how.

³⁵ Water user fees were created in 1902 for purposes of infrastructure cost recovery.

No consideration was given regarding ecological, cultural and aesthetic dimensions of “national interest”.

Hence, hydraulic works, reservoirs, irrigation and water transfers developed drastically. In 1926, the *Confederaciones Hidrográficas* were created, giving a river basin focus to the hydraulic policy. This was by no means a decentralization of the water policy, as these river basin authorities depended directly on the State’s authority and financing. This policy became firmly established during Franco’s dictatorship. It was composed of what Pérez-Díaz and Mezo (1998) call a “community of hydraulic policy”, formed of a restricted number of different actors very closely and stably related to each other, very far from the public’s interests. This community was composed of the government, civil engineers at the service of administration (*Cuerpo de Ingenieros de Caminos*), farmers using irrigation, and civil engineering firms (Ramos Gorostiza, 2001). In the government, the Directorate General of Hydraulic Works (*Dirección General de Obras Hidráulicas*) was working very closely with the Ministry of Agriculture, and the most important decisions related to the water policy were taken by these institutions, on which many smaller bodies depended (*Confederaciones Hidrográficas, Servicio Geológico de Obras Públicas*- Geological Service of Hydraulc Works-, *Centro de Estudio Hidrográficas* –Centre on Hydraulic Studies-, etc...)³⁶.

3.2.3.3. Phase 3. 1978-1985: The decentralization process

The democratisation of the Spanish political system had significant impacts on the water policy. The Spanish constitution of 27 December 1978 created a decentralized model in which powers were redistributed between the State, the 17 Autonomous Communities and municipalities (for repartition of competencies, see point 2.1). The Constitution also establishes the need to promote the rational use of water and defend and restore environment (article 45). The fragmentation of the water regime, the increase of social participation and increase of water demands and its over-use brings in the need for the establishment of a revision of the water legislation, which will give rise to the 29/1985 Water Act.

³⁶ Regarding water treatment, wastewater disposals start to be regulated with the creation of the Comisarías de Aguas in 1959.



3.2.3.4. Phase 4. 1985-1999: A more complex and integrated water policy

The 1985 Water Act marks a new period for the Spanish water regime, based on the following elements. All continental water resources are qualified as belonging to the public domain. It recognizes the choice open to holders of private water rights to opt to continue under a private ownership system (under very restrictive conditions), or to change to a public ownership (with advantageous conditions), which meant that their status changed from being owners to concessionaires of public water resources (Embid, 2002, p. 263). The law also establishes a procedure of national planning (the famous *Plan Hidrológico Nacional*) and water management through hydraulical basins: any action concerning the hydraulic public domain is subject to hydrological planning (article 3.1 of the 1985 Water Act)³⁷. It encourages users' participation in water planning, and the National Water Council is created (see point 2.1). The *Confederaciones Hidrográficas* are changed into basin institutions alike those in France (*Agences de l'Eau*). This Water Act moves towards a more integrated regime including technical, economic, and administrative aspects; water quantity but also quality; water treatment; environmental protection; and finally water control and monitoring. Two financing instruments are introduced: the regulation tax and the water use rate (collected by the *Confederaciones Hidrográficas*), that aim at compensating the State for investments, exploitation and maintenance costs relative to hydraulic works. Moreover, this law introduces discharge fees (*Cáñones de Vertido*) to be set, collected, managed and applied by the *Confederaciones Hidrográficas*, in order to improve the environment of the river basins.

Another factor that adds to the Spanish water system's complexity is its entrance into the EU on 1 January 1986, taking on the Community package of measures concerning water resources (drinking water, bathing water, wastewater³⁸). For example, a decree of 14 September 1990 is established to conform to the European directive on drinking water quality (778/80).

³⁷ According to the 1985 Water Act, the country must develop water plans at two scales: at a basin level, and at national level. The responsibility for approving basin plans lies in the Ministry of Environment's General Directorate for Hydraulic Works and Water Quality with the collaboration of other state ministries, the regions concerned and water users. The National Hydrological Plan, on the contrary, has to be approved by the Spanish Parliament who discusses and may modify the proposal presented by the General Directorate for Hydraulic Works and submitted to Parliament by the Council of Ministers.

³⁸ The implementation at Spanish level of these different directives will be seen in the last part of this document, so we will not go further in detail here.



However, if this new water policy integrates various dimensions that were forgotten in the first phases of the water policy, one must note that Spain has not yet escaped the “hydraulic paradigm”, mainly focused on a water supply logic. The National Hydrological Plan of 1993 illustrates this. If the draft of this plan included measures notably for flood control and water quality, its main concern was the development and transfer of water supplies. Just like during phase 2, Spain’s water problem was presented as that of the unequal distribution of water resources and the recurrence of droughts (Saurí and del Moral, 2001). The draft of this plan (*Anteproyecto del Plan Hidrológico Nacional*) included very high water demand estimates (up to 9 billion cubic meters in 20 years) to be satisfied with water development schemes (more than 100 new reservoirs), and with the multiplication of water transfers from 3800 hm³/year to more than 10 000 cubic hectometres/year. These transfers were planned from the North/Douro basins and the low Ebro towards southern basins (Guadiana, Guadalquivir, Sur, Segura, and Pirineo Oriental) with water deficits (Maia, 1999). It also included an increase in irrigated land of around 600 000 hectares in 20 years. The State would finance all the costs with funds provided by the EU (Cohesion Funds or Regional Funds). This project faced important controversy, and donor basins were quite against the project. This Water Plan ignored the role of demand management, and had not included other alternatives than the water transfers to respond to droughts and water deficits (ex: desalination of sea water, water re-use). The benefits of the plan were presented without evaluating the economic and energetic costs linked to this enterprise, and without explaining who would have to pay for this plan (Arrojo, 1997). Moreover, environmental dimensions were not seriously envisaged. It was perceived by some critics not only as a hydraulic plan but a new model for the country, characterized by a loss of hydraulic patrimony in favour of the empowerment of the Mediterranean coast, under the service of uncontrolled interests (Martínes Gil, 1997). This project was sent to the National Water Council that concluded that the inter-basin transfers must be implemented as a last resort. Despite the modifications introduced in the original proposal (alternatives to water supply like desalination, reduction of the number of reservoirs...) the National Hydrological Plan was never presented to the Spanish Parliament.

During this phase, the conservative government came to power in 1996. Aware of the need for more water development in some areas, it first directed its efforts at modifying the 1985 Water Act, particularly concerning the implementation of more flexible mechanisms of water

right transfers among users and the privatisation of some components of the hydrological cycle such as re-used water (Saurí and del Moral, 2001). The Ministry of Environment is created in 1996, holding powers on environmental protection and water policy. This Ministry carried out the process of consultations during the making of the new Water Act. A Water White Book was elaborated in 1998, analysing the Spanish water problem, and establishing the principles of a new water policy.

3.2.3.5. 1999-2003... *The end of the hydraulic paradigm ?*

As a consequence of the White Book, the Spanish Parliament modified the 1985 Water Act in 1999 (this shall be further described in the next part of this text, which handles with the present phase). The main change in this Water Act is the creation of water markets. The state determines the areas and period under which water rights can be traded, and must be informed about contracts, which must comply to the following rules: water cannot be sold for uses that are secondary to that for which the permit was granted; public institutions have preference in purchasing, and public authorities can prohibit contracts contrary to the general interest. In periods of droughts or severe water deficits, the water authorities will facilitate water banking. (Saurí and del Moral, 2001). This legislation also promotes water savings policies with a compulsory measurement of consumption and waste discharge in each River Basin Agency, and the penalisation of excessive consumption. Moreover, greater environmental consideration is shown with dumping authorisation conditions.



Table 3-3: Phases of the Spanish water policy:

PHASES	POLICY DESIGN	ACTORS OF IMPLEMENTATION
1. 1866-1898 The distinction of property rights regarding water resources	<u>Objectives</u> : clarify water rights regarding water resources <u>Causal Hypothesis</u> : clarifying water rights enables settling conflicts over use <u>Instruments</u> : Legal framework (Water Act 1866/1879) <u>Target groups</u> : all water users	State administration
2. 1898-1978 The emergence of a centralized water policy	<u>Objectives</u> : to develop irrigation all over Spain <u>Causal Hypothesis</u> : if we develop irrigation in dry lands of Central and Southern Spain this will enhance economic and social development <u>Instruments</u> : State investments in hydraulic infrastructure, water user fees created in 1902 for purposes of infrastructure cost recovery <u>Target groups</u> : farmers using irrigation	Directorate General of Hydraulic Works, Ministry of Agriculture, civil engineers at the service of administration, <i>Confederaciones Hidrográficas</i>
3. 1978-1985 The decentralization process	<u>Objective</u> : democratisation of Spanish regime and decentralization <u>Causal Hypothesis</u> : Decentralisation provokes a redistribution of power between different actors <u>Instruments</u> : Constitution of 27 December 1978 <u>Target groups</u> : autonomous communities and municipalities	State administration
4. 1985-1999 A more complex and integrated water policy	<u>Objective</u> : redefinition of property rights, water planning, water quality, environmental protection (respecting EU requirements). <u>Causal Hypothesis</u> : if we protect water resources, then we will be able to produce better water quality; concerning water planning, if we irrigate dry areas, we will develop agriculture in these areas and encourage Spanish economic competition <u>Instruments</u> : 1985 Water Act, discharge fees for industries, regulation tax and water use rate, National Hydrological Plan of 1993 (abolished) <u>Target groups</u> : farmers, households, landowners, industries	Ministry of Environment, Directorate General of Hydraulic Works, <i>Confederaciones Hidrográficas</i>
5. 1999-now The end of the hydraulic paradigm ?	<u>Objective</u> : development of water markets, environmental protection and water quality (respecting EU requirements), water saving policy <u>Causal Hypothesis</u> : at micro-level: the establishment of water markets gives more flexibility to the trade of water rights; water saving policies enable a better use of water resources, and the better environmental quality of water, the easier the treatment of drinking water; At macro-level: the National Hydrological Plan of 2001, encourages water transfers between river basins in order to supply areas lacking water (this is in opposition with the 1999 Water Act's objective to save water) <u>Instruments</u> : the 1999 Water Act, water markets, hydraulic infrastructure investments, compulsory measurement of water consumption and waste discharge, penalisation of excessive consumption (through tariffs), the 2001 National Hydrological Plan <u>Target groups</u> : farmers, landowners, households, industries	State administration, Ministry of Environment, Directorate General of Hydraulic Works, <i>Confederaciones Hidrográficas</i>

The Ministry of Environment then set up a National Hydrological Plan, that was adopted by Parliament in 2001, which proposes again water transfers between river basins, which we shall develop further. This Plan is not always in accordance with the 1999 Water Act, as “it has not waited for the results of the contracts for the cession and water exchange banks in terms of efficiency and increasing available resources, nor for the possibilities of water desalination, re-use of sewerage water” (Costejà and al, 2001, p. 19): it has not at all focused on the search of a more water saving policy. This seems to mean that the hydraulic paradigm is not yet over...

This phase is characterized by a mix of policy strategies with stringent regulation (mostly influenced by EU directives), water markets and investments on hydraulic works.

3.2.4. Main public and private actors involved

One can observe a clear trend towards more private sector involvement in the field of water supply management due to the fact that municipalities are confronted to high investments to conform to EU Directives and are faced with exhausted public funds, and growing technical complexity of infrastructures. This has lead to an increase in the price of drinking water: in 1996, private water companies billed services for a value of 450 billion pesetas, and this figure is expected to grow, making urban water supply one of the most profitable areas from the dismantling of services previously provided by public institutions (Saurí and del Moral, 2001).

Concerning administration, State (Ministry of Environment) establishes legislation relative to water. In the Ministry of Environment, the Secretary of State (*Secretaría de Estado de Aguas y Costas*) establishes regulation relative to waters and coasts. The Directorate General of Hydraulic Works and Quality of Waters (*Dirección General de Obras Hidráulicas y Calidad de las aguas*) is responsible for the elaboration of the National Hydrological Plan and control of activities provoking contamination and degradation of the hydraulic public domain. It is also responsible for the authorisation of wastewater discharges. The 17 Autonomous Communities are in charge of the execution of this legislation and can elaborate additional rules of environmental protection (for repartition of competencies between State and ACS see point 1.1). *Confederaciones Hidrográficas* and *Administraciones Hidrográficas* are

responsible for the elaboration and follow-up of the Hydrological Plan of basins (*Plan Hidrológico de Cuenca*) and controls water quality and discharges (*Comisarías de Agua*, created in 1959).

As far as the production/distribution of drinking water is concerned, municipalities are legally responsible for this service, but cities or big towns higher than 20 000 inhabitants often delegate the service to private companies. Private participation now reaches around 50% of the supplied population. The main group is Aguas de Barcelona (Agbar) which supplies around 25% of the population³⁹ (836 municipalities are served, representing 11 440 000 inhabitants), and then comes the Spanish group FCC (with Vivendi's participation) which serves 7 200 000 people (18% of the population), and Bouygues Saur –with Gestagua, Aguas de Valencia and Emalsa- serves 3 000 000 inhabitants, representing 7% of the population. In Spain, the traditional model of private sector involvement is the concession one: the private partner finances and manages the infrastructures (treatment and distribution), that stay under public ownership (Vila Bassas, 1997). However, the shared (public-private) company model has also developed, now representing 15% of delegated private management. In this model, public participation is around 51% and private is 49%. The municipality has the majority of shares, but decisions have to be taken by consensus (Porta, 2001). The remaining proportion of the drinking water supply sector is managed by direct public management (municipal or regional corporations and associations) representing 45.5% of the supplied population. This concerns small towns, less complex and therefore more easily manageable by municipalities (Molina and al., 2002). A state legislation (Law 48/1998) specifies general parameters within which contracts should be granted, but it is up to municipalities to establish more accurate clauses regarding contracts, which are different in each local case.

Concerning wastewater networks and treatment, sewage networks are mostly managed directly by municipalities (Molina and al., 2002), that also often carry out the construction of sewage disposal networks. Regarding wastewater treatment, private participation has significantly increased with the 1991 EU directive on urban wastewater treatment, due to the important financial investments needed and technological know-how. Municipalities in big towns or cities mostly delegate wastewater treatment to private companies (the concession

³⁹ Total population amounts to around 39 700 000 inhabitants.

model predominates). We find the same companies as for drinking water supply services: Agbar serves 396 municipalities, representing 502 wastewater treatment plants in operation, and 15 100 000 inhabitants (population load equivalent). FCC provides waste water treatment service to 9 500 000 inhabitants, and Bouygues provides the service to 750 000 inhabitants. The rest is managed by municipalities (local public companies). The rate of connection to wastewater treatment plants is of 58% (population equivalent) in 2000 (Alfonso, 2002).

Figure 3-3: Organization of Water Actors in Spain

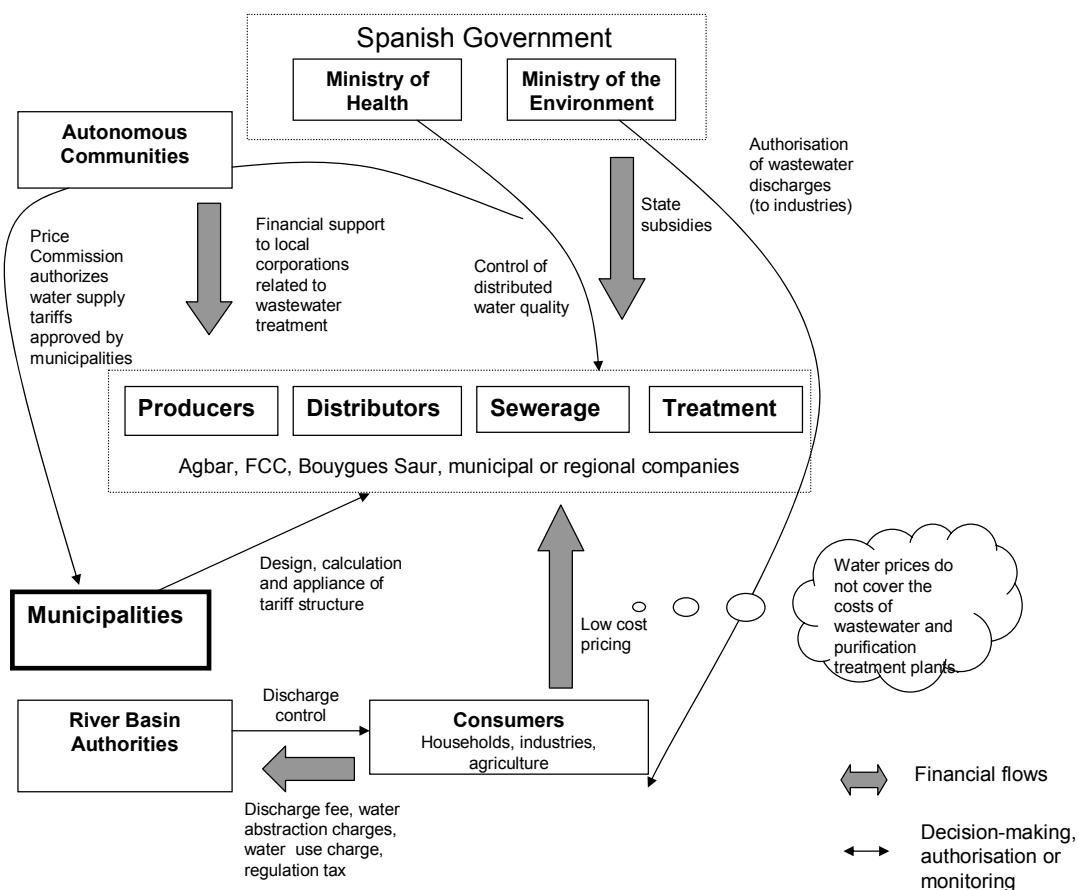
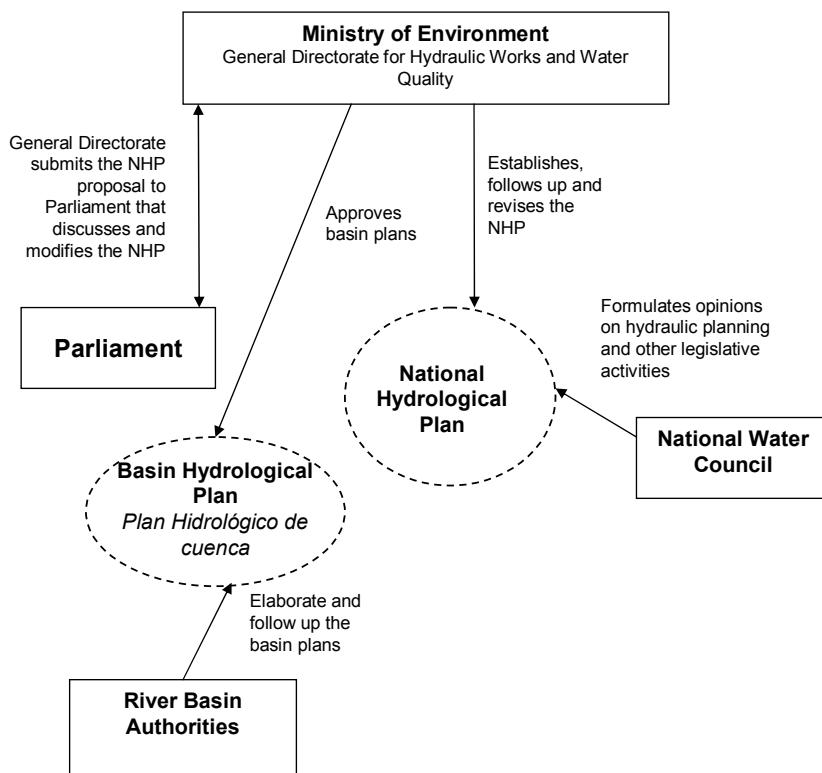


Figure 3-3 summarizes the organization of water actors in Spain, stressing mostly on the financial flows between actors. To sum up this figure, one can mention the following elements: companies (public or private) propose tariffs to municipalities who are the ones who have the final say on their design and content. A Price Commission (at Autonomous Community level) is legally bound to authorize water supply tariffs approved by municipalities. The role of this Commission is mostly to prevent a rise in prices higher than

the rate of inflation. Consumers pay the water price to distributors. However, Spain has the particularity of having high infrastructure investments (especially for wastewater treatment facilities and purification treatment plants) making water costs one of the most expensive in the EU, but it paradoxically has the lowest water prices (Maia, 1999). For what concerns agricultural water use, prices have not changed in decades, and this does not enable full cost recovery. Therefore, costs that should be financed through water bills are being financed through state and regional subsidies.

As for the National Hydrological Plan and basin plans, the following figure must be added to get a more comprehensive picture of Spain's organization of water actors:

Figure 3-4: The National Hydrological Plan and basin plans



3.3. SYNCHRONIC ANALYSIS OF THE CURRENT LEGISLATION

3.3.1. Resource Access

3.3.1.1. Property rights on the water resource

Regarding the water service sector, what can be privatised is the water management and not the water resource itself. Water infrastructure (treatment plants and network) stays *in fine* under the ownership of municipalities.

Concerning raw water, according to the 1985 Water Act, all continental water resources (both subterranean and surface waters) belong to the public domain⁴⁰. However, traditional water owners under the 1866/1879 Water Acts (see point 2.3. phase I, p. 3) can keep their private property, and have two alternatives (Costejà and al., 2001)⁴¹:

They can change their property rights into temporary private use rights. This regime will be respected for a period of 50 years at the end of which owners will be able to choose the corresponding administrative concession to their use.

They can maintain their use rights in the way established by the previous Water Acts. But if they modify the exploitation conditions, they loose their property right and have to apply for an administrative concession (with a maximum of 75 years for the length of the administrative concession).

Added to this is the system of water markets and banks, introduced by the 1999 Water Act. It admits the existence of contracts for the cession of use rights (*contratos de cesión de derechos de agua*), giving more flexibility to the concession holders to reach a high level of efficiency in the use of this natural resource: surplus water can be sold to other concession holders (Costejà and al., 2001)⁴². The contracts have to be set up between two concession

⁴⁰ One exception to this rule is the Canary Islands where groundwater is strictly private.

⁴¹ Apart from the continuation of ownership of some subterranean, surface and spring waters, the Water Act 46/1999 mentions private ownership of watercourses in which rain occasionally flows and of ponds on private property, and extends this to lakes and tarns (see also Embid, 2002)

⁴² One must add that this means the temporal ceding of the use of water, but not the outright sale of the right to water, which is allocated by the state.

holders having the same level of priority (ex: population supply, or land irrigation ...), and this must then be authorized by the River Basin Authorities. Public bodies have priority of purchase, and the state can cancel contracts if it finds them to be contrary to the public interest. Moreover, in extreme situations (ex: drought situations), water banks may be set up: temporary transfers of water rights can be allowed by the state that acts as an intermediary between buyers and sellers (Bakker, 2002). This change in water policy has caused much controversy notably regarding the volume of water that could be transferred and the dominant role of hydroelectric companies who hold rights for important quantities of water. In order to appease opposition, hydroelectric companies were banned from entering transactions (Giansante, Babiano and Del Moral, 1999). With this new Water Act, water is not only a public good but a tradable one (Bakker, 2002).

3.3.1.2. *Public Policies on the Resource*

Legislation in force

- 1985 Water Act
- 1999 Water Act
- Royal decree 261/1996 on nitrates
- National Hydraulic Plan 2001
- Regulation of the Hydraulic Public Domain (Real Decreto 927/1988)
- Different AC laws regarding Hydraulic Plans at AC level

Objective: There are two main concerns of public policies regarding resource access: 1) To preserve natural water (potential drinking water) against pollution and improve its quality; 2) As water resource in Spain faces important problems of scarcity in some areas, water transfers are encouraged through water markets and national and basin hydrological plans.

Instruments: Regarding prescriptive instruments, there are police zones (*zonas de policía*) on lands close to river beds and water sources. Activities in these police zones need the authorization of River Basin Authorities when lands are changed to a certain extent (construction...) and could represent an obstacle to the water flow or cause a deterioration of the hydraulic public domain. Moreover, protection perimeters (around catchments) are delimited by River Basin Authorities, in order to protect ground waters that are used for drinking water. Authorizations and concessions are the administrative acts that enable the use



of the hydraulic public domain. Concessions are accepted, taking into account the rational use of the subterranean and surface waters⁴³ (art. 57.2, 1985 *Ley de Aguas*). As for nitrate pollution, Autonomous Communities have adopted of code of good practice and nitrate vulnerable zones. Concerning negative incentives, if water resources are considered to be overexploited and represent a deterioration of the hydraulic public domain, the responsible actors will be subject to economic sanctions –fines– (art. 109, *Ley de Aguas*) and the obligation to rehabilitate waters to their initial state. Last but not least, regarding economic instruments (taxes, charges), one must mention two charges⁴⁴: water abstraction charges are levied after licenses regarding water abstraction are granted. The rate depends on the different uses: irrigators pay 0.006 euros/m³; municipal suppliers pay 0.003 euros/m³; and hydroelectricity companies pay 0.0006 euros/m³. This charge is collected by River Basin Authorities, and used for the financing of river basin management. Charges on the use of water resources (*canón de utilización de bienes del Dominio Público*) are established and collected by the River Basin Authorities, and charge the occupation or use of public resources⁴⁵. Its revenue is destined to the protection and amelioration of the public domain.

Regarding water transfers, market systems have been established (water markets and banks)⁴⁶ in order to facilitate the transfer of water resources especially regarding dry regions. Apart from these systems, there are also autonomous hydrological plans that are established by river basin authorities in order to attain a better satisfaction of water demands and harmonize regional development, protect water quality, economize its use and respect the environment. Added to this is the famous National Hydrological Plan established by the Ministry of Environment and adopted in June 2001. This has been highly contested by some environmental groups (WWF...), the affected irrigation communities and a vast majority of the scientific community. One of the points of disagreement is the ecological dimension: Ebro water transfers will perturb and destroy the ecosystem around the Ebro delta with the

⁴³ For example, water allotment rights are assigned through concessions to individual irrigators.

⁴⁴ There are also two other charges levied in favour of the Basin Authorities that we must also mention. These are financing instruments (the regulation tax- *canón de regulación* - and the water use rate) aiming at compensating the State for the investment on hydraulic works, and at paying for the exploitation and maintenance costs of such works. They are paid by the beneficiaries of regulatory means regarding surface and subterranean water (beneficiaries of water transfer plans and other hydraulic works), which have been financed totally or partially by the State.

⁴⁵ This concerns all activities requiring an authorization or concession like energy generation, sports use...

⁴⁶ This was developed in point 3.1.1. on property rights on the water resource.



reduction of sediment inputs and of fish, a deterioration of water quality, and habitat destruction (Day and Maltby, 2002; Pastor González, 2001; Naredo, 2002). The next box summarizes the content of this plan.

Box 3-2: The 2001 National Hydrological Plan (NHP)

The NHP is a legislative text which includes a series of investments (proposing 863 water infrastructure and other works) for the whole Spanish territory. The central issue is the regulation of water resources by transfers from catchments with water excess towards catchments with water deficits. Apart from the already existing water transfers (e.g. Tajo - Segura), the plan establishes the creation of a new water transfer of 1050 cubic hectometres/year from the Ebro river to Catalonia (190 hm³), Comunidad Valenciana (315 hm³), Murcia (450 hm³) and Almería (95 hm³). Except for the 190 hm³ to be used to supply fresh water to the urban area of Barcelona, the remaining transferred volumes are reserved for the agricultural areas that have irrigation rights, or for the improvement of the ecological quality of water ecosystems subject to severe degradation in the Southwest of Spain.

The plan includes an expenditure of 4 207 million Euros for the Ebro water transfer (to be executed in 8-10 years) and other investments amounting to 8 869 million Euros for a number of hydraulic works (dam construction, improvement of irrigation infrastructures). Other sums are reserved for desalination, water treatment and supply (5 420 million euros), water quality control (1 260 million euros) and finally flood prevention and reforestation (3 294 million euros). The government foresees that a third of the cost will be paid by the EU.

According to the Ministry of Environment, the cost of water transfers will be of 0.3 euros per cubic metre. The water price for the final user will cover this cost. The territories of the Ebro watershed that provide the water will be paid 0.03 euros per transferred cubic metre to fund the hydro-environmental programmes in the Ebro area.

Source: RiverNet, 2003

Target groups: water producers, residents, farmers using irrigation and other activities requiring permits and concessions (water sports...), farmers (husbandry-regarding nitrate measures).

Actors of implementation: Government, Ministry of Environment, River Basin Authorities, municipalities and irrigation communities

Action logic: 1) If we regulate water extraction and limit water pollution, then we shall guarantee a better drinking water quality; 2) If we allow water transfers , we favour irrigation and water supply in dry areas (these two action logics can be contrary).

Effects: Regarding the use of water resources, irrigators are only charged an amount that corresponds to costs incurred in the construction and maintenance of conveyance and storage facilities (representing around only 15% of the costs). Therefore, there is a high subsidization



by the government, and low cost recovery. Hence, water demand management is badly needed in Spain (Varela-Ortega and al., 1998).

The General Manager of Hydraulic Works and Quality of the Ministry of Environment notes the problem of the implementation of protection parameters around catchments. He notes that in big urban areas such as Madrid, Barcelona, Valencia, Málaga and Granada, there are important infrastructures related to the extraction of ground water used in time of drought, but only one protection parameter was established (*manantial de Arteta*, Pamplona) in 13 years of existence of the law (Royal Decree 927/1988). This could cause serious health problems in the case of a punctual contamination around catchments, that municipalities and River Basin Authorities are not sufficiently informed and aware of (Sánchez González, 2001).

Concerning the protection of water resources, a third of the rivers in Spain do not have a good water quality, which means that water is not adequate for water supply use for fisheries and leisure. This situation is worse than most other EU countries and shows that measures relative to water protection are insufficient (not enough incentives and credible threats) (Castillo López, 1999). Economic instruments lack sufficient administrative and technical and human means: for example, only 50% of irrigators are subject to taxation. Regarding nitrate pollution, some areas of intensive husbandry (especially pig husbandry) suffer important and alarming concentrations of nitrates especially in Catalonia. The European Commission sent in 2001 a second warning letter to Spain regarding the situation of nitrate pollution in the groundwater of Baix Ter in Catalonia: around 25% samples of water was above the authorized average. The Commission explained this pollution as the fruit of a lack of control of pig husbandry in the area.

In the following municipalities, the concentration of nitrates is several times higher than the authorized nitrate concentration (50mg/l) (see Table 3-4).

Table 3-4: High nitrate concentrations of water resources in some municipalities (in mg/l)

Vilanova de Meià	429
Subirats	349
Tremp	307
Vilanova i la Geltrú	309
Sant Guim de Freixenet	210
Cambrils	169
Vilamacolum	151

Sources: La Vanguardia, 15/04/2002 and 13/02/2001; El País, 15/02/2001

3.3.2. Water Production

Legislation in force

- 1985 Water Act (modified by the 1999 Water Act)
- Law STC 208/91 on the quality of drinking water
- Royal Decree 140/2003 on health criteria for drinking water
- Royal Decree 927/1988 regarding the Public Hydraulic Domain
- 1988 Order relative to basic characteristics of surface water intended for the production of drinking water
- Basic Law on local regulation
- Laws at Autonomous Community level

Objectives: Water production comes mostly from surface water. The aim is to limit pollution upstream from agriculture (nitrates from excess manure and pig slurry) and industry⁴⁷ and have sufficient infrastructure and safe techniques to produce good quality drinking water.

Instruments: -*Prescriptions*- Standards are imposed on substances used for the treatment of water: each substance or preparation added to the water destined to human consumption must respect the UNE-EN standards. Treatment infrastructure must also be subject to prior homologation processes. Protection parameters must be established around water catchments. Municipalities that manage water production are responsible for the control of water quality.

⁴⁷ For industrial discharges see point 3.5. on wastewater treatment.

Economic incentives: infrastructure costs are provided notably through government subsidies and EU funds.

Self regulation: When water production is managed by private companies, the latter do the auto-control of the water quality produced.

Target groups: water producers, farmers (nitrates), households

Actors of implementation: government, municipalities, autonomous communities⁴⁸

Action logic: If we protect water and set up proper infrastructure, then we can guarantee the production of safe drinking water at an affordable price

Effects: drinking water production is usually satisfactory regarding the population served: in 1998, 251 litres/inhabitant/day of drinking water were available, for a medium consumption of 160 l/inhab./day in the whole of Spain. There are also growing efficiencies in catchments: in 1998, in order to provide 1 litre of water, it was necessary to catch 1.18 litres of raw water, whereas in 1999, only a catchment of 1.16 litres was necessary.

3.3.3. Water distribution

Legislation in force

Basic Law 7/1985 on local regulation

1988 Order relative to basic characteristics of surface water intended for the production of drinking water

1985 Water Act (modified by 1999 Water Act)

Law STC 208/91 on the quality of drinking water

Royal Decree 140/2003 on health criteria for drinking water (modifying the royal decree 1138/1990 on drinking water)

General Law 14/1986 on Health

AC laws

⁴⁸ As mentioned in the box on legislation in force, there are mainly laws that have been established at Autonomous Community level. One example is the law 6/1999 of 12th July on the organization, management and taxing of water. The Autonomous Government of Catalonia has assumed all competence in the area of water, hydraulic works and protection of the environment.

Objectives: The main aim is to provide good quality drinking water, respecting minimum health standards. The rational use of water by households is also sought, and water supply must respect public service principles of continuity and affordability.

Instruments: -*Prescriptions*- Microbiological, chemical and indicative parameters have been recently fixed (Royal decree 140/2003) in application of the EU directive 98/83 on drinking water. Regarding the control at the tap, municipalities are responsible for guaranteeing this control. – *Self regulation*- Quality monitoring is not only imposed at the end of the drinking water treatment plant process, but also in the drinking water reservoirs prior distribution, in the distribution network and at the tap. This enables to find the cause of a possible contamination (due to insufficient treatment, or to pipes, or to reservoirs) and to delimit the responsibility of each actor (municipality, water company).

Economic instruments: Regarding water charges, each municipality can follow a different pattern. Generally there is either a fixed tariff or a binomial tariff (most current). The latter is based on a fixed amount independent of consumption and a proportional amount based on consumption, which enables a better use of drinking water. Water charges levied are used to finance management, service expenses water collection and treatment. In Catalonia (Barcelona) for example, the binomial tariff is as follows: the fixed amount for poor households (based on the size of housing) is six times smaller than for rich households. This favours access to all, whatever the social differences. Regarding the proportional amount based on consumption, the water supply unit price for a consumption of over 192m³/year is three times higher than a consumption of less than 72m³/year (Smets, 2001).

Economic incentives: An important part of investments in water supply infrastructure is covered by subsidies representing around 50% according to Maestu (1996). Important subsidies have also been granted by the EU Cohesion Funds: in 1999, drinking water supply was financed by a total of 259.4 million euros.

Information: In the case of a health alert confirmed by health authorities, municipalities or operators in charge of drinking water supply must inform the population of health hazards in a 24 hour delay. Information on water quality must be given to consumers by the competent administration implied (municipalities, ...) and the managers of the water distribution. The Ministry of Health must establish a national information system concerning the control and



supply of drinking water quality (SINAC: *Sistema de Información Nacional de Agua de Consumo*). For this system, municipalities, water operators, health authorities at AC level will have to participate in the provision of information. The information collected will then be centralized by the Ministry of Health (under the form of a document on “the quality of water supplied”) and given to the European Commission.

Target groups: water distributors, subscribers to water services, consumers, municipalities (price determination).

Actors of implementation: government, Ministry of Environment, Ministry of health, water distributors, municipalities

Action logic: If we set stringent standards and rationalize water use, then we can guarantee good water quality access to all.

Effects: Although we cannot evaluate the effects of the new 2003 Royal Decree on drinking water quality (applying the directive 98/83/EEC which will replace the former 80/778/EEC directive from the 25th December 2003)⁴⁹, one can already assess the application of the former Royal Decree 1138/1990 (applying directive 80/778/EEC). Up to now, water quality supplied is generally of good quality and respects the quality standards. In 2001, 98.1% of drinking water supplied was conform to the legislation. According to the AEAS⁵⁰, this percentage has not changed in 2003. However, according to M. Palau from the Ministry of Health, 30% of supply zones have microbiological difficulties due to a lack of disinfection, and 15% of supply zones have problems with pesticides.⁵¹

Distribution networks still need to be drastically improved and maintained. According to the Spanish Statistics Institute (INE), in 2001, 933 hm³ of water distributed was lost due to leakages, pipe bursts..., representing 19.4% of the total water supply available.

⁴⁹ This decree should normally have been established before the 25th of December 2000 in order to transpose the new EU directive.

⁵⁰ AEAS: *Asociación Española de Abastecimiento de Agua y Saneamiento*.

⁵¹ *Salud y Seguridad*, 5th June 2003, www.consumer.es



3.3.4. Sewerage

Legislation in force

1985 Water Act and Royal Decree 1/2001 modifying this water act

1995 National Plan for Wastewater treatment 1995-2005 (approved by Resolution of 28th of April 1995)

Decree-Act 11/1995 establishing standards for urban waste water treatment

Order of 25th of May 1992, modifying the order of 12/11/1987 relative to dangerous substances in wastewater discharges

Objective: Preserve the quality of surface and groundwater, and organize and plan wastewater collection and treatment in each Autonomous Community. Develop sewage networks.

Instruments: The national plan for wastewater treatment (Plan Nacional de Saneamiento y Depuracion de Aguas Residuales) was conceived by the Ministry of the Environment as a document to provide planning guidelines for all wastewater management and treatment infrastructure efforts that should be carried out at regional level by different autonomous communities around the nation, in order to comply with the requirements of the 91/271 EU directive. In order to execute this plan, cooperation agreements were signed between the central government and different Autonomous Communities.

-*Prescriptions*⁵²- Sewage collection systems must be provided by the 31st December 2005 for urban areas between 2000 and 15 000 p.e. For urban areas above 15 000 p.e., collection systems must be provided by the 31st of December 2000. Concerning sensitive zones, these must be equipped with wastewater collection systems by the 31st of December 1998 for urban areas above 10 000 p.e. Quality requirement for sewage collection systems must also be respected: systems must use adequate techniques so as to be perfectly impermeable, and impede the contamination due to the overflow of rain water.

Restrictions are imposed on discharges: prior authorization of River Basin Authorities is needed for discharges. Limits are imposed regarding the concentration of certain dangerous substances (cadmium, mercury...) for different industrial sectors.

⁵² All the following instruments were part of the national plan.

Incentives: Subsidies are given by the central government and EU (through EU Cohesion Funds). Regarding industrial discharges, special attention is given to reduce contamination at the source: production processes generating more pollution to water resources are encouraged through subsidized credits given by the Ministry of the Environment⁵³.

Target groups: municipalities, households, industries

Actors of implementation: Ministry of Environment, Autonomous Communities, municipalities (competent in sewage networks).

Action logic: The planning of the development of sewage networks and wastewater treatment plants will enable to guarantee a better management of wastewater, and therefore enable a better quality of water resources and drinking water.

Effects: Most Autonomous Communities have developed regional plans for wastewater collection and treatment, and most were actually designed before the National Plan for Wastewater Treatment⁵⁴. Most ACs have also set up the water sanitation charge, which is based on the volume of water consumed. Before the implementation of the nation plan, sewage lines had insufficient capacity and were in a very poor condition. This situation has changed with the heavy investments engaged in wastewater collection and treatment (estimated in 1995 at 4 773 million euros for the financing of collection systems⁵⁵). As a result, the proportion of population connected to sewers has increased and was estimated in 1995 at 48.3%⁵⁶. In 2000, 8 381 184 m³/day of residual waters were collected.

⁵³ One must also add that some municipalities include a sewerage service charge in the tariff system for water supply to recover operating and maintenance costs (full cost recovery principle applies for sewerage services).

⁵⁴ The national plan imposed obligations to be implemented at regional level, some of which had already been set up before the National Plan.

⁵⁵ We were not able to find the actual investments in 2003 and exact percentage of population connected as usually numbers are given for general figures for the whole wastewater collection and treatment system, which we shall develop in the following section on wastewater treatment.

⁵⁶ It is very difficult to get data on the present percentage of population connected to a sewerage network. The last percentage I found was of 48.3% for 1995 (Wieland, 2003; OECD, 2003), but this data only includes urban wastewater collecting systems with treatment, and not sewerage networks without wastewater treatment.



3.3.5. *Wastewater treatment*

Legislation in force

1985 Water Act and Royal Decree 1/2001 modifying this water act

Order of 25th of May 1992, modifying the order of 12/11/1987 relative to dangerous substances in wastewater discharges

Order of 26/10/1993 on the use of sewage sludge in agriculture

1995 National Plan for Wastewater treatment 1995-2005 (approved by Resolution of 28th of April 1995)

Decree-Act 11/1995 establishing standards for urban waste water treatment

Royal Decree 509/1996 on standards concerning wastewater treatment

Resolution of 14/06/01 on the National Plan for Sewage Sludge 2001-2006

Objective: Provide wastewater treatment according to EU requirements given the delays and ensure a better management of sewage sludge with more valorisation (re-use in agriculture). Regarding sewage sludge management, an objective of 80% valorisation of sewage sludge (254% compost, 40% agricultural use with treated sewage sludge, 15% of incineration with energy recovery, and 20% of landfilling) is fixed in Spain before 2007, planned by the National Plan for Sewage Sludge 2001-2006. A better control of wastewater discharges is envisaged.

Instruments: -*Prescriptions*- Sensitive areas (in which case advanced wastewater treatment is necessary), less sensitive areas (for which primary treatment is sufficient) and normal zones (secondary treatment) have to be determined by the 31st of December 1993. Treatment plants can work only after wastewater that enters and comes out of the plant have been sampled, controlled and are conform to quality standards. The control of discharges from wastewater treatment plants is established according to EU requirements (depending on the size of the p.e), and must be controlled by River Basin authorities and AC authorities.

By the 31st of December 2000, secondary treatment must be provided for wastewater (collected through a collective sewage network) in urban areas of over 15 000 p.e, and by the 31st of December 2005, secondary treatment must be provided for wastewater (collected through a collective sewage network) in urban areas between 2 000 and 15 000 p.e. Under 2000 p.e. an autonomous sewage regime is applicable (individual treatment system) by 2010.



In sensitive areas, tertiary treatment is necessary before wastewater can be discharged for urban areas of over 10 000 p.e.

Economic instruments: Investment plans are established in the National Plan for the development of wastewater treatment plants in the whole of Spain. Discharge fees (*canones de vertido*) are set up, collected and managed by River Basin Authorities. The charge is based on the value of the polluting unit and the pollution content of the waste, and concerns discharges of communities and industries to surface waters. The amount is of 3 euros /pollution unit. Households are not subject to this tax. The revenue is used for the improvement of the aquatic environment and the financing of communal treatment plants. Sewage treatment charges are organized and regulated by Autonomous Communities. This charge concerns discharges from households and industries to the sewerage (if this service is provided). The revenue helps finance the construction and operation of water treatment. There are no uniform guidelines for the calculation of the charge, which is often based on water consumption. The region of Catalonia has introduced a charge based on the pollution load.

Incentives: In order to encourage Autonomous Communities to implement regional plans, subsidies are given by the central government and EU (through EU Cohesion Funds) if Autonomous Communities establish a regional plan for wastewater treatment and put into place a water sanitation charge (*canón de saneamiento*)⁵⁷ in order to cover the costs of the construction and running of the wastewater treatment infrastructure. In 1999, the Cohesion Fund gave Spain 567.9 million euros for wastewater related investments, amounting up to 25% of the total investments, under the same conditions as developed in point 3.3. Total investments estimated in the National Plan amount to 6072 millions of euros for wastewater treatment plants, 535 million euros for effluent treatment and 60 million euros for research and development. Regarding sewage sludge, the Ministry of Environment gives priority to financing investments that are already co-financed by EU funds and are integrated in regional plans presented by ACs or local companies. Special attention is given to projects including preventive measures (reduction of dangerous substances in sewage sludge), re-use and recycling, polluter pays principle and projects that are financially viable (that generate

⁵⁷ The sanitation charge is usually based on the volume of water consumed. It is levied by ACs and local authorities. There are also additional taxes levied by municipalities that are fixed to recover the costs of the municipal sewage network.



revenues). The investments needed estimated in the National plan for sewage sludge amount to a total of 475, 7 million euros.

Information: every two years, ACs must provide information on wastewater discharges to the Ministry of Environment. Moreover, an information system has been developed on the control and follow up of the quality of continental waters in Spain, named SAICA (*Sistema Automático de Información de Calidad de la Aguas*). This is an integrated system of the treatment of information on the quality of continental waters, based on geographical data (control points, localisation of discharges and of water catchments, localisation of urban wastewater treatment plants, sensitive and vulnerable areas). It gives information on water quality and gives authorities (government, ACs , river basin authorities, municipalities) information and alerts on water pollution, and on the characterisation of wastewater discharges. The information collected is regularly diffused by the Ministry of Environment to the public (notably via internet) giving information on the state of continental waters throughout Spain.

Target groups: municipalities (responsible for the wastewater collection and treatment), households, industries, wastewater treatment operators.

Actors of implementation: Government, Ministry of the Environment, Autonomous Communities (establish regional plans for wastewater treatment and sewage sludge management), municipalities.

Action logic: The planning and financing of the development of wastewater treatment plants and sewage sludge management will enable to guarantee a better management of wastewater, and therefore enable a better quality of water resources and drinking water.

Effects: Concerning the *establishment of sensitive areas*, the documents were given by Spain quite later than authorized (it was given in May 1998, but demanded at the end of 1993). The documents refer to the identification of sensitive areas by some ACs (Catalonia, Galicia, and the Balearic Islands) but the specific areas have not yet been notified to the Commission: only Andalusia has officially identified sensitive and less sensitive areas by decree in March 1999. The documents sent to the Commission show that 120 Spanish agglomerations felt they required tertiary treatment for the protection of sensitive areas, representing only 8% of the

pollution load affect by the directive in Spain. A total of 35% of these 120 agglomerations were considered to be in conformity with the provisions of the EU directive (EC, 2002). Moreover, the list does not include many agglomerations situated in catchment areas of potential sensitive areas. According to A. Farmer (1999, p. 86), “the real criterion was to designate the smallest possible number of sensitive areas to facilitate compliance with the obligations established by the Directive for more stringent treatment”. At present, Spain has to face the European Court of Justice since 2001 as it has failed according to the latter to identify enough sensitive areas: most ACs have failed to formally identify sensitive areas.

Spain has also identified coastal waters as less sensitive (demanding only primary treatment for wastewater): The European Commission is against this as, according to the latter, agglomerations above 15 000 p.e. who discharge wastewater in sea need at least prior secondary treatment.

Regarding wastewater treatment plants, there has been a significant improvement of the situation in Spain regarding the percentage of contaminant discharges conform to the EU directive. The following table provided by the Ministry of the Environment shows Spain's progress in this matter.

Table 3-5: State of wastewater treatment

State of wastewater treatment (in % of p.e served)	1995	1998	2001	Diff (95/01)
Conform	41%	48%	59%	+ 18
Not conform but under construction	13%	16%	19%	+ 6
Not conform	46%	36%	22%	- 24
Total	100%	100%	100%	---

Source: MMA, 2002

This means that 59% of the population equivalent is served with wastewater treatment facilities. This also implies that another 40% needs to be conform before 2005. According to the INE (National Institute of Statistics), out of 8 381 184 m³/day of wastewater collected, 7 752 624 is treated and 773 895 is reused for the year 2000. Consequently, 628 540 m³/day is not treated before being discharged into water resources. But according to the Ministry of



Environment, in the case of cities without treatment or with inadequate treatment, plants are either planned or contract for their construction are being set up.

However, one must point out an important problem in this development of wastewater treatment: low cost recovery. The discharge fees (*canones de vertido*) set up to cover wastewater treatment infrastructure costs were poorly implemented: in 1997 for example, only 42 million euros were collected, representing 1,3% of the revenue paid by the water users. These fees only take into account authorized discharges, so one can imagine that there must also be numerous non authorized discharges in Spain. The first estimates provided by SAICA reveal that only 20% of discharges are officially authorized, which can be explained by the fact that the costs of sanction are inferior to the establishment of adequate treatment plants and the payment of the fee (Castillo López, 1999). This critical situation stems from insufficient and inadequate means to ensure the control, sanctions and implementation of the discharge fee in different ACs. At this point in time, this situation does not seem to have changed (Embid, 2002).

Regarding *sewage sludge management*, the implementation and success of the National Plan established in 2001 is a little too recent to analyse the impacts. However, one can at present observe that when establishing the plan, the ministry of Environment noted that in most Autonomous communities there was no information on the amount of sewage sludge produced and how these waste were managed. Only several ACs had information on specific treatment and management. In 2001, the Ministry of Environment however estimated (based on rough estimations regarding wastewater treatment facilities) the production of sewage sludge at around 800 000 tons (of dried matter) for the whole of Spain. Out of this total, 51% was estimated to be used in agriculture, 22% was landfilled, 4% was incinerated (some percentage could also have been dumped in the sea, which is now forbidden by EU legislation). This production should rise up to 1 300 000 - 1 500 000 tons (of dried matter) in 2005 with the development of wastewater treatment plants (under construction or planned). Therefore, one can imagine the significant efforts to make in order to properly manage sewage sludge, develop proper management schemes that seem to be nonexistent at the moment, develop composting, and treatment of sewage sludge in order to reduce its contaminating potential (bacteria, viruses...).

3.3.6. *Synthesis*

3.3.6.1. *Synthesis table*

Spain's water sector has been largely influenced by EU regulation concerning quality standards, wastewater treatment infrastructure and sewage sludge quality requirements.

If drinking water quality requirements seem to be met, there is still need for further efforts to conform to the urban wastewater directive and better organize sewage sludge management. Moreover, Spain suffers from serious problems regarding cost recovery: the government (and EU Cohesion Funds) contributes to investments, but the costs of infrastructure and water managing are not covered by the price of water. Discharge fees are not sufficiently paid, and there is great need for more numerous and qualified administrative personnel to control and sanction unauthorized practices regarding both nitrate pollution and wastewater discharges in water. In addition, irrigators pay a very low price for water, which does not enable a better use of water and a more pronounced focus on demand management. Spain has not completely escaped the hydraulic paradigm based on the supply of water, and has not yet adopted a clear policy integrating the real costs of water management. Neither the quantity nor the quality of water are reflected in the actual price of water: the polluter pays principle is not implemented and the scarcity of the resource is not sufficiently reflected upon. Incentives have however been set up in order to promote a better financing of wastewater investments: for example, the National Plan gives subsidies under the condition that sanitation fees enabling to cover investment costs are implemented.

Table 3-6 summarizes the characteristic features of the different sectors of the water sector.



Table 3-6: Synthesis for Spain's water sector

Water cycle Public policy	OBJECTIVES	INSTRUMENTS	TARGET GROUPS	ACTORS OF IMPLEMENTATION	EFFECTS
1. Resource access	1) Preserve natural water (potential drinking water) against pollution and improve its quality 2) As water resource in Spain faces problems of scarcity, water transfers are encouraged.	<i>Pr.</i> Police zones, protection parameters around water resources, authorizations and concessions are given for the use of water; planning is set up for water transfers (nation Hydrological Plan) <i>M.</i> Markets are set up to enable water transfers <i>Eco.</i> Water abstraction charges and charges on the use of water resources	Water producers, residents, farmers using irrigation and husbandry, other actors needing concessions (water sports...)	Government, Ministry of the Environment, River Basin Authorities, municipalities and irrigation communities	• Low cost recovery for resource use (low water price for irrigators) • Poor protection of water resources (nitrate pollution)
2. Production	Limit pollution upstream from agriculture and industry and have sufficient infrastructure and safe techniques to produce good quality drinking water.	<i>Pr.</i> UNE-EN standards are imposed on substances used for the treatment of water <i>Inc.</i> infrastructure costs are provided through government subsidies and EU funds. <i>Self reg.</i> Companies that manage water production are responsible for the control of water quality.	Water producers, farmers, households	Government, municipalities, autonomous communities	• Growing efficiencies in catchments • Poor implementation of protection parameters around catchments.
3. Distribution	Provide safe drinking water	<i>Pr.</i> Fixed parameters on water quality <i>Self reg.</i> Quality controls at different stages of production and distribution (including at the tap) <i>Eco.</i> water prices based on fixed or binomial tariff, and can also include social tariffs (ex: Barcelona) <i>Inc.</i> important water supply infrastructure subsidies (50%) <i>Info.</i> Information system (SINAC)	Water distributors, subscribers, municipalities (price setting)	Government, Ministry of Environment, Ministry of Health, water distributors (auto-reg), municipalities	• Quality parameters have been fixed • Distribution networks need to be improved
4. Sewerage	Preserve the quality of surface and groundwater and organize wastewater collection	<i>Pr.</i> Development of sewage collection systems for p.e. above 2000. Restrict ^o imposed on discharges and on dangerous substances. Nat. and reg. planning regarding invts in sewage infrastructure. <i>Inc.</i> subsidies (25%) given by the govt. and EU Cohesion Funds <i>Eco:</i> sanitation charge to cover invt. costs	Municipalities, households, industries	Ministry of Environment, ACs, municipalities (competent in sewage networks)	• Connection of population to sewers has doubled in the last ten years
5. Treatment	Provide wastewater treatment according to EU requirements and a better management of sewage sludge	<i>Pr.</i> Secondary treatment for wastewater in urban areas over 2000 p.e., sensitive areas must be set up, invt plans for wastewater treatment and sewage sludge managt (80% valorisation objective) <i>Inc.</i> subsidies (25%) given by the govt. and EU Cohesion Fund <i>Eco.</i> Discharge fees and sewage treatment charges <i>Info.</i> Control and information system: SAICA	Municipalities, households, industries, wastewater treatment operators	Govt, Ministry of Environment, Autonomous Communities, municipalities	• Too few sensitive areas established • Clear increase in wastewater treatment plants

3.3.6.2. National model

The Spanish water model resembles the French one predominantly based on concession contracts that developed with growing technical standards necessitating increasingly complex know-how and important investments that municipalities had difficulties in assuming alone.

According to Mercadal (1997), the essential engine driving privatisation was not the efficiency offered by the water companies nor the quality of the service, but the money collected in advance rates⁵⁸: almost all privatisations originated from the need of municipalities to obtain economic resources to face debts. For example in 1995, 1996 and 1997, private companies gave around 210 million Euros to local entities through advanced rates of concessions for water supply services.

The Spanish water system is based on practically free water (regarding notably irrigators) and subsidies (Embíd Irujo, 1997). Moreover, as one may have noticed throughout this study, there is a void concerning regulation on privatisation processes. Contracts are established in an erratic way: every municipality does what it wants. Some privatise management for 4 years or more: the bases established for tenders do not have any common denominator (Cabrera, 2001). Another feature is that most small towns in Spain (below 5 000 p.e.) are less privatised.

One must also point out that there are regional differences from one autonomous community to another, from the point of view of water management, water availability and transfers, and laws (considering the variety of Autonomous Community Acts).

⁵⁸ Advanced rate: a payment that private concessionaires must give to municipalities, equivalent to one year of invoices. Companies also pay an annual rate equivalent to 50% of the yearly invoices. This means that operators have “to manage themselves in accordance with investments already established, to improve technology for supply, to improve sanitary and quality conditions, and to have more than 50% of incomes in order to obtain some profits” (Mercadal, 1997)

3.4. FUTURE TRENDS IN WATER PLANNING AND MANAGEMENT

3.4.1. *Emerging legislation*

Law 13/2003 governs the financing of infrastructure projects and enters into force on the 24th of August 2003. It introduces a new section to the existing Public Administration CO tracts Law (RDL2/2000), dealing in much more detail with the regulation of public works concession agreements. The aim is to encourage private financing by permitting certain financing techniques and improving protection available to financing parties. This enables more and more financing of hydraulic works through private capital. This on-going trend has also developed with the constitution of “State companies” geared towards facilitating the participation of private capital in the execution of hydraulic works as well as the management of all phases of the hydrological system from exploitation of underground waters to the treatment of waste, set up in the Ebro, Sur, Dureo, Júcar, Segura, Gudana and Guadalquivir basins. The aim of these companies is to reduce mid and long term participation of the State in financing infrastructures. Competencies and specific financing conditions are established in the statutes of each one of these new companies. Therefore there is a clear trend towards an increase in private management of public works; this enables to face the crisis of public financing of public works caused by a sustained reduction policy in public deficit, the decreasing Structural and Cohesion Funds of the EU (they have dropped by 25% for 2000-2007 on the 2000 Agenda) and Spain’s possible exit from these funds in the short term, especially on account of the entry of Central and Eastern European countries (del Moral, 2000).

Regarding the future implementation of the Water Framework Directive, this has not yet been transposed in Spanish legislation. In order to comply to its requirements, Spain will need to change significantly its water policy notably regarding the following points:

3.4.1.1. *Principle of environmental protection and sustainable use of water*

This is not always a predominant concern in the Spanish water policy: if laws exist, they are very poorly implemented. As the first working package mentions, the lack of political willingness towards the application of existing laws has led to a spiral growth of urban,

touristic and agricultural water demands, notably along the Mediterranean coast, which goes against demand management and the protection of water quality and resources.

3.4.1.2. Full cost recovery

Spain's farmers get water almost for free (around 0.12 euros/m³/year), and the National Hydrological Plan sustains this use of water regarding intensive agriculture in the South. This is not in accordance with the directive: according to article 9(1), Member states have to take into account cost recovery of water services (including environmental and resource costs). The application of full cost recovery would induce a tenfold increase in the price of water for irrigators, which would have devastating effects upon irrigators: 300 000 farmers could go out of business (Saurí and Del Moral, 2001).

Regarding the National Water Plan leading to massive water transfers, this also is not always compatible with the directive's requirements. Associations like Ecologistas en Acción and EEB contest the Spanish Hydrological Plan and EU funding: if the European Commission supports the Spanish Water Plan by granting EU funds, this would imply that the EU finances the infringement of its own laws. Contrary to the Spanish Water Plan, the EU Framework Directive requires careful environmental and economic tests to be made and the search for better alternatives before such a National Plan may be carried out.

3.4.2. Overall trends regarding liberalization

A high degree of liberalization has been reached in Spain with growing private sector involvement and the creation of water markets, water banks and the pursuit of water transfers through the National Hydrological Plan. This undeniably signifies a “commodification” of water, or what Spanish call “*mercantilización del agua*”. Water markets and banks should be relatively local, consisting in exchanges within irrigation communities, between different users of a reservoir (that is between upstream and downstream users with a river basin). In contrast the National Hydrological Plan's logic is that of state-led water resource transfers, expanding the central State's role in water resources administration and provision (Bakker, 2002).



Water liberalization must be seen in a more general perspective of the liberalization of network services in Spain. The period of the Socialist party (PSO, *Partido Socialista*) was marked by the obligations entailed by Spain's entry in the EC and poor public finances; therefore the government initiated a process of public sector "sanitation" (Bakker, 2002), including partial privatisations of public enterprises. This was followed by the more right-wing *Partido Popular* policy in 1996, including a coordinated plan of "total privatisation". The majority of public companies were to be sold off by 2002 in order to reduce the public deficit. As Bakker notes, privatisation was "a planned process undertaken with the goal of liberalising the Spanish economy, and a key tool for boosting the global efficiency and competitiveness of the Spanish economy" (Bakker, 2002, p. 782).

By the turn of the millennium, Spain's liberalisation process has overtaken many other EU countries. If this is true for water management, it is also very much observable in other network services.

Regarding *energy markets*, liberalisation of natural gas was established by the Hydrocarbon Law (*Ley de Hidrocarburos*, BOE, 1998). Despite this policy, one company, *Gas Natural*, remains the dominant natural gas supply company with around 80% of the market. As for the oil industry, liberalisation developed with the Oil Industry Law in 1992 (*Ley de Ordenación del Sector Petrolero*, BOE, 1992). All aspects of the oil market were liberalised, but the government continued to intervene in the price structure. The Spanish Electricity Act of 1997 (*Ley de Ordenación del Sector Eléctrico*, BOE, 1997) went further than the EC directive and in a shorter time span. All elements of the electricity supply system were privately owned by 2002, except for the public holding of the electricity grid operator (Salmon, 2002). One can therefore remark a very strong start for energy markets except for the coal market that remains heavily protected.

As far as the liberalisation of *postal services* is concerned, the Spanish Postal Service *Correos y Telégrafos* was one of the most liberal in Europe, so the European Postal Directive of 1997 (transposed in Spanish law in 1998) did not make much difference in Spain. Competition already existed for letter and parcel services, and a variety of financial products were already proposed to the client.

As regards *rail transport services*, operation and infrastructure remains largely the responsibility of the public company *Renfe*. The construction, financing and management of new lines has been using more and more private funding.

The telecommunications policy in Spain was mainly driven by the requirements to meet European Directives and WTO commitments. Internally, liberalisation was “prompted by the desire to reduce inflation and pressure from consumer groups and competing companies” (Salmon, 2002, p. 13). The 1996 Directive on the implementation of full competition in EU telecom markets, transposed in national law with the General Telecommunications Law 11/98 of 1998, led to the full privatisation of the national monopoly company *Telefonica*. However, the latter still dominates the market with over 80% of the fixed line market.

3.5. CONCLUSION

Spain’s water policy can be defined as a highly liberalised one (and this is also the case for some network services), with the existence of water transfers, water markets and important private participation both regarding hydraulic works and drinking water and wastewater treatment systems. Spain has made drastic efforts to comply to EU requirements on water quality and urban wastewater treatment, but still suffers from a lack of control and sanctions regarding water pollution...

This country will have to face important changes if it wants to conform in the future to the new framework directive, as regards cost recovery which is low at the moment in Spain, and also resource protection...

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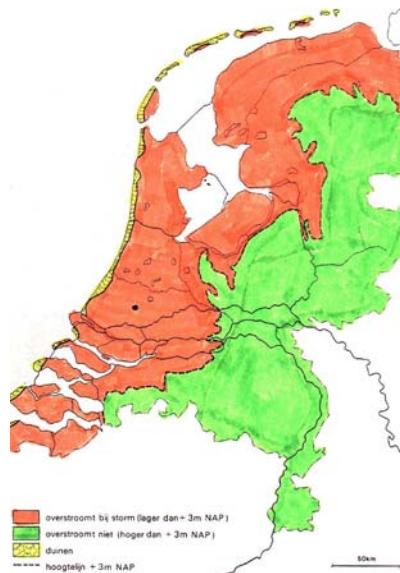
4. CHAPTER 4: COUNTRY REPORT THE NETHERLANDS

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4.1. INTRODUCTION

Having some background knowledge of the historical situation and geographical location of the Netherlands can help in understanding the Dutch water sector. The unique geographic location of the Netherlands as a low lying, water rich country, at the mouth of the rivers Rhine, Meuse and Scheldt, has a great influence on how the water supply and sanitation sector is arranged.

Figure 4-1 Figure showing the Netherlands⁵⁹



⁵⁹ The red area indicates the area that is below 3m NAP, the green area is above 3m NAP (NAP = New Amsterdam Watermark)



‘Nederland’, the Dutch name for the Netherlands, literally means ‘The low country’. With a population of 16 million inhabitants spread over an area of 34,000 sq km, Netherlands is one of the most densely populated countries in the world. About 65% of its total surface and well over 8 million inhabitants would disappear under water were it not for the dikes.

The Netherlands, it can be said is predominantly man-made. The Dutch need continuously to adjust, make and keep habitable and prosperous their country by constant measures especially in the field of water management. The experiences with water management dates back to the thirteenth century. Since then, the various sub sectors have developed independently and are differently regulated and organised.

The water boards, which are responsible for water quality and quantity, were instituted during the middle ages. Primary regulation at that time was the protection of man against water. Later on the regulatory and legislative focus shifted very much toward the notion to protect water against man. This was particularly the case at the start of the 19th century, when the bigger cities in the Netherlands were confronted with the negative consequences of the Industrial Revolution. It was several decades after the first drinking water companies started functioning that the first wastewater collection systems were implemented through the municipalities.

In the period until today, the water supply and sanitation sector has gone through a lot of changes but still there are some reflections of the past. For example with regard to wastewater treatment the water boards are still responsible and exist in the same administrative form although currently they are much more clustered than before. Water boards currently represent the oldest democratic form of governance in the Netherlands. At many water boards the executive bodies are still referred to by their traditional names. The governing body might be called the ‘verenigde vergadering’ (united assembly). The executive might be referred to as ‘college van dijkgraaf and hoogheemraad’ (board of water and high water councillors and dyke reeve). The chairman is often called ‘dijkgraaf’ (dyke reeve) or ‘watergraaf’ (water reeve). With regard to water supply the past is less dominantly present. The earlier private water supply companies have all been made public and are now operating as public limited companies under company law, but the waste water collection is still in the hands of the municipalities just like almost a 100 years ago.

This report contributes partly to a larger research project EUROMARKET. The prime focus for the EUROMARKET project is to identify scenarios for liberalisation of the WSS sector in Europe. This document is intended to serve as a steppingstone in the identification of trends in legislation and emerging regulations and thus aid in the development of scenarios. This document attempts to give a clear cut understanding of the following: who are the most important actors in the water supply and wastewater sector in the Netherlands, how has the Dutch water sector developed over the past 100 years, overview of the Dutch water supply and wastewater policies.

In the following sections an overview of the legislative and regulatory aspects of the Dutch water and wastewater sector will be presented. Firstly the water sector will be placed within the general institutional context of the Netherlands followed by an historical overview of the evolution of the legislation in the field of water and sanitation. Chapter 3 will analyse the policies for the different stages of the water cycle. Chapter 4 will emulate the future trends in the water planning and management. Finally the chapter 5 will draw conclusions based on the discussions and analyses of earlier chapters.

4.2. GENERAL FRAMEWORK FOR WATER MANAGEMENT

4.2.1. *Institutional Framework*

The Netherlands nowadays is described as a unitary decentralised state. The Dutch are famous for the degree of participation in the decision-making process and consensus approach, known as the “Polder model”. Three political hierarchical levels can be distinguished, the State, the Provinces and the Municipalities. A special feature of the Dutch system is the Water boards; these are special government units responsible only for water management.

Water supply and sanitation services are operated mostly at the local or regional level. Although the Ministries of Housing, Spatial Planning and Environment and the Ministry of Transport Public Works and Water Management are the responsible authorities in the end, daily responsibilities are decentralised. The responsible authorities for the water cycle are fragmented. The drinking water companies are responsible for the water supply. Municipalities and the water boards are responsible for the sewerage and the treatment of

wastewater respectively. The water boards and the Municipalities are democratic organisations. A water board can be described as a functional democratic organisation under civil law. The drinking water companies are constructed under company law. Public responsibility is arranged through the shareholders meeting. The shareholders are representatives from the Municipalities or Provinces. Besides being the most important shareholder of almost every Dutch water company, the State has delegated the supervision of the groundwater quantity management to the Provinces. The Provinces are authorised to supervise the groundwater extractions and are able to give or recall permission rights.

4.2.2. Resource status and Resource Use

Approximately about 15% of the surface of the Netherlands is covered by water. Ample amount of water is available under average conditions throughout the year. 63% of the total inflow originates from the river Rhine. Other rivers include Meuse, Scheldt and the Eems. All the rivers together contribute about 73% of all the inflow; rain is responsible for the rest of the 27% (Perdok, 1995). It may be worth noting here that the Netherlands is largely dependent of external sources for its surface water needs.

About one third of the drinking water is produced from surface water and the rest (two thirds) is produced using ground water (Kuks, 2003a). VEWIN (2002) reports the following figures of extraction for producing drinking water in the year 2001: ground water, 758 Million m³; river groundwater, 26 Million m³; natural dune water, 16 Million m³; surface water, 503 Million m³.

Drinking water companies use approximately 10 % of the total water extracted in the Netherlands⁶⁰. Depletion in the Netherlands is described as a serious threat in several policy reports. Farmers cause 60% of the depletion problems. Drinking water companies are responsible for 30% of the depletion effects (CIW, 2003).

In response to the falling groundwater levels (an average fall in levels of 20 cm), since 1950 there has been a gradual increase in the use of surface water to produce drinking water. This

⁶⁰CBS 1996 Water usage in the Netherlands is approximately 10 milliard m³

increased dependence on the surface waters has resulted in a drastic change in the way the water companies view the pollution of potential water sources. They are becoming more and more proactive in fighting pollution and have thus positioned themselves as "environmental watchdogs" (Blokland et al, 1999).

4.2.3. General description of the history of water laws

The Netherlands is famous for the management of the water system since the 11th and 12th century. In the 13th century democratic district water boards were established to manage the water systems on a very decentralised level.

When compared to the long history (since medieval times) of management of the water systems, the water supply and sanitation services can be considered recent developments. In the second half of the 19th century the first Dutch drinking water companies came into being in the larger Dutch cities. The collection and treatment of wastewater started even later.

In the evolution of the legislation for the Dutch drinking water and sanitation sector several phases can be defined:

Phase 1: from 1850 – 1900: introduction of the drinking water supply companies

Phase 2: from 1900 – 1950: widening of the networks

Phase 3: from 1950 – 1970: institutionalisation of the water supply sector

Phase 4: from 1969 – now: Integration and harmonisation

The Table 4-3 on page 125 gives an overall view of the development of policy design concerning water supply and wastewater sectors in the Netherlands. The table tries to systematically chart the information available through the descriptions of various phases outlined above.

The Table 4-1 on the following page lists the relevant and important Acts, policy plans and decisions in the Dutch Water management field. Also listed are the relevant European Union directives on water supply and wastewater.

*Table 4-1 History of regulation*

Dutch Water legislations	EU Water legislations
1875 Nuisance Act	1975 Council Directive concerning the quality required of surface water intended for the abstraction of drinking water in the Member States (75/440/EEC)
1900 Water Administration Act	
1935 Acts of Goods	
1954 Groundwater Act	
1957 Water Supply Act	1976 Dangerous Substance directive (76/464/EEC)
1960 Water Supply Decree	
1968 First water management Plan	1980 Protection of groundwater against pollution caused by certain dangerous substances (80/68/EEC)
1969 Pollution of Surface Waters Act (WvO)	
1981 Revision of the Ground water Act (concession system for all users)	1991 EU nitrate directive (91/676/EEC)
1986 Soil Protection Act	1991 Urban Wastewater Directive (91/271/EEC)
1989 Water Management Act; First National Environmental Plan	1998 Drinking water Directive (98/83/EC)
1992 Water board Act	2000 EU- Water Frame Directive (2000/60/EC)
1993 Environmental Management Act	2001 Decision on Priority substances in the field of water policy (2455/2001/EC) amends 2000/60/EC)
2000 Revision of the Water Supply Act	
2001 Fourth National Environmental Plan (NMP4)	
2001 Water Supply Act decision (quality norms)	
2002 Discharge Decision (according the WvO)	

4.2.3.1. Phase 1: Introduction drinking water supply companies (1850-1900)

The birth of the drinking water sector, Klostermann (2003) claims, happened in the year 1851, when King Willem the third, gave permission to establish the first Dutch water company in Amsterdam. Remarkable is the fact that the Dutch financed only 4.3 % of the costs. The company was for more than 95% financed by English capital. Concessions replaced the ownership of a Dutch family. The Municipality Law of 1851, declared public health was a task of municipalities. In the wake of the severe Cholera epidemic in 1866 the Dutch government installed a state committee to look into the matter. The committee in its report to the king gave its ideas for legislation and quality control. The report and its suggestions were disregarded by the national government. Rotterdam and The Hague installed their water supply networks two decades later than Amsterdam. Instead of the private capital as was used in Amsterdam, The Hague and Rotterdam used public capital to finance the investment. In 1897 during the second Dutch public Health Regulation (Congres voor openbare



Gezondheidsregeling) drinking water requirements were formulated. At the end of the 19th century almost all Dutch major cities had a public drinking water distribution network including Amsterdam.

4.2.3.2. Phase 2: Widening of the networks (1900-1950)

In 1901 the first Health Act had been framed, whereby supervision of the drinking water quality would have to be accomplished by the national government. During the period of 1900-1935 water quality requirements are described in the Acts of Goods (Warenwetten). According to the Act of Nuisance (Hinderwet) drinking water companies were obligated to have a “ licence of nuisance”. Regulation was also framed to compensate the negative effects of public water supply to private owners. To stimulate a growth in the number of connections and harmonisation, national regulation was implemented in 1927. Every house, it was stated should have some sort of water supply, like a rain cabin, a Norton well or a connection to the drinking water supply system. A connection to the supply system was obligated if a new house was built near (maximum 40 meters) the existing network (Gunther, 1934, p135).

Besides drafting regulations, the State also provided subsidies and loans for smaller Municipalities to finance drinking water treatment plants and supply systems. The subsidies resulted in an increase of drinking water connections in the first half of the 20th century. Klostermann (2003) quotes Leeflang (1974) that in 1940, 75% of the Dutch citizens had access to drinking water supply. Sewerage system development was taken up several decades later. However, already in 1940, 49% of the Municipalities did have a sewerage system.

4.2.3.3. Phase 3. Institutionalisation of the water supply sector (1950-1970)

The provinces, water boards and municipalities have historically had an autonomous jurisdiction. This autonomy has, since the Second World War been framed more and more by a model of close cooperation with the central government. The central government has since then been taking the initiative of policy-making and the authorities cooperate by additional policy-making and implementation within the national policy frames (Kuks, 2003a, p3).

The Groundwater Act (1954) created a concession system for water suppliers, which had been a start of a process towards the institutionalisation of the public water supply. The growing demand for drinking water required the water companies to search for new raw water sources.

Because of the importance of the drinking water service landowners had to allow extractions even if the withdrawals would negatively affect their property (Kuks, 2003a, p13). Legislation about the institutional setting and the supervision of water supply companies were framed many years later.

It was not until the year of 1957 that the institutional setting of water supply companies was regulated and the service levels were set in the Water Supply Act (Waterleidingwet). In 1960 the water supply decree was published which supplemented the Water Supply Act by specifying the technical, hygienic, medical and administrative implementation measures concerning the Water Supply Act. At that time the water supply company of Amsterdam already existed more than a 100 years. Before the Water Supply Act was installed every Province had its own regulation and concessions, without the State's interference.

The Water Supply Act and the Groundwater Act increased the harmonisation of the Dutch water supply and sanitation sector. This harmonisation process of the WSS sector and the dominant presence of the relationship between water and health was set through in the year of 1968 when the first water management policy plan was made. This water management policy plan focused on the protection and the management of the quantitative water resources especially from the health perspective.

4.2.3.4. Phase 4. Integration and harmonisation (1969 - now)

In the fifties and sixties wastewater became an important issue not only in the Netherlands but also in many other western European countries. The international focus on the quality of surface water contributed to the introduction of the Pollution of Surface Waters Act in 1969. Until now the Pollution of Surface Waters Act is the main legislation to control surface water quality, setting up a funding and a permit system. The funding system is designed for full cost recovery of the water board's water quantity charges (Kuks, 2003a). Section 23 of the Pollution of Surface Waters Act specifies the use of the revenue from the levies; finance its own surface water pollution control measures, pay levies imposed on it by others and make payments towards costs incurred in order to take measures for prevention of pollution of surface waters. Before the introduction of the Pollution of Surface Waters Act 8 million pollution equivalents were already treated. Since 1969 the treatment capacity rapidly increased towards 24 million pollution equivalents in the year of 1995 (Verhallen et al, 1998).



In line with the need to address the issue of increasing importance of sewerage and wastewater treatment, in the year 1992, the Water Boards Act was brought into force.

The Soil Protection Act was put forth in the 1986 in order to tackle the pollution from diffuse sources. The act contained two protection levels, general and specific. The general protection level is filled in at the national level via General Administrative Orders (GAOs). The GAOs cover diverse causes of pollution such as spreading of manure on soil, discharge of liquids into soil or groundwater, application of sewage sludge or organic waste or compost on soil, dumping of solid waste material and artificial recharge of aquifers. The specific protection level measures have been transferred to the Environmental management act as of 1999. For groundwater protection the act stipulates that the provincial council draw a provincial plan once in every four years. The plan needs to put forward a provincial environmental policy and also identify areas that may need special protection (Put, 2001).

In contrast with the freedom of the water companies to access raw water sources in the fifties of the last century, the Groundwater Act from 1981 provides protection rules for farmers who are affected negatively due to the ground water abstractions by describing access restrictions. Moreover Provinces are allowed to have groundwater extractions charged. The income of these provincial charges should be used to anti-desiccation measures. The development of a broader perspective towards water management is also recognisable in the Constitution Revision of 1983, which proclaimed that the public domain should be dedicated to the protection and sustainable improvement of the living environment, including the natural water system. The same year a right of competence for the water boards was established in the constitution revision, providing them a position in the Dutch administrative model, equal to that of the competencies of Provinces and Municipalities, but restricted to functional administration in the field of water management (Kuks, 2003a).

In the field of water policy, the Netherlands started a planning tradition in 1968 already, with a First National Water Policy Document, followed by a second one in 1984, a third one (the first integral water policy plan) in 1989, and a fourth one in 1998. The Dutch system of integrated water management, adopted in 1985, takes account of all the many functions fulfilled by water systems in the Netherlands. Also around 1985, the Dutch environment department has adopted ‘consensual steering’ as one of its main policy strategies, which



means that policy target groups were consulted and committed to environmental policy goals and to policy implementation by means of policy agreements. An integral vision on water management, based on the regional water system approach taking into account ecological aspects was put forth in the same year. These various legislations were moves towards the organisation of water policy planning in order to complete the system of legislations allowing an ecological protection of water systems (Kuks, 2003a). These plans also point out the broader view in the water management policy process.

The most characteristic development towards more integrated water management was the draw of the Environmental Management Act (Wet Milieubeheer) in 1993. The Act forms an integrated environment act, which replaces many former regulations. Only the Surface Water Pollution Acts has not been integrated. According to the Environment Management Act once in every four years environmental plans on national and local scale have to be produced. These plans are the guidelines for the future water policy. Different objectives related to the water sector are described in the Fourth Environmental Policy Plan: ‘A World and a Desire, working on sustainability’ (Een Wereld en een Wil, werken aan duurzaamheid). One of them is to stabilise the drinking water consumption until 2005. After 2005 the increase may not be higher than the growth of the population⁶¹. Central principles are the “Precautionary and the Polluter Pays principle”. The general objective of the Fourth Environmental Policy Plan is to have and maintain a safe and habitable country and to maintain and increase healthy and flexible water systems so sustainable usage will be guaranteed in the future. To achieve this goal the plan plead an integrated approach towards spatial planning, water and environment focused on different interest such as agriculture, transport, recreation and fishery.

As a general observation, it needs to be noted that a new actor entered the Dutch stage during this last period, namely the European Union. European legislation, especially in the environmental field, needed to be taken into account by the Dutch policy makers and implementers. European legislation needed to be incorporated into the Dutch legislation with sometimes consequences for the operations of the WSS sector. Especially the recent European

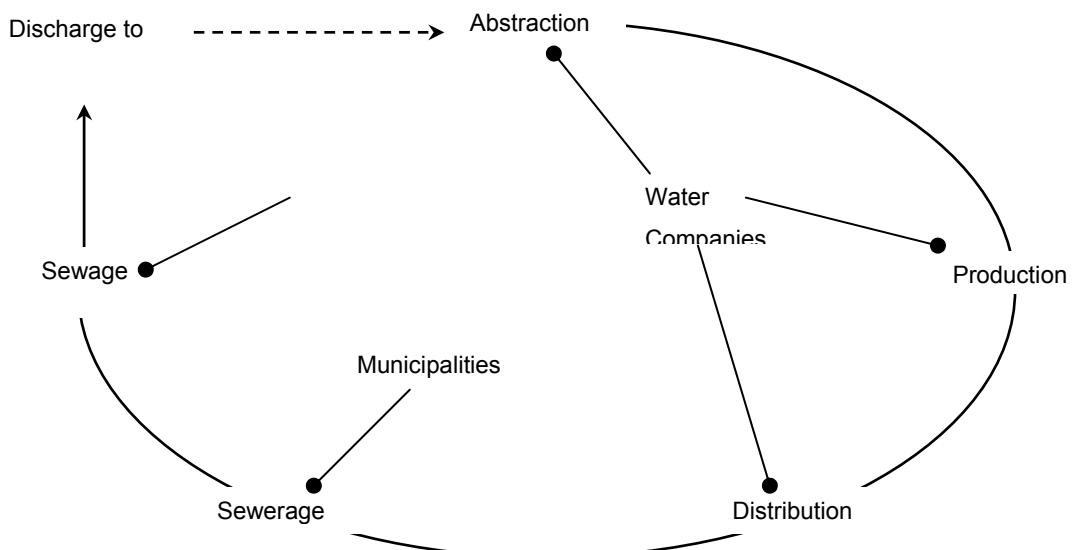
⁶¹Ministry of Spatial Planning, Housing and Environment, Nationaal Milieubeleidsplan 4, “Een wereld en een Wil ” pg 188

Nitrate Directive and the European Framework Directive poses several challenges for the Dutch (OECD, 2003)

4.2.4. Main Public and Private Actors Involved

In the Netherlands, different actors are responsible for different parts of the water cycle. The Drinking Water Companies are responsible for the water part of the cycle namely extraction/abstraction of water, treatment and distribution. The municipalities collect the wastewater and at the end of the water cycle the water boards treat the wastewater. This can be represented diagrammatically as shown in the Figure 4-2.

Figure 4-2 Water cycle and its relevant actors



Consequence of this division of tasks within the water cycle is that co-ordination of activities within the Dutch water sector is essential and strong ties are created between the different actors.

Two groups of actors can be identified in the Dutch system of water management. The primary actors are the ones that are directly involved in water management either by way of policy development or by way of execution. The state, the provinces, the municipalities, the drinking water companies and the water boards constitute this group. There is a second group of actors identified here that are involved in the water management tasks but less directly. The



representative organisations, VEWIN (association of drinking water companies), Unie van Watersschappen (association of water boards), VNG (Dutch organisation of municipalities), the banks, Dutch water boards bank and the Dutch municipalities bank and the private firms constitute this group. A diagrammatic representation of the organisation of the sector is included in the Figure 4-3.

4.2.4.1. State

The Ministry of Transport, Public Works and Water Management (V&W) and the Ministry of Housing Spatial Planning and Environment (VROM) are the two most important ministries involved directly in the WSS sector. The V&W is finally responsible for sewage treatment and surface water quality, while, VROM is responsible for drinking water and its quality. Inspectors from the VROM supervise the quality of the drinking water produced. The V&W and the Institute for Inland Water Management and Wastewater Treatment (RIZA) are the main preparatory bodies for new legislations/regulations (Perdok, 1995).

4.2.4.2. Provinces

There are in all 12 provinces. The provincial level is the one where most of the vertical and horizontal coordination of the government is concentrated. Most importantly the provinces are required to coordinate policies of the various sectors like the environment, transportation, nature housing, physical planning etc. The provinces receive the directives from the national level and pass it on to the municipalities and the water boards for implementation, but they may have their own policies. In addition to this responsibility the provinces also act as representatives of municipalities and water boards in front of the national government. Additionally to all of above mentioned, the provinces are responsible for the groundwater management, though not exclusively (Perdok, 1995). Provinces also are shareholders in the water companies and have the power to either establish or abolish a water board.

4.2.4.3. Municipalities

Municipalities are responsible for the collection of waste and storm water. The Municipalities are represented by the Dutch organisation of Municipalities (VNG), who advice the Municipalities on request. In all there are 537 Municipalities as of now (2003). The Municipalities jointly with the provinces are shareholders of the water companies.

4.2.4.4. Water boards

The water boards are functional governing bodies, whose councils are elected by specific interest groups. The tasks and competencies of water boards can be summarised in two Dutch words: Waterstaatkundige verzorging (Article 1 of the Water Boards Act) meaning “taking care of the state of water infrastructure”. As such the responsibility of the water boards is by no means limited to only water infrastructure but extends also to surface water quality and quantity management too. Some of the water boards work on only one of these tasks i.e. either water quality management or water quantity management. Nowadays, as a result of the wishes of the government, water boards that used to perform either or the tasks are being encouraged to merge. The provincial council has the power to establish or abolish a water board. The water boards operate on the triplet "interest-pay-say", which means that those who have an interest and who pay have a say (through elected representatives) in the water board council (Perdok, 1995). About 20 of the 48 water boards, which take care of water quality only are participating in a voluntary benchmarking like exercise, used more as a ranking system for various price and effect performances (Kuks, 2003b).

4.2.4.5. Drinking water companies

Most of the drinking water companies in the Netherlands are based on a mode of organisation where the utility is incorporated as a limited company under the company law, but local, provincial or national government holds the stocks. The essence of the Public Water PLC, as it is often referred to, is that it uses company law as a buffer, shielding water services from the burdensome public sector rules and regulations (Blokland et al, 1999).

Table 4-2 Drinking Water companies in the Netherlands

	Years				
	1991	1996	2000	2001	2003
Number of water companies	52	32	24	22	17
Drinking water connections	5749	6082	7042	7166	-
% Metered	93	94	96	96	100

Source VEWIN, 2002

The water companies are responsible for the continuous provision of drinking water in their respective areas in accordance with the Drinking Water Supply Act. In all there are 17 drinking water companies at the moment⁶², as in the past there is a trend of concentration, and the number may further fall (Perdok, 1995).]

4.2.4.6. VEWIN (Association of Water Companies)

VEWIN was formed in 1952 as a spin off from VWN. VWN, Cooperation between water companies was originally formed in 1899 and was founded with the primary aim of increasing knowledge between water supply companies. VEWIN is the main interest group for water supply companies. Its aim is to "promote a healthy development of public water supply in the Netherlands". Further it also seeks to promote the interests of the water companies as long as these interest do not conflict the earlier stated motive.

VEWIN is responsible for various activities like producing publications about various aspects of the drinking water sector; development of ten year plans (mid term plans), lobbying for the water companies for or against the government policies (Blokland et al, 1999). VEWIN is responsible for the system of benchmarking which looks at four aspects: drinking water supply, cost efficiency, environmental performance and service performance. As of 2001 this system of benchmarking has been made mandatory by a revision to the water supply act (Kuks, 2003b) VEWIN is also a member of the EUREAU, which is the European Union of National Associations of Water suppliers and wastewater services.

4.2.4.7. Unie van Waterschappen (Association of Water boards)

The Association of Water Boards (Unie van Waterschappen) protects the interests of the Water Boards at national level. All Water Boards are member of this association. On behalf of the Water Boards the Association is spokesperson to the parliament, public authorities and other organisations. The Association is a partner in issues of strategic water management and legislation. With the Water Boards, the Association looks for solutions to common problems (Unie van Waterschappen, 2003).

⁶² www.vewin.nl

4.2.4.8. RIONED

The RIONED Foundation is actively engaged in everything concerning sewerage systems in the Netherlands. The foundation is a cooperative organisation of public bodies, industry and educational institutions.

RIONED collates all information regarding the governmental, technical and financial aspects of sewerage management through surveys and other methods. RIONED is active in the development of cost-saving techniques and methods. This information is available to the municipal and other governmental authorities, which are effectively supporting the RIONED foundation, allowing them to implement their plans as efficiently as possible (RIONED, 2003).

4.2.4.9. Dutch Water boards Bank

Nederlandse Waterschapsbank N.V. (NWB) supplies services exclusively to the public sector, providing funding to provinces, municipalities and water control boards.

It grants long-term loans to public housing, healthcare and education institutions. In addition, NWB finances public water supply and environmental corporations. NWB is fully owned by public sector authorities. It finances its activities on the international money and capital markets, making use of financial instruments such as debentures, Medium Term Notes and commercial paper. The Bank's financial position is very strong and it has been awarded AAA ratings by Moody's and Standard & Poor's (NWB, 2003).

4.2.4.10. Dutch Municipality Bank

The Dutch Municipality Bank (Bank Nederland's Gemeenten) provides similar to the Dutch Water boards Bank financial services exclusively to the public sector. The State owns 50% of the shares while Provinces and the Municipalities together own the other 50%. According to the balance total the Dutch Municipality Bank is the largest public bank in the Netherlands (BNG, 2003)

4.2.4.11. Private parties

Privatisation of the Dutch water services has been in the past and is still a hotly debated issue. There are two parties: one pro-privatisation (industries and privatised energy utilities) and the



other against (drinking water companies and water boards). Although in the past there had been some privatisation in the drinking water sector (NUON), currently there is no privatisation. In the wastewater sector water board Delfland is in the process of finalising a DBFO contract for building a wastewater treatment plant at Harnaschpolder near Den Haag. This is the first of its kind in the Dutch water supply and sanitation sector.

4.2.4.12. Medium and Large Consumers

About 35% of the drinking water is supplied to industries termed as medium or large users. These account for 279,462 medium scale user connections and 4,294 large-scale consumers (VEWIN, 2002). The medium scale users consume more than 300m³/year but less than 100,000 m³/year. The large-scale users are the customers that consume more than 100,000 m³ of drinking water in a year. The large-scale consumers are organised in the VEMW (organisation which takes care of the interest of large scale consumers of water and energy). There is a tendency of pre treatment of wastewater from the industries, due to the presence of specific pollutants and also to lessen the pollution charges that needs to be paid.

4.2.4.13. Small consumers

The small-scale consumers account for about 60% of the water consumption. Since the mid nineties the average drinking water use per person slightly decreased. In all across Netherlands there are 6,881,837 connections classified as small-scale consumers (VEWIN, 2002). However because of the increase of the total population the net result is not significant. In the last decade the drinking water production has been stabilised as a result of the stabilisation of the consumption. For the small consumer sector the competition is lesser than for the industries. This is primarily due to the fact that the small-scale consumers are viewed as captive customers. The reason for this may very well be explained by the fact that the consumers are at the end of the distribution and the collection networks, which do not lend themselves particularly well to competition.

Figure 4-3 Organisation of water actors in the Netherlands

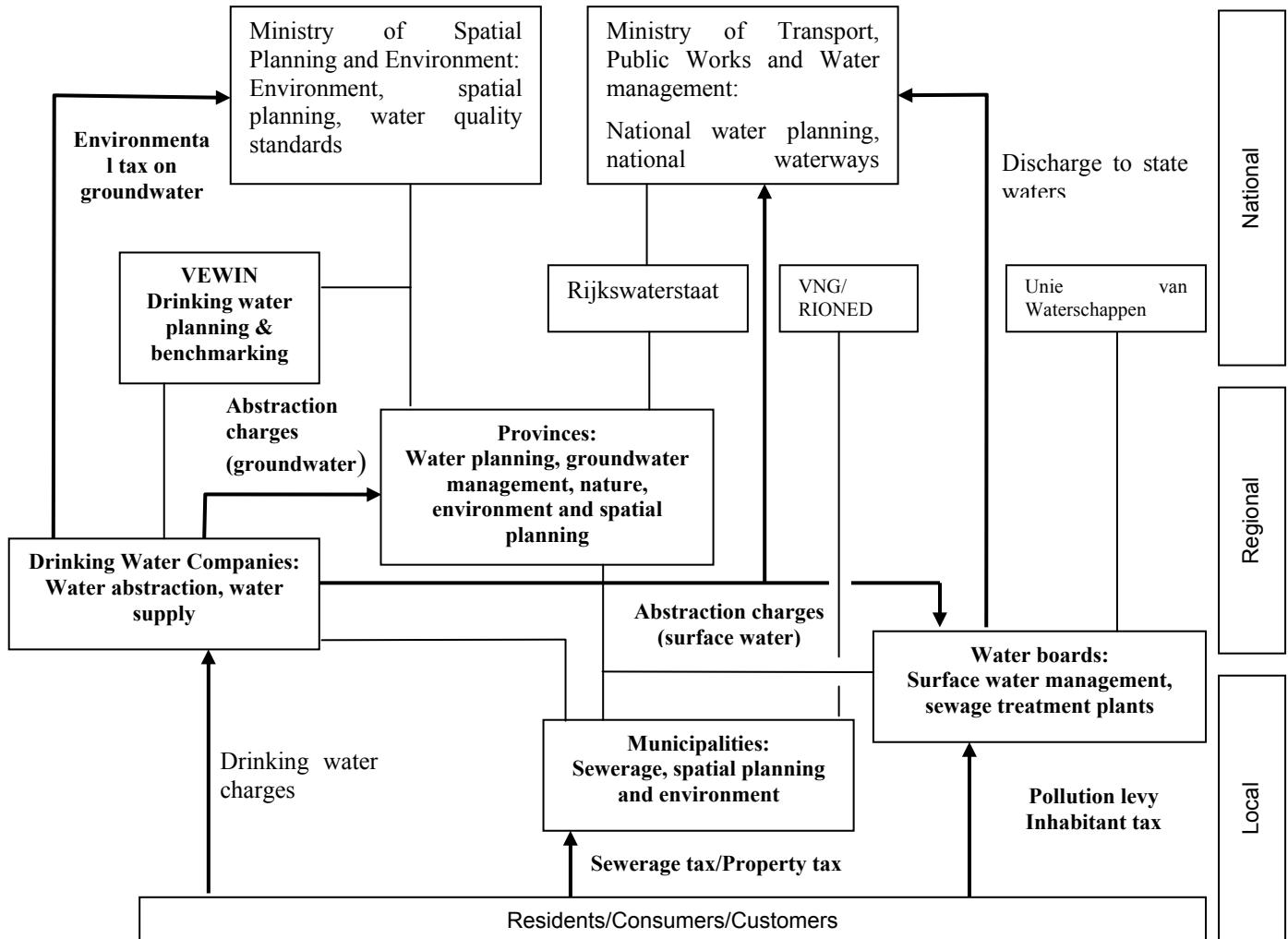




Table 4-3 Phases in the development of the policy design concerning water policy in the Netherlands

Phases	Policy Design	Actors of implementation
1. +/-1850 – 1900 Introduction drinking companies	<p><u>Objectives:</u> introduce drinking water treatment and distribution</p> <p><u>Causal Hypothesis:</u> Clean drinking water will decrease the number of infected people</p> <p><u>Instruments:</u> foreign, private and public capital to develop and exploit public water distribution</p> <p><u>Target groups:</u> urban citizens</p>	Foreign investors Urban communities Scientists Public health experts
2. 1900-1950 widening of distribution network	<p><u>Objectives:</u> organise a good water supply and improve public health for as many people as possible</p> <p><u>Causal Hypothesis:</u> Clean drinking water will decrease the number of infected people</p> <p><u>Instruments:</u> State subsidies and loans to expand the drinking water distribution services to the rural area, introduction of legislation about the quality of the drinking water supplies, national regulations for boosting the connection rate</p> <p><u>Target groups:</u> rural and population not served so far</p>	Central Commission of drinking water supply State agency for water supply(Rijksbureau voor Drinkwatervoorzieningen) Municipalities
3. 1950-1969 Institutionalisation of the water supply sector	<p><u>Objectives:</u> to supply sufficient water of a good quality for a growing population with an increasing living standard</p> <p><u>Causal Hypothesis:</u> harmonisation of legislations and increase living standard</p> <p><u>Instruments:</u> Legal framework and subsidies to expand the drinking water network, concession system for water suppliers, institutional set up and service levels specified in legislations</p> <p><u>Target groups:</u> drinking water supply companies and indirectly the entire population</p>	State Provinces Drinking water companies
4. 1969 - now Integration and harmonisation	<p><u>Objectives:</u> Ecological protection and sustainable usage of water systems</p> <p><u>Causal Hypothesis:</u> Healthy and flexible water systems will help to ensure sustainable usage in the future</p> <p><u>Instruments:</u> Pollution levies, Administrative orders, policy plans, environmental policy plans, charges on groundwater extractions,</p> <p><u>Target group:</u> polluters, groundwater extractors, farmers</p>	The Ministry of Transport, Public Works and Water Management Ministry of Housing Spatial planning and Environment Deputy States (gedeputeerde Staten) Water boards

4.3. SYNCHRONIC ANALYSIS OF THE LEGISLATION

4.3.1. Resource access

4.3.1.1. Property rights on the water resource

In 1992, the Dutch Civil code of 1838 was fundamentally revised in order to change the ownership of water to that of the waterbed. This meant that the water became a “res nullius” (no property). Hence water cannot be owned, not even by the state, because it is considered to be public (Kuks, 2003a). . However the government manages and controls the surface as well as the available groundwater. The Water Management Act and the Ground Water Act are the legal instruments that essentially administer the surface and the ground waters in the Netherlands (VROM, 1994). Surface waters completely encompassed in a single piece of property have a complete ownership right over it. Ownership of ground includes groundwater, as far as legislation does not stipulate, brought to the surface by a well or a pump, but is subject to limitations (Perdok, 1995).

4.3.1.2. Public Policy on the Resource

Legislation in force

Ground Water Act (1981)
 Soil Protection Act (1986)
 Water Management Act (1989)

Objectives

The fourth national environmental management plan points out international regulation on the quality of the rivers turn away the threat of a drinking water shortage (CIW, 2003). Corresponding to the objective of the Rhine Action Plan,⁶³ the condition of the Rhine should be such, so as to make it easy to purify the water in accordance with the European Union's Water Framework Directive's water resource standards. Besides surface water of the river

⁶³ RAN, Rhine Action Plan, 1987.

Rhine, the protection of the overall surface water availability is a major Dutch policy goal. This is primarily because the Rhine accounts for about 63% of the total inflow (Perdok, 1995).

Depletion of groundwater caused by extractions is still a big issue. Although the objective to decrease the depleted area by 25 % in the year 2000 had not been achieved the deadline for a decline of 40% (compared to 1985) of the depleted area in the year of 2010 remains the goal (CIW). Besides the groundwater shortage problems, objectives related to the groundwater quality are described in the Soil Protection Act. The purpose of the act is to prevent, limit or undo the change of the soil, which threaten or decrease the functional characteristics for human beings, fauna and animals⁶⁴.

Instruments

Provinces are qualified to manage the groundwater system although the Minister of Spatial Planning, Housing and Environment can advise them to refuse the permission related to the extraction permit procedure. According to the Groundwater Act, the Provinces are qualified to define regulation, which classifies the different extractors. Large-scale extractors are obligated to request a permit while small extractors (10 m³/hr) only have to be registered. Provinces are able to refuse a withdrawal. The provincial groundwater commission should motivate the decision made. Water board authorities coordinate the surface water permissions if the source does not belong to the "State waters". In the case of Rhine and the Meuse, which are considered to be state waters, the Rijkswaterstaat is responsible for the job. Policy at local or regional level should always be in concurrence with the national environmental and water management plan.

Water abstraction charges apply only to groundwater extraction in the Netherlands. Two taxes are being charged since 1995; the first one is being charged by the provinces and varies between 1-8 cents/m³. The purpose of this tax is to contribute towards the cost of research for developing groundwater policy plans. The second tax is charged by the finance ministry and is collected centrally as a part of treasury finances and is not hypothecated to the environmental purposes. Water companies pay about 34 cents/m³ under this new tax. There is

⁶⁴ Act of Soil Protection, article 1. 1986

a rebate of 28.5 cents/m³ in case surface water is injected into the groundwater prior to extraction. Extraction of less than 100,000 m³/annum have certain exemptions (Buckland and Zabel, 1998). Besides the State charges provincial charges per m³ are implemented. The costs are less per m³ in comparison to the State charges and should be used to prevent depletion and acidification.

Target group

The groundwater-charging instruments are introduced to change the behaviour of the farmers, and the drinking water companies. Besides the charges, the request procedure to get an extraction permit has the same target groups for surface water as well as for ground water.

Actors of implementation

The Ministry of Housing, Spatial Planning and Environment provide the legal framework according groundwater policy. Daily procedures are delegated to the twelve Dutch Provinces. During the decision making process Water boards and the Board of the farmers association may advise the Province to approve or to refuse an extraction request. The Provinces also administrate the amount of groundwater withdrawn and determine the discharge that has to be paid.

Rationale (overall approach)

Groundwater charges have been introduced to encourage the drinking water sector to change their raw water source from groundwater to surface water in order to promote sustainability of water resources.

Output and outcomes:

The implementation of groundwater charges has had little effect on the water companies to use surface water instead of ground water. The objective, a 10% reduction of the depleted and desiccation areas in the year 2000 has not been reached. According to the Third Environmental Policy Plan a 40% reduction of the depleted area in 2010 compared to 1985 is still realizable but requires an intensive effort from both Provinces and water boards. Because currently 10% of the total area of the country is affected by a permanent lowering of



groundwater tables the first outcomes can be considered weak (Kuks, 2003a). The amount of groundwater extracted as a part of the all water extracted for drinking water production has seen a minor drop and is about 62% as of 2001 (Versteegh and Biesebeek, 2003). Experts often argue stringent permissions rules are a much more effective instrument if the use of surface water has to be stimulated instead of groundwater. The quality of the surface water improved the last decade. However herbicides, like Bentazon, makes it sometimes impossible to extract from surface water (Versteegh and Biesebeek, 2003).

4.3.2. Production

Legislation in force

Water Supply Act (1957) and revisions (2000) and (2002)

Drinking water decision (2001, quality norms)

Policy Plan (for 30 years (VROM) and for 10 years (VEWIN))

Objectives

In the interest of public health a decent drinking water supply service should be guaranteed. Another policy objective is not to consume drinking water irrationally.

Instruments

Two types of prescriptive legislation can be distinguished. The first is related to the quality of the service provided and the other to the organisation of the drinking water supply service. The required quality and pressure are described in the Water Supply Act and updated in the Drinking water decision from 2001. According to the Water supply Act, drinking water companies are responsible to provide drinking water of the required quality. The government used to supervise the compliance to these requirements by way of annual inspections, these have now been discontinued and the supervision is now based on trust complemented by inspection. In very exceptional circumstances the government is allowed to bring about temporary closure of the water company if required (Lijmbach, 1996). As such if the water companies are not able to provide these services, the drinking water companies are obliged to inform the users. The drinking water companies are also obliged to collect and hand over the



information asked for by the VROM inspectors, which control the services provided.⁶⁵ Due to the low risk profile and a combination of government supported monopoly structure and government ownership the Dutch water companies borrow on very favourable terms and at interest rates much lower than other private firms. The Dutch water companies generally borrow from either the NWB, BNG or the commercial banks or pensions funds and insurance companies to finance their capital requirements (Blokland et al, 1999).

In the middle of the nineties of the last century a lot of awareness campaigns were organised. This has resulted in a stabilisation of the water usage while the population has increased within the same period.

Since 1997 the VEWIN started a voluntarily benchmark of the sector. The objective of this benchmark is to create quasi competition, to learn from each other and finally to become a more efficient sector.

Target group

Drinking water companies are targeted because they are obligated and controlled to deliver drinking water according the national law. But indirectly the whole population benefits from the high quality drinking water.

Actors of implementation

The Inspectorate for the Environment, a part of the Ministry of Housing, Spatial Planning and Environment is the responsible entity in the case of drinking water production and supply. VEWIN through its benchmark (water quality index in this case) also exerts pressure on the water companies to keep up the performance.

Rationale

Firstly, the drinking water requirements related to the substances and the pressure should improve public health and indirectly the human welfare. Further benchmark studies are intended to provide incentives for companies to improve performance.

⁶⁵ Vrom, Ministry of Spatial Planning, Housing and Environment

Outcomes

The drinking water service in the Netherlands is of a very good quality and almost never fails. The consumption per person is quite low related to other western European countries⁶⁶. The impact of the benchmark studies has not been described yet. The decrease in daily usage had not been expected, which resulted in the existing overcapacity. The decrease in environmental impact of this minuscule drop in the water usage has often been criticised as being only a very small improvement compared to the impact realised due to decrease in electricity and gas usage.

4.3.3. Distribution

Legislation in force

Water Supply Act (1957) and revisions (2000) and (2002)

Drinking water decision (2001, quality norms)

Policy Plan (for 30 years (VROM) and for 10 years (VEWIN))

Although production and distribution are both related to the customer behaviour the interaction between the customer and the drinking water company is discussed here. Both services (production and distribution) are provided by the same organisation and charged on the same bill.

Objective

The policy objectives for the drinking water distribution system are to provide sustainable drinking water distribution services to everyone and as a result improve the public health conditions. Other objectives are to operate the service according the cost-recovery principle and to stimulate efficient water use.

⁶⁶ OECD, Household water pricing in OECD countries, 1999. table 2 (The Netherlands 130 lpcd, Germany 129 lpcd, England 141 lpcd (metered))

Instruments

The act directs the water companies to supply wholesome drinking water to the users in quantities and pressures required, which may be specified in a Order in council, to protect public health. To perform this task properly they maintain the drinking water distribution system and are responsible for the condition of the distribution system. If there are problems in the distribution that might influence the quality of the drinking water delivered to the customers, drinking water companies are obligated to inform the users.

The Water Supply Act stipulates that plans made out by the provincial councils may require the water companies to supply drinking water in bulk to one or more water companies at prices that cover all the costs. Even when supplying water to its customers the water companies are expected to charge tariffs at cost recovery levels.

Self-regulation started in the year of 1989 with annual performance reports to improve efficiency. In 1997 the VEWIN started a Benchmark study, which has been executed three times by now. Different indicators related to water quality, services, environment and finance are collected and compared for more than 85% of the Dutch water companies. The benchmark study is used to increase the transparency of the performance of the companies and to provide an instrument, which can be used to improve the company's processes⁶⁷.

Target group

In accordance with the production part of the water cycle drinking water companies are targeted directly and the entire population benefits from the quality provided. The target group for the benchmark study are of course the water companies.

Actors of implementation

The Inspectorate for the Environment, a part of the Ministry of Housing, Spatial Planning and Environment is the responsible entity in the case of drinking water production and supply. VEWIN through its benchmark (Service; customer satisfaction index, Environment impact

⁶⁷Benchmark study "Water in Zicht", VEWIN, 1999

index and the finance and efficiency index in this case) also exerts pressure on the water companies to keep up the performance.

Rationale

The drinking water requirements related to the substances and the pressure should improve public health and indirectly contribute to the welfare of consumers. The rationale behind the introduction of the benchmark study is to increase the transparency of the drinking water supply sector and improve the possibilities to learn by comparing results.

Outcomes

The drinking water service in the Netherlands is of a very good quality. The organisation of the sector has not been drastically changed. Even third party access has been forbidden. The influence of the benchmark study towards this development is difficult to assess.

4.3.4. Sewerage

Legislation in force

Environment management Act (1993)
 Pollution of Surface Waters Act (1969)
 Disposal Decisions
 Municipalities Act (1992)

Objective

The objective is to protect the environment through operating wastewater efficiently and stimulate rational use of sources and taking care of reducing negative impacts to the environment or improving the environment. In the Netherlands all the environmental legislation is incorporated in two acts: the Environment Management Act and the Pollution of Surface Waters Act. The objective of these acts is to promote the purification and prevent the degradation of the surface water. For sewerage these objectives translate into avoiding the dilution of wastewater in the sewerage system by minimising infiltration, prevent groundwater pollution by leakage of wastewater from sewers and also to connect every



establishment and other wastewater producers to a treatment unit wherever possible in effect trying to minimise the number of direct discharges.

Instruments

Different prescriptive instruments are used to achieve the different objectives. The Environmental Management Act points out the Municipality is obligated to draft an annual environmental and a sewerage plan. This draft has to be publicly available and the Water boards are able to change it by putting in a petition. Besides the disposal decision, the Environmental Management Act describes regulation related to the domestic wastewater discharges. According these regulations houses within 40 meters from a sewer should be connected to it. In case of hard-to-reach individual houses subsidies are possible to install septic tanks. The Water boards are able to provide permits in such cases. A permit is always required when wastewater is discharged to the surface water directly. The kind of permit required is based on the grey and black lists stipulated in the EU's dangerous substances directive. It is prohibited to discharge wastewater other than domestic wastewater, rainwater or wastewater that has properties similar to that of household wastewater into the sewer system. The act delegates the responsibility of ensuring efficient collection and transport of wastewater to the Municipality. The Environmental Management Act, sewerage performance indicators are described, known as the "basic effort" (basis inspanning). They point out the required sewerage and pumping capacity in relation to the surface area. Another arrangement between the water boards and the Municipality is the connection permit in which requirements from the Municipality and the water board are described.

The Municipalities Act frames regulation related to the taxes a Municipality may charge for providing the sewerage service. According to article 219 the taxes may not be dependent on the income, profit or capital of the users. Sewerage taxes are not imposed in every Dutch Municipality. Some municipalities finance the sewerage from other public resources.

Being a government body the municipalities are able to get loans from the BNG, which lends at a rate lower than the commercial banks. In spite of this, the huge investments required in the sector coupled with the fact that the Municipal council will not always accept a huge increase in sewerage taxes represents a major challenge.

A sewerage benchmark has been introduced as an instrument to improve the efficiency of operation of the sewer systems in various cities/towns of Netherlands. On the initiative of a number of municipalities a foundation RIONED was formed which was entrusted with the responsibility of the benchmark itself.

Target Groups

Every discharge from industries, companies, citizens, public buildings and so on are targeted by the legislation described and has to be registered. Municipalities are obligated to charge a tax according the Municipalities Act.

Actors of implementation

In general the policies are formed at the Central Government level. Most relevant policies are generally originating from the Ministry of Housing, Spatial Planning and Environment (VROM). The water boards are also exercising some kind of a control on the municipalities in that they (water boards) can stipulate the quality and quantity of wastewater they will accept from any municipality.

Rationale

Providing prescriptive regulation, which frames the community obligation to discharge the wastewater improves the surface water quality and the environmental conditions.

Outcomes

Almost all of the population (98%) is connected to the sewerage system. Problems occur because of the condition and the existing capacity of the sewerage system. Because of leakages the wastewater collected by the sewerage system infiltrates into the groundwater. In many Municipalities the capacity available is not able to transport all the wastewater. Problems seem to grow because of the increase of inhabited surface area and the heavy rainfalls. Full cost recovery as described in the EU's Water Framework Directive of 2000 has not been achieved in the case of sewerage.



4.3.5. Treatment

Legislation in force

Pollution of Surface Waters Act (1969)

Water board Act (1992)

North Sea Act

Objectives

The major objective of the Pollution of Surface Waters Act is to combat and prevent the pollution of surface waters.

Instruments

The Pollution of Surface Waters Act came into effect on the 13th of November 1969 and laid down rules on the pollution of surface waters. The act is based on a two pronged approach to fight pollution of surface waters; discharges of polluting substances into surface waters were forbidden without a license and also levies were introduced on discharges according to the polluter pays principle. The polluter pays principle based approach acts as incentive to the polluters to minimise polluting discharges into surface waters as the levies are directly linked to the amount of polluting substances discharged.

To set up or operate any establishment a licence from the VROM is required. If in addition to this licence a licence for discharge of wastewater is also required, it needs to be applied for, thus helping to identify and charge polluters of surface waters. The industries and the households that cause pollution pay a (pollution) levy to the water boards, which are responsible for treating the wastewaters. The water boards use income from these levies to finance investments required to combat and prevent pollution. In addition to the income from the levies the water boards are also accessible to bank loans from the NWB or the BNG if required. Since the water boards are a government body they borrow at a rate lower than the commercial rates.

Since the year 2000, different water boards have been making comparisons between themselves by using a ‘treatment management benchmark’. Comparison of this kind is a

suitable instrument for demonstrating the effectiveness and efficiency of wastewater treatment management. Water boards not only use it in an attempt to work with greater transparency in the eyes of taxpayers but also to be able to compare action programmes in order to optimise treatment processes.

The water boards charges polluters of the surface and the ground water to protect the raw water sources. Inspectors of the Ministry of Spatial Planning, Environment and Housing analyse the soil conditions, which are remarked by the water boards or the Provinces.

Target Groups

Two different target groups can be distinguished related to wastewater treatment. Polluters are one target group of the regulation related to treatment. The different regulations are capable of charging the polluters and make it obligatory for them to ask for a permit if they discharge wastewater. On the other hand standards are set, which points out the quality norms of the effluent. Water boards are the target group of this legislation. If the water board is not able to purify the wastewater according the national or international regulation as applicable fines or charges need to be paid. As a last resort discharge permits can be withdrawn.

Actors of implementation

The water boards share the responsibility for the quality of surface waters with the Department of Traffic And Water Management of the Ministry of Traffic Public works and Water management. It may be noted here that the water boards are the regulators as well as the regulated. This is solely possible because of the democratic nature of the water boards, where by the elected representatives may exert pressure on the water boards in order to perform their social duties well.

Rationale

Taxation of discharges would decrease the amount of wastewater disposal. The delegation of the treatment responsibility to the water boards, which manage the surface water quality and quantity, stimulates an integrated approach.

Outcomes

Sixty percent of the wastewater treatment is not capable of removing nitrate according the European nitrate Directive. Investments are needed to perform according the international legislation. In general pollution levies are considered an effective incentive to reduce wastewater discharge (Bressers et al, 1993). During the period 1980-1991 the industrial and communal organic discharges to surface waters dropped by 51% (Buckland and Zabel, 1998). The point sources of pollution are well taken care of in the Netherlands; the diffused sources of pollution are a major problem.

4.3.6. *Synthesis Table*

4.3.6.1. *Table for comparison*

On the following page a table is presented that reflects a summary of chapter 3. For each element of the water cycle an analysis is provided in short statements of:

- The objectives
- The instruments
- The target group
- The actors of implementation
- The effects, divided in outcomes and outputs.



Table 4-4 Synthesis – The Netherlands

Water Cycle Public policy \ Water Cycle	Objectives	Instruments	Target groups	Actors of implementation	Effects
					Outputs & Outcomes
1. Resource access	Preserve/improve quality of potential surface drinking water resources and protect them against the pollution Manage the drinking water resource access Sustainable Groundwater management to tackle the problem of depletion and other effects	<i>Pr.</i> Permits required for withdrawals or abstractions <i>Inc.</i> Limitation of activities inside the prevention area <i>Inf.</i> Fees on groundwater withdrawals per m ³	Water producers, Farmers, Polluters	VROM, Provinces, Water boards	Little effect of groundwater charges on the water companies, a minor reduction in groundwater usage for drinking water production. Improvement in surface water quality.
2. Production	Contribute to public health improvement by providing good quality water in adequate but not excessive amounts	<i>Pr.</i> Drinking water quality and production requirements <i>Inc.</i> Temporary closure if required, due to non compliance of standards, Public loans from NWB, BNG <i>Inf.</i> Awareness building (television commercials and brochures), information to be provided to VROM inspectors <i>Self-reg</i> Benchmark studies held by the VEWIN	Water producers	VROM, Inspectorate for Environment, VEWIN	Very good drinking water quality, consumption low compared to other western European countries
3. Distribution	Sustainable Water Distribution Services Supply the water demanded Providing water of good quality to improve public health Efficient use of water Cost recovery	<i>Pr.</i> Drinking water distribution requirements Missions of public service Consumer informed of the quality of drinking water <i>Inc.</i> Public loans NWB, BNG Tariff setting <i>Inf.</i> Awareness building <i>Self-reg</i> Benchmark studies held by the VEWIN	Water companies VEWIN Municipalities Consumer registered at the public assistance	VROM, Inspectorate for Environment,	Drinking water sector firmly in the hands of the public sector, no drastic changes in the organisation of the sector
4. Sewerage	Preserve the quality of surface and groundwater Avoid problems of dilution in the sewers Improve connection rate with treatment plants Cost recovery	<i>Pr.</i> Environmental and sewerage plans for the municipality Prohibition on discharge of wastewater other than domestic wastewater and rainwater or wastewaters with comparable quality Capacity norms for the communal sewer and at the water board connection point <i>Inc.</i> Subsidisation to build individual septic tanks Public loans BNG Sewerage tax/charges <i>Self-reg.</i> Introduction of Comparative competition by RIONED benchmark	VNG Municipalities Industries	VROM Water boards	A very high connectivity rate of 98%, leakage from sewers may be a problem. Inadequate transport capacity of sewers in many cities. Full cost recovery not achieved in many cases
5. Treatment	Combat and prevent the pollution of surface waters	<i>Pr.</i> Discharges without a permit are forbidden Permits required to construct and operate any establishment including wastewater treatment plants <i>Inc.</i> Taxation of discharges, Public Loans from NWB <i>Self-reg</i> Comparative competition	Water boards Polluters connected to a sewer system	V&W Water boards	Point sources of pollution taken care of, diffuse sources of pollution are still a problem



4.3.6.2. National Model: Main Characteristics

Main characteristics of the Dutch model for the Water Supply and Sanitation Sector are:

1. The separation of responsibilities over various actors over the five elements of the Water Cycle. Groundwater resource access is mainly delegated to the 12 Provinces, for the surface waters the V&W and the water boards are responsible. The treatment and distribution of drinking water is the responsibility of the drinking water companies. These companies operate autonomously as limited liability companies, however the Municipalities and the provinces have a say in their functioning, as they are the main shareholders. Sewage collection is part of the Municipalities' tasks, while treatment of the sewage has generally been delegated to the water boards. The water boards also are responsible for the overall water management within their regions. Consequence of this division of tasks within the water cycle is that co-ordination of activities within the Dutch water sector is essential. And strong ties are created between the different actors.
2. A special feature of Dutch water management is the water board. Like the provincial and municipal authorities, the Water Boards are also decentralised government bodies. They are independent and have their own areas of authority. They can draw up regulations that citizens must observe and they can levy taxes. A Water Board only has one concern: the water management of a given area. A Water Board is therefore characterised as a functional administrative organ. An ongoing process of mergers between water boards slated to continue till around 2005 will result in a much smaller number of water boards and also result in water boards that can do both water quantity management and water quality management.
3. Service and performance levels of the actors within the Dutch water and wastewater sector are generally high. The drinking water companies are very reliable in their service provision. Also the water boards are executing a high level of performance. The weakest link within the water cycle is the collection of the sewage that is directly delegated to the Municipalities. For many years the point sources of pollution were seen as the major sources of pollution, but nowadays the situation is such that the diffuse sources of pollution are the dominant ones in adding pollution load on the surface and thus causing



eutrophication. The 4th National Policy Document on Water management and the Action programme on diffuse sources spell out the objective with regards to diffuse pollution. Identified priorities are in reducing agricultural emissions promote sustainable practices etc (Warmer and Dokkum, 2002).

4. The whole sector is firmly in the hands of the public sector. In this sense it is remarkable that foreign investors financed the first drinking water initiatives in Amsterdam. Currently there are only some small signs of the introduction of the private sector in the WSS sector, such as the initiative in Delfland with the DBFO contract for the wastewater treatment plant at Harnaschpolder near Den Haag.
5. Quasi competition in the form of benchmarking or comparative studies has been conducted in the drinking water sector, the sewerage sector and the wastewater treatment sector. The drinking water benchmark enjoys a participation of 90%. The water boards benchmark participation is limited to only those that perform the tasks of wastewater treatment and hence only 20 of the 48 water boards participate. In the sewerage sector the participation is much lower, as of the latest benchmark the participation level is just 39 of the 537 municipalities. As such the benefits or the effects of the benchmarking to/on each of the sectors is difficult to measure.
6. The influence of the European Union in the Dutch WSS sector has since the Nitrate directive become more tangible. Most of the earlier directives regarding emission and immission was more or less covered before in earlier Dutch legislation (European Commission, 2003). The Water Framework Directive influences particularly the institutional set up of the water boards, since they are currently not arranged according to the river basin principle and the need for trans national co-operation becomes more dominant.

4.4. FUTURE TRENDS IN WATER PLANNING AND MANAGEMENT

In the coming sections the triggers of change in the Dutch water sector will be described. The current as well as the emerging legislation is analysed. The chapter is finalized with the overall trends in the Dutch water sector.



4.4.1. Emerging Legislation

During the 1990s the hottest debate in the Dutch Water sector was that of liberalisation. In 1998 the V&W took the position that in principle it should be possible for the water boards to operate in a free market for the industrial and trade effluents while for the domestic sewage and small business wastewater the water boards should maintain exclusiveness. Similar intentions were stated by the VROM too. Eventually, though the cabinet decided to retain exclusive monopoly held by the water companies, but some provisions have been made for the large consumers (more than 100,000m³/year) to choose their supplier. The drinking water quality requirements in the European Water Frame Directive are of less importance for change in the water sector. The water delivered to the consumers is of a good quality and fulfilling the requirements. The introduction of cost-based pricing does have an impact, especially upon big-scale consumers. A development towards an increase in the price per m³ is seen⁶⁸. Furthermore, currently two discussions take place related to the freedom of the public owned drinking water companies. The first is related to the supervision of the drinking water tariffs. Nowadays the Provinces supervise the drinking water tariffs. Some politicians discuss if it should be better if the State supervises the tariffs. Drinking water companies and the VEWIN argue a comparative study should be conducted before a discussion on national supervision of the tariffs should take place. This discussion seems to be related to the question if the drinking water tariffs should be centrally regulated. Until now no clear answer can be given.

Recently introduced legislation and regulation arrange the transition of the responsibilities of the wastewater from the Municipality to the water board. Since 1995 the Municipalities are obligated to install a certain amount of sewerage capacity (m³) and pump capacity (m³/h) in accordance with the amount of urban surface within their area. This capacity should ensure the conveyance of wastewater to the treatment plant and limit the discharge of untreated wastewater to the receiving surface water bodies. A significant number of Municipalities have not installed the required capacities yet. Substantial investments are needed to expand the capacity especially if a separate sewage collection system needs to replace the current

⁶⁸ During discussions with the Vitens water company, it was mentioned that the company strives to keep the tariff raises to a rate smaller than the inflation rates.

combined system. Until now these investments has not led to public private partnerships as is the case with the wastewater treatment sector.

The fourth Dutch Environmental Act (NMP4) states that in the nearby future wastewater plans should be made by the water boards in cooperation with Municipalities. The objective of these wastewater plans is to provide an instrument that improves the relation between wastewater policies of the Municipality and the water boards.

Wastewater quality requirements described in the EU Nitrate directive are a trigger of change in the wastewater treatment sector. Many of the Dutch wastewater treatment facilities are not able to perform according the requirements, particularly for the Nitrogen compounds. Adjustments as well as investments are needed to improve the effectiveness of the treatment facilities especially related to the nitrogen norm. The European treatment standards, besides the increase in the number of purification equivalents and other reasons, are an important reason the water board of Delfland decided to install a new treatment facility. The enormous costs of the treatment facility with a capacity above 1 million purification equivalents triggered the water board to consider public-private partnership. Comparing the different options it is decided to out contract the treatment services according a design, built, finance and operate contract. The major question is if Delfland as a pioneer will be followed promoting more public private partnerships in the wastewater treatment sector.

4.4.2. Overall Trends

In this section the most important trends of the Dutch Water Sector will be described. First general trends are pointed out. The other topics are more related to liberalisation.

4.4.2.1. Scaling-up

The first, very clear statement, which can be made, is the scaling up of the drinking water companies as well as the Municipalities and the water boards. Especially the scaling up of the drinking water sector, from 220 in 1940, to 46 in 1990 and 11 nowadays has been a very fast development. Experts expect finally 4 to 6 companies will remain.

Important arguments that initiated this development process towards larger service areas are cost efficiency and the increasing knowledge that is needed due to the development of the technology.

4.4.2.2. *Benchmarking*

Not obligated by the State, but initiated by the VEWIN, the drinking water sector has been executing benchmark studies since 1997 on a three-yearly basis. The objective of the benchmark study is to increase the transparency of the drinking water companies' performance and to provide an instrument that can help to improve the company processes. The study analyses four topics; Water Quality, Services, Environment and Finances. The benchmark studies can be joined voluntary and until now the results are without sanctions or bonuses from the government.

In imitating the drinking water sector the sewerage sector recently executed a pilot benchmark study with a limited number of Municipalities. Thereupon an official benchmark "Het riool vergeleken" has been introduced. Of the current 537 Municipalities 39 participated in this benchmark. Related to the benchmark of the drinking water sector (more than 90% of the drinking water companies participated in the benchmark study) the participation is rather small.

The objective of the benchmark study in the sewerage sector is transparency and performance improvement. The first study is executed in 1999 and will be repeated periodically. All water boards responsible for the water quality participated in the project, which measured the performance in four categories: Functionality, Finances, Environment and Innovation.

About 20 water boards are participating in a voluntary benchmark like exercise, which is more of a ranking system for various and effect performances. The focus of the benchmark is on the proportional removal of phosphates and nitrogen from wastewater related to the tax rate per pollution unit, proportional costs of sludge transport and treatment and the proportional costs of water soil sanitation to remove historical effluent parts (Kuks, 2003b).



4.4.2.3. Liberalisation: Current State

According the Revision of the Water Supply Act (2000) drinking water services can exclusively be executed by public organisations. Since out contracting is not possible the freedom towards liberalisation is limited. However a couple of developments are worth mentioning. First comparative competition is introduced. Even though the results of the benchmark study is without consequences the existence of a benchmark study can be interpreted as a little step towards competition. Second is the provision in the Water Supply Act that allows large and medium size consumers (consumption more than 100,000m³) to choose their (public) supplier, thus in effect instigating competition between the various public companies. Thirdly, billing is often organised together with other public services such as cable, energy or telephone and can be seen as unbundling. The Municipality is responsible for the sewerage system. Because the complexity of the services increases more tasks such as design and the preparation of the obligated sewerage plan are contracted out to consultant agencies. The amount of out contracted work highly depends on the size of the Municipality. Daily operations are most of the time executed by the Municipality or inter-municipal operating departments. The administration of the sewerage service is often integrated with other communal duties.

The wastewater treatment sector can be regarded as relatively most open towards liberalisation. The enormous investments related to a new treatment plant in the service area of Delfland made the Water board decide to out contract the construction and operation based on a Design-Built-Operate-Finance contract. The water board will remain the supervisor of the consortia that will be contracted. It is difficult to say if other water boards will follow the approach of Delfland towards more privatisation. It seems they are keenly observing the outcomes of the negotiations and what follows in the case of Delfland.

4.4.2.4. Liberalisation: other sectors

In relation to the other public network services water supply and sanitation services are rather conservative towards liberalisation. While the electricity and the telecom sector are opening up only a couple of “entrepreneur” examples can be noticed in the water sector.

The liberalisation process of the energy sector contains three phases. Two of them are completed while one of them; a free market for users with a contact power less than 3* 80

ampere, will be implemented in 2004. The electricity network is regulated by TENNET, which is owned by the State. The gas sector can also be considered as more open towards liberalisation as the water sector, although they are behind in relation with the energy sector.

4.4.2.5. *Liberalisation: future?*

It is difficult to say how the water sector will develop in the future. According to the Revision of the Water Supply Act little space is available to develop towards a more liberalised sector. Thereby incumbent drinking water companies often do not have interests in changing the current situation. Different aspects will determine if the attitude of the sector will change towards privatisation like the economic situation, the investment needed and the experiences abroad. If the financial pressures on the water sector grows water boards or Municipalities may decide to out contract different tasks to private parties.

4.5. CONCLUSION

The conclusion of the analysis of the legislation and emerging falls apart in 3 elements:

1. The evolution of the history of legislation in the WSS sector.

From the introduction of drinking water in the Dutch society, 4 phases have been identified. After the introductory period of drinking water in the years 1850 to 1900 where in mainly the large Dutch cities a drinking water network became available, the next 50 years were dedicated on widening the drinking water networks to all. Some legislations were implemented during these periods to define quality requirements and to compensate negative effects of public water supply, however legislations mainly focussed at stimulating connection rates (for example through subsidies) and private parties were very much involved in the drinking water sector. In the period just before World War II, the first sewerage networks were implemented resulting in almost half of the Municipalities having a sewerage network by the year 1940.

After the Second World War a period of institutionalisation started. The national State contributed very much in the sector mainly through two national policy acts: the Groundwater act of 1954 that created a concession system for water supplier and very importantly the Drinking Water Supply Act of 1957 that institutionalised the drinking water companies.

In the last decades of the 20th century three parallel trends can be distinguished which we combine under the heading of ‘integration and harmonisation’. Firstly from the seventies sewage collection and wastewater treatment gained importance. The relation between waste and health became dominantly present in the discussion and efforts were made to control the surface water quality and the set up of a funding and permit system (Pollution of Surface Waters Act of 1969). Secondly in the eighties the development towards a more integrated approach to water management became apparent. The Environmental Management Act of 1993 formed an integrated environment act that replaced many former separated legislations. Nowadays the policy plans are being directed more at issues such as sustainability through a more integrated approach taking into account every possible use of water and involving all relevant stakeholders wherever possible. And thirdly another actor became involved, namely

the European Union. Directives such as the Urban Wastewater Directive, the Nitrate Directive and recently the Water Framework Directive were reflected in the Dutch national policies.

2. The analysis of the current situation of the WSS through the water cycle division approach

The analysis of the current situation of the Dutch WSS sector through the elements of the water cycle provides an insight in the segregation the Dutch policy makers made in resource access, water treatment, water distribution, sewerage and wastewater treatment. Many actors are involved and coordination of actions is important to avoid overlaps and maximise harmonisation. Although the general level of services and performance is high, the weakest link is identified as the part that is directly managed by the Municipalities: sewage collection.

3. The future trends in water planning and management

Several trends can be noticed that might be continued in the future, such as the scaling up of the actors, on all levels, the efforts to benchmark among each other to induce transparency and improve performance. For the issue of liberalisation it is difficult to say if it will develop in the future. Currently there are very few examples of liberalisation. Also the national government stated very clearly in the Revision of the Water Supply Act in 2000 that drinking water services could only be executed by public organisations. With regard to the emerging legislation this might target at a more national control of the tariffs. Currently this is still in the hands of the shareholders of the drinking water companies. Other emerging legislation might be targeted at the weakest link in the water cycle, the Municipalities that manage the sewerage collection. Especially in this area huge investments will be needed which might trigger the public sector to start involving private parties. The investments needed to be able to fulfil the requirements of the EU Urban Wastewater directive already triggered the first initiative in wastewater treatment Private Sector Participation in Delfland.

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5. CHAPTER 5: COUNTRY REPORT SWEDEN

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5.1. INTRODUCTION

Sweden is one of the world's richest countries in terms of availability of fresh water. The country covers an area of 455.000 km², which is approximately the same size as Spain or California. It inhabits more than 100.000 lakes and a yearly runoff of approximately 175.000 million m³. Due to the enormous water sources the percentage of the available water extracted for consumption is very small (smaller than 2%) compared with other European countries. Sweden is a mostly flat country, except from the mountains in the northwest, which reach heights of up to 2,000 meters. Sweden is located in the north of Europe between Norway and Finland. It is one of the world's northernmost countries, on about the same latitude as Alaska and North Siberia. In spite of its location, the climate is mild. For the capital Stockholm the average temperature is 18 degrees Celsius. Less than 10% is farmland and the majority is forested.

The distance from north to south is nearly 1,600 km and the maximum distance in an east-west direction is 500 km. Most of the Swedish people live in the southern part of the country or near Gothenburg and Stockholm. Below the statistics on population as divided over urban and rural areas is presented:

Figure 5-1 Map of Sweden⁶⁹



Table 5-1: Population Statistics Sweden⁷⁰

Year	Population		
	Total (millions)	Rural (%)	Urban (%)
1990	8,6	17% ('80)	83% ('80)
2000	9	17%	83%

Several characteristics of the Swedish Water Supply and Sanitation (WSS) sector are remarkable. One is the relatively big amount of water usage per inhabitant, which is around 180 litres per day. Compared to other European countries Sweden belongs to the highest water consumers. Another remarkable aspect is the relatively low price of water in Sweden. The water price in Stockholm is for example about 1.15 €/m³. which is considerably lower if compared to other European cities large differences appear (Madrid 0.94 €/m³, The Hague 1.85 €/m³ and Zurich 1.37 €/m³)⁷¹. The low Swedish water and wastewater charges are remarkable considering that Sweden has no scale advantages as the population is small in number and a huge part of the country is sparsely populated. The quality and service levels of the drinking WSS sector provided to their customers are generally high. This high level

⁶⁹ Source: VAV, Facts on WSS in Sweden

⁷⁰ Statistics Sweden: <http://www.scb.se/indexeng.asp>

⁷¹ OECD, Water: Performance and Challenges in OECD countries, p 27, 2003

combined with the low pricing resulted in an almost invisible water and sanitation sector for the clients. The discussions about the organisation of the sector and the possible involvement of the private sector made the sector more visible.

5.2. GENERAL FRAMEWORK FOR WATER MANAGEMENT

5.2.1. *Institutional Framework*

Since 1995, Sweden became a member of the European Union. In a recent referendum the Swedish voted against participation in the EURO. Sweden has a constitutional monarchy with a parliamentary form of government. The administration of Sweden has three levels. The legislative assembly in Sweden is the parliament (Riksdagen), which is elected every fourth year. Other central administrative bodies are the Government and the various Ministries. The main tasks related to water management are delegated to local or regional bodies. On the regional level there is the County Administration that has an examining, supervising and co-ordinating function. On the local level there are 289 municipalities, which are responsible for planning, construction and operation of the facilities for water and wastewater. The municipalities also own these facilities. The median size of a municipality is only 16,000 inhabitants. The largest, Stockholm, has more than 700,000 inhabitants and the smallest, Bjurholm, less than 3,000.

Over the past 50 years, responsibility for several major public services such as social care and elementary school has been shifted from the state to the municipalities. This change resulted in a decline in the number of local authorities from 2300 to 289⁷². Small communities were not able to provide the services efficiently, so decided to combine their administrations.

Traditionally the Swedish WSS sector is firmly in the hands of the municipal sector⁷³. All together some 6,000 staff are employed in the Swedish Drinking water and wastewater sector. Among these 2,000 are operational staff at the plants, 2,000 are occupied in maintenance, etc. of the networks and 2,000 in-door staff. Due to computerisation and economic efficiency

⁷² VAV, Facts on water supply and sanitation, 2000

⁷³ Gustafsson, Public Water Utilities and Privatisation in Sweden, 2001



claims the total number of staff has been reduced by some 4,000 during the 1990s. Drinking water-, environment- and health regulation are all supervised or directly controlled by the Municipal Committees for Environment and Health (MCEH). Although a new trend is to establish regional Public Limited Companies (PLCs), the local municipalities administrate still 85 % of the water supply and sewage disposal. The remaining 15% is partly or entirely privately managed, mostly through⁷⁴ PLCs that are operating more independently from the municipalities. Only 7 municipalities provide the services through management contracts with private parties. In comparison to other countries, it is interesting to see that the contract period for a Swedish management contract is short (4-7 year)⁷⁵. Table 5-2 presents a summary of Sweden's WSS characteristics:

Table 5-2: Summary of WSS characteristics ⁷⁶

		3 Swedish main cities			Sweden Total
		Stockholm	Gothenburg	Malmö	
# of WSS utilities	Managed by the municipality			1	244
	Inter municipal companies	1	1		40
	Management contracts				7
Population supplied (million inhabitants)		0.72	0.44	0.24	7.7
Drinking water production (Mm3)		77 / 31 ⁷⁷	44 / 3	26 / 0	937
Surface water / Groundwater / Artificial Groundwater (%)		100% / 0%	100% / 0%	79% / 21%	51% / 25% / 24%
Length of Water mains (km)		1 744	1 714	851	66 120
Length of sewers and storm water pipes (km)		1 569	1 560	899	87 450
Number of wastewater treatment plants					2 078

The strong involvement of municipalities in the WSS sector is reflected in the fact that some small municipalities are subsidising the tariff, although in total 99% of the costs of the WSS

⁷⁴ IWA. Country report Sweden, 2000

⁷⁵ VAV, Facts on water supply and sanitation in Sweden, p5, 2000

⁷⁶ Helland and Adamsson, Performance Indicators: benchmarking between six cities in Scandinavia, J Water SRT – Aqua Vol. 47, No. 6, pp. 284-288, 1998

⁷⁷ Sales within the City / supply to other municipalities

sector are covered by the tariffs charged to the customers. Investment in production plants and the network amount to each year to about 2,5 to 3 billion SEK (€ 0.3 billion).⁷⁸ Total cost for water supply and sewage disposal services was in 1999 estimated to 14.1 billion SEK (€ 1.5 billion), including 15% Value Added Taxes (VAT). The level of cost recovery is varying over each of the municipalities. While larger municipalities generally approach cost recovery levels, the small communities are mostly not able to work on full cost-recovery basis. Since 1994 the drinking water companies have to pay VAT on their turnover. Without these VAT, the average company would be able to operate on a cost-recovery basis.

5.2.2. Resource status and Resource Use

Sweden is rich in water. Apart from the southeastern part of Sweden and the largest islands Gotland and Öland and the archipelago islands, water supply constitutes no major problems due to the abundance of available resources.

Table 5-3: Statistics Water Resources⁷⁹

Year	Total renewable freshwater resources (billion cu.m.)	Withdrawal as % of total resources	% of withdrawal used for		
			Agriculture	Industry	Domestic
2000	178	1,4%	9%	17%	73%

Its dense network of rivers, lakes and wetland makes Sweden rich in water resources from both ecological and economic points of view. The quality of most inland waters is suitable for most purposes.⁸⁰ According to the OECD, however, still Sweden's water resources face some problems, as:

- the mercury levels in pike still exceed international health standards in more than 40% of Sweden's lakes.
- National emission objectives for cadmium remain to be met.

⁷⁸ 1 € equals approximately 9,50 SEK

⁷⁹ World Development Indicators, 2002, World Bank

⁸⁰ OECD, Environmental Performance Reviews, Sweden country report, 2003

- Elevated concentrations of toxic substances from industry, agriculture, contaminated sediments and mine tailings are still found in fish, birds and mammals.
- Acidification, mainly from trans-frontier air pollution remains a concern.
- Nitrogen leaching from agricultural land has not yet been reduced sufficiently.
- The appropriate use and disposal of sewage sludge poses problems.

Salt intrusion is a problem in cities in the coastal zones. Water scarcity in the future may be a negative effect of the current groundwater discharge if no measures will be taken. Problems also occur because of the infiltration of salt used for a safe road during rainy days with a temperature around zero degrees celcius. The rising chloride levels in the groundwater cause corrosion of pipelines. Other problems are the nitrates levels and the pesticides.

The Environmental Code provides regulation regarding the water resources. Land and water areas that are particularly vulnerable from an ecological point of view need to be protected against measures that damage the natural environment and that may be prejudicial to their extraction⁸¹. There is generally no shortage of fresh water in Sweden. The paper and pulp industry are using the largest amounts of fresh water. Eutrophication of Sweden's water has been a geographically widespread problem for a long time, affecting lakes, watercourses, groundwater, and coastal and marine areas.⁸² Half of the water abstraction by drinking water companies comes from surface water, one fourth is ground water and one fourth is acquired through artificial infiltration.

5.2.3. General description of the history of water laws

The three most important laws regulating the WSS sector currently are:

⁸¹ The Environmental Code, chapter 3 sections 3 and 7.

⁸² Round table discussion paper water supply and sanitation in the Nordic and Baltic and Barents Sea regions

1. The Water Supply and Sewerage law⁸³ from 1970, that states that it is the municipality responsibility to arrange sufficient water supply and sewage treatment services to assure municipal population good health.
2. The Environmental Code from 1999, that regulates environmental standards and stipulates measures to be taken to prevent and minimise impacts on the environment caused by water abstractions and sewage effluents.
3. The Food Act from 1971, that states that drinking water is to be considered foodstuff and that it must be handled with equal standards as other food production.

Of these three, especially the Water Supply and Sewerage law is the most central piece of legislation in the evolving of Swedish regulation in perspective of liberalisation issues. Paragraph 1 of this law stipulates that municipalities have the responsibility to either themselves arrange or to make sure that someone else arranges adequate “public” (allmän vanlagnings) water supply and wastewater treatment to secure the health of their urban population. This law provides the foundation on which responsibilities in the water and sanitation sector are still founded. The law states specifically that municipal water supply and sewerage works are separate accounting administrations, which are not allowed according to the law to be operated by a profit margin, only to be funded by connection fees and operation charges. The law articulates that water charges are not to exceed necessary costs to provide the services and that water charges can only be used within the water sector. It is thus illegal for any owner of ‘for the public necessary’ water and sewage facilities to ‘profit’ from these services. Consequently, municipalities cannot gain money to be used in other sectors and private companies cannot expect to pay profit-based dividends to their shareholders.⁸⁴ In this respect implies that private ownership is legally allowed but profit making is not. Profits must be used for, and presented in investment plans for coming years.

Under paragraph 2 it is stated that a municipal water supply and sewerage works is a societal concern. The municipality has the responsibility for health protection (prevention and

⁸³ Also referred to as ‘The Public Water and Wastewater Plant Act’ in literature

⁸⁴ Lannerstad, Country Report Sweden, Aqualibrium project, not published.

control), and therefore also should provide the water and sanitation services.⁸⁵ If somebody else than the municipality operates water and sanitation services, the new operator has first to be declared “public” by the County Administrative Board. The actor, public or private, with direct responsibility for the operations is considered the “Principal” (huvudman). Occurring disputes between Principals and connected property owners are handled on a national basis by the Swedish National Water Supply and Sewage Tribunal (Statens VA-nämnd) according to article 36 of the Water Supply and Sewerage Act.

Table 5-4: History of Swedish Legislation

1918 Water Act Number 523
1956 Price and Regulation Act (1989: 978)
1969 Environment Protection Act
1970 Water Supply and Sewerage Law (1970: 244 Lag om allmänna vatten- och avloppsanläggningar)
1971 Food Act (Livsmedelslagen, SFS 1971: 511)
1978 Certain Pipeline Act (1978:160) (reformed in the Environmental Code)
1989: Directions from the National Food Administration concerning Drinking Water (Statens livsmedelsverks föreskrifter om dricksvatten, SLFVFS 1989: 30)
1991 Local Government Act (1991:900)
1993 Drinking water Act (Ordinance)
1993 Swedish competition Act (1993:20)
1998 Municipality Act (Kommunallagen, SFS 1998:1)
1999 Environmental Code (Miljöbalk 1998:808)
2001 Dricksvattenkungörelsen, SLVFS 2001: 30
2002: Utredningen om oversyn av va-lagstiftning, Miljödepartementet, Direktiv nr: 2002: 46, M 2002: 02

In the evolution of Swedish legislation in the WSS sector the following phases can be defined:

Phase 1, the period until 1930: The introduction of the public water supply and wastewater services

⁸⁵ Gustafsson, Public Water Utilities and Privatisation in Sweden, 2001

Phase 2: from 1950 – 1990: The forefront of environmental issues

Phase 3: from 1990 – now: The debate on privatisation

*5.2.3.1. Phase 1: The introduction of the public water supply and wastewater services (the period until 1930)*⁸⁶

This period can be characterised from the rationale that drinking water and wastewater provision will improve the public health conditions. Already in the mid 16th Century king Gustav Wasa stated that all property owners must keep a barrel containing 200 litres of water close to the street.⁸⁷ House owners had to clean the area outside their own houses and the order in which the street was cleaned was important. When the mayor decided, due to odour, the upstream barrel was emptied in the gutter followed by the others in due order, thus exporting the problem to the receiving waters. More extensive measures were taken in 1661. One new idea introduced at that time was that waste should be taken care of by house-owners, assembled and transported to special waste-barged moored at certain places. During the first half of the 19th century conditions degenerated completely.

In 1861 Stockholm's first waterworks were established and work began on a water supply network. The main reason for water supply networks in the cities was up to the late 19th century, its use for combating fire. After a couple of outbreaks of cholera in Stockholm and Gothenburg, drinking water was also recognised as being important for the public health conditions. Subsequently urban water supply works were constructed at the end of the 19th century (Gustafsson, 2001). As the town grew, particular problems were posed by the emptying of the latrines, do the necessity came to plan a sewerage system. A first plan was put forward in 1866. It was until 1895 that all built-up streets in Stockholm had sewers. In the beginning of the 20th century when toilets were introduced, the first wastewater treatment plant was installed. One of the reasons for introducing wastewater treatment facilities was peculiar. In the late 1930s downtown Stockholm needed to cancel an important swimming tournament because of the bad quality of surface water in the city. The swimming event was held elsewhere. The municipality of Stockholm decided that this was unacceptable and began

⁸⁶ VAV, Bases on the facts on water supply and sanitation in Sweden, 2000, p 7-12

⁸⁷ Water Management in Stockholm, a report on water management in the Stockholm Municipality, 1982



planning to treat the wastewater discharged into the urban surface water. The early installed sewerage systems are mixed. They transport the storm water as well as the urban wastewater. Under the 1918 Water Act the authorities could forbid the discharge of materials that might harm the condition of functioning of the sewerage system. The Water Act regulates the abstraction of water from surface as well as groundwater sources and also indicates how the water is to be distributed in a just and fair way between competing interests. The Act also sets rules for the protection of water sources against pollution and there are regulations that relate to construction projects for the water industry.⁸⁸.

5.2.3.2. Phase 2: The forefront of environmental issues 1950 – 1990

From the early fifties Sweden embarked on a new phase in the WSS sector. While before the emphasis was put on improving public health conditions, now the attention was driven towards reducing the damaging effects on the environment. In the short period from 1965 to 1975 most of the 285 municipalities in Sweden were provided with wastewater treatment plants up to the highest international standards⁸⁹. The national government stimulated this development by subsidies up to 50% of the construction costs⁹⁰. The effort resulted in a connection rate of more than 50% in 1975. First priority had been given to the oxygen demand. During the seventies the organic matter discharged after the treatment services decreased from almost 80.00 to 20.000 tonnes a year. Secondly the phosphorus discharge has been reduced during the seventies from almost 8 tonnes a year to less than 1 tonnes yearly⁹¹. After decreasing of the oxygen demand and the phosphorus discharge of the treated wastewater, the removal of nitrate became an important issue in 1990.

When the Environment Protection Act came into force on 1 July 1969 authorities were given more chance to force industries to adopt measures to obstruct pollution from the discharge of wastewater.⁹² At first, priority was given to environmental protection measures for the surface finishing industry. During the early 1970s 25-50% of the cost of industrial purification plants

⁸⁸ EUREAU, Management Systems of Drinking Water Production and Distribution Services in the EU member states in 1996.

⁸⁹ Gustafsson, Public Water Utilities and Privatisation in Sweden, 2001

⁹⁰ Gustasson, Public Water Utilities and Privatisation in Sweden, department of Land and Water Resources Engineering, KTH, Sweden, p1

⁹¹ VAV, Bases on the facts on water supply and sanitation in Sweden, 2000, p13

⁹² Water Management in Stockholm, A report on water management in the Stockholm municipality, 1982

was subsidized by the state and this stimulated industry to take actions against, for example, water pollutants. The provisions of the Environment Protection Act have gradually been applied to more companies and branches. Under the Environment Protection Act the County Council is made responsible to supervise those industrial activities that affect the environment, i.e. discharge into air and water, and noise and waste.

Alongside the Environment Protection Act, the Municipality also has the 1970 Water Supply and Sanitation Law and local Municipality regulations by which to regulate the rights of property owners to use the sewerage system. For example all petrol stations in Stockholm are required to see that oil and petrol are separated in accordance with the guidelines set by the Environment Protection Board. Furthermore the municipalities impose special industrial water rates so that industries discharging greater concentrations than normal households have to pay extra fees.

Another Act that emphasises the increased importance given to water during this period was the Food Act from 1971. This Food Act states that drinking water is to be considered foodstuff and that it must be handled with equal standards as other food production.

The water consumption was at its highest level at the end of 1960, when 800 million cubic meters were used annually. The leakage in the pipe system is estimated to increase this figure by 20%. Till 1970 the amount of drinking water consumed in the cities had increased. After 1970 the amount of water used decreased a little or has remained at the same level. Today the consumption is some 730 million cubic meters, which at household level expresses a 200 litre per person per day. In the 1970's and the 1980's, environmental issues were at the forefront of Sweden's agenda.⁹³

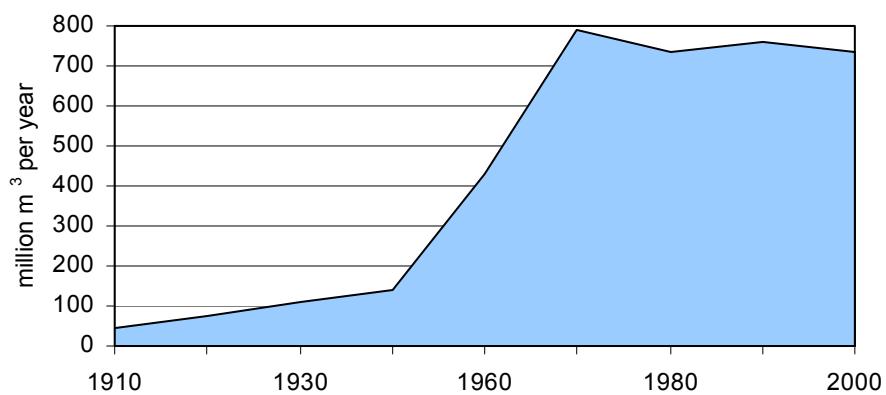
Although the main point on environmental attention was in the 1970s, also later on legislation was drafted and modified. As Sweden's EU accession in 1995 has heavily influenced the country's environmental policy. Already in January 1994, when the European Economic Area Treaty came into force, most EU acquis in the area of environmental legislation was adopted. In 1995, when Sweden joined, the entire EU acquis became applicable although a transition

⁹³ OECD, Conclusions and recommendations approved by the group on Environmental Performance at the 1996 meeting.



period was allowed under which the EU legislation would be subject to renewal. It has enabled Sweden to conduct its regional and global environmental work with new vigour. Since 1995, all EU legislation has been incorporated into Swedish law and ordinances. Since accession, Sweden is one of the countries in the EU that has the best record of transposing EU legislation into national law.

Figure 5-2: Water usage in Sweden during the 20th century⁹⁴



A major recent legislative event was the drafting of the Environmental Code. This Code that was adopted, after a decade of extensive work, in 1998 by the Swedish parliament⁹⁵ was to apply from January 1999. The Environmental Code comprised coordinated, stringent and wide ranging environmental legislation aimed at promoting sustainable development. The provisions previously contained in a total of 15 environmental statutes were collated in the Code. The Code contains also new elements such as the ‘overall objectives’ and ‘general rules of consideration’. The provision of the Environmental Code are aimed at promoting sustainable development so that present and future generations will be guaranteed a healthy and good environment.

The environmental focus in policy formulation and implementation resulted in positive effects on the WSS sector. The quality of the treated wastewater increased and municipalities were establishing plans for the protection of the groundwater supply areas. Besides the

⁹⁴ Source: Aequilibrium, European Water Management between Regulation and Competition,

Country report Sweden

⁹⁵ OECD, Sweden’s national and international environmental policy, 2003



improvement of the quality of the treated wastewater the connection rate has also increased the last decade. In the year of 1994 only 87% of the citizens were connected⁹⁶. Nowadays 95% of the wastewater is treated.

5.2.3.3. Phase 3: Debate on privatisation 1990- now

The last phase identified in the development of Sweden's water policy aimed at gaining efficiency improvements and overcoming the lack of financial resources at the municipal level. Until the 1990s private sector involvement in the Swedish water sector was not regarded as a viable option due to experiences elsewhere in Europe with multiple market failures associated with water and sanitation and the strong Swedish belief in the welfare state. The debate on private sector involvement started at the local municipal level in the beginning of the 1990s. The main reason for the introduction of the debate on private sector involvement was the need for efficiency improvements in the water and wastewater sector due to the lack of financial resources at many municipalities (Mattson, 2000). Until 1993 the most dominant piece of legislation with regard to possible private sector involvement was the 'Price and Regulation Act' from 1956 (1956:978). This Act stated that the Government, or the public authority appointed by the government, has the ability to prescribe a specified reasonable price as a maximum with respect to the sale of specific goods or the performance of a specific services, such as water and sanitation services. Frozen prices for services may not be exceeded without authorisation (section 13 and 14). The Government is even able to reduce the frozen prices to a reasonable level if it judges it justified (section 17).

The main piece of legislation resulting from the debate on privatisation was the Swedish Competition Act in 1993 (1993:20). The purpose of this Act was to eliminate obstacles to effective competition in the field of production of and trade in goods, services and other products (Article 1). Exemptions related to agreements, which influence competition negatively are worth mentioning. An agreement may be allowed despite a negative effect to competition, if; (i) it contributes to the promoting of technical or economic progress, or if it (ii) allows consumers a fair share of the resulting benefit.

⁹⁶ OECD, Water: Performance and Challenges in OECD countries, p 21



To further support commercialisation the Swedish Local Government Law was re-edited in 1991 in neo-liberal direction, give the municipalities greater freedom to organise infrastructure services. Public Companies like the Stockholm Water Company AB, were supposed to imitate private company behaviour and then learn from each other.

The discussion about private sector involvement changed from a more fundamental discussion towards a more practical one when experiences with privatisation became known. Different EU-directives and a complex and demanding environmental legislation put pressure for time and proficiency in small municipal WSS units. Local debates around privatisation of WSS services have occurred in those smaller municipalities where change of operation has been implemented.

One of the first cases occurred in Vaxholm municipality northeast of Stockholm. This town, run by a local conservative government, put its technical infrastructure services for tender in 1987⁹⁷. The first major proposed private involvement was in Malmö municipality in 1994. The municipal water and wastewater works were subjected to one of the largest operation and maintenance tenders ever in Sweden. As many as 19 private companies participated in the bidding process. The English trans-national company Anglian Waters through its subsidiary Nordvatten AB was chosen for contract negotiations. But during this period local elections were held, and the social democrats that opposed the private sector involvement won the election. Soon after the elections they cancelled the tender process. The resigning councillor Ollen meant that this was a devastating act for the credibility of future contract-by-tender-agreements. Nevertheless, during the 1990s some private sector arrangements were closed. For instance the Danderyd municipality contracted PEAB in 1995 for the water supply and wastewater works. Härnösand, a municipality in the middle of Sweden, contracted the operation of the water and wastewater services in combination with its roads to SKANSKA-Norrland.⁹⁸ In 1998, Karlskoga sold 49% of its shares of the municipal owned company to the

⁹⁷ The Vaxholm project was evaluated five years later and it was acknowledged that most municipal works/companies produced cheaper services than the private ones. As a consequence, the Vaxholm water and sewage service was transferred to Roslagsvatten AB, which is a Public Company operated jointly by several municipalities.

⁹⁸ In the new tender in 1998 the water supply and waste water works were separated from the road service, and won by NCC.

Finnish Fortum/IVO group, and set up Karlskoga Energy & Environment AB, which is a multi-utility company. The Finnish state controls Fortum by owning 70% of the shares.

A remarkable development took place in Norrköping, the 8th largest municipality of Sweden in number of population. In 1997 the Norrköping municipal water supply and sewerage works was corporatised and merged with the energy utility in Norrköping Environment & Energy Company (NME AB). The energy company Sydkraft bought 49% of the company's shares. Sydkraft is one of the three biggest energy companies in Sweden and is controlled for 67% by the German based multi utility giant Eon. In 2000 Sydkraft acquired all shares in the NME AB and paid 2,795 million SEK (€ 292 million).

Another example of (foreign) private sector involvement took place in Norrtälje, located to the north of Stockholm, the municipality board contracted in 2001 Vivendi for operation and maintenance of 143 water works, 3 water towers, 6 water supply pumping stations, 19 sewage treatment works, 73 sewerage pumping stations, 310 km water supply network, 230 km sewers and 150 km surface drainage network. The total contract value was estimated at 300 million SEK (€ 33 million) for a period of 10 years.

5.2.4. Main public and private actors involved in the Swedish Water and Wastewater sector

5.2.4.1. Ministry of the Environment (Miljödepartementet)

This ministry is responsible for the protection of the Swedish water and the investments in waterworks of general interest. Executing bodies at different levels supervise the water quality. On the national level the Swedish Environmental Protection Agency (Naturvårdsverket) supervises the sector. Supervision at the regional level is done by the County Administrative Board (Lanstryrelsen) and at the local level by the MCEHs (Miljö- och Hälsoskyddsnämnden).

5.2.4.2. *Ministry of Agriculture, Food and Fisheries (Jordbruksdepartementet)*

This ministry has the overall responsibility for drinking water quality, as drinking water is regarded as a food stuff according to the Food Act.

5.2.4.3. *National Food Administration (Livsmedelsverket)*

The central supervising body for drinking water quality is the National Food Administration. The National food administration receives and reviews the annual quality reports of the drinking water companies. They execute the proficiency testing programs two times a year.

5.2.4.4. *Swedish Environmental Protection Agency (Naturvårdsverket)*

The Swedish Environmental Protection Agency is the central supervisory body for water protection in Sweden. This agency has been given the task to promote and co-ordinate an ecological development and to act as a dynamo for change, both in national and international work⁹⁹.

5.2.4.5. *County Administrative Board (Länstyrelsen)*

The County Administrative Board bears overall responsibility for implementing and evaluating the environmental resources at regional level, including the supervision of water protection. The County Administrative Boards support the municipalities by providing data to enable them to formulate local objectives and action programmes. If the environmental impact is limited, the County Administrative Board is the authority that is authorised to provide permits.

⁹⁹ Analysis of the legislation regarding renewable energy sources in the EU member states, report concerning planning in Sweden, 2001 <http://www.jrc.es/cfapp/eneriure/Reports/SWE%20pla.pdf>

5.2.4.6. Public Limited Companies (PLCs) for Water and Wastewater provision

Since the 1970s a limited number of Swedish municipal water and wastewater works have been corporatised like the Stockholm Water Company AN, Roslagsvatten AB, i.e. transferred into a full (100%) municipal water and sewerage company under public ownership. Today 38 municipalities organise their ownership of water and sewage services in this form. The public through the politicians that normally form the board of directors indirectly controls PLCs with public ownership.

5.2.4.7. Municipal Committees for Environment and Health (MCEH, Miljö- och hälsoskyddsnämnden)

The MCEHs are responsible for supervision of water protection and drinking water quality at local level. The MCEHs control the drinking water-, environment- and health regulations.

5.2.4.8. Municipalities

According to the law the municipalities have the overall responsibility for the provision of public water supply and sewage disposal services. The Principle of Public Access to Official Records (offentlighetsprincipen) guarantees every citizen full access to all documents in the municipal administration and thus everything that concerns the municipal water supply and sewage works. If the Principal is a Limited Company formal public transparency is restricted to annual reports and annual financial reports. In case of private ownership (only in Norrköping) the municipality can appoint a so called “Supervisor” (Tillsynsman) to inspect operation and accounts to assure the citizens, according to the Water and Wastewater Law, good quality water at prime cost. The Supervisor must be granted full access to all parts of the facilities as well as to all accounts. The Supervisor reports to the municipality.

5.2.4.9. Swedish water and Waste water Association (Svenskt Vatten AB)

The Swedish water and wastewater Association was set up by the municipalities in 1962 and supports the municipal WSS provision. All 289 municipalities are members of Svenskt Vatten AB. It supports the municipalities with information on technical administrative and economic issues. A main task is also to market the water sector in the public debate and thus to strengthen and give the member s a more influential role in the development of society.

Svenskt Vatten AB is a member of the European Union of National Association of Water Supplies (EUREAU) and administers the national secretariat for the International Water Association (IWA)

*5.2.4.10. Swedish National Supply and Sewerage Tribunal (*Statens VA-nämnd*)*

This tribunal deals with problems between the provider and the customer of the water services, according to article 36 of the Water Supply and Sewerage Act.

Appeals against decisions are dealt with in the Superior Water rights Court. The final court of appeal is the High Court of Justice.

5.2.4.11. The Water Rights Court

The authority that is responsible for the issuing of licences for the abstraction of water is the Water Rights Court.

*5.2.4.12. Regional Environmental Courts (*Regionala Miljödomstolarna*).*

Permits for discharges of treated wastewater to the recipient for the majority of sewage treatment plants are issued by the Regional Environmental Courts.

5.2.4.13. National Licensing Board

The licensing authority provides the withdrawal permits for major treatment plants.

5.2.4.14. Swedish Competition Authority

The Swedish competition authority controls if agreements not “eliminate and counteract obstacles to effective competition in the field of production of and trade goods, services and other products”¹⁰⁰.

¹⁰⁰ Swedish Competition Act amended 2002:595, article 1

5.2.4.15. Swedish Water Development (SWD) AB

The Swedish Water and Waste Water Association (VAV), the Stockholm Water Company and the Water and Sewage Works in Gothenburg and Malmö established in 1996 the SWD AB to assist municipal and state-owned organisations outside Sweden by communicating Swedish knowledge and experience about ownership, operations and management of water and wastewater facilities. The Company is based on the Swedish model of public ownership and control. SWD's board is composed of municipal politicians and civil servants. SWD projects are financed through funds and grants from the Swedish government and or the participating municipalities. According to the Water Supply and Sewerage Law, the SWD is not allowed to raise funds from the tariff system.

5.2.4.16. Swedish Municipal Workers Union

Since around 1995 also the labour unions got involved in the discussion around possible private sector involvement in the water sector. They carefully monitor the developments and are hesitant in view of possible lay offs, and are referring to similar cases happened across Europe. The president of the union last year underlined her position by stating that water is not a commercial good.

5.2.4.17. Private parties

Although only few, some private parties are involved in the provision of WSS. All of them are Swedish, with the exception of one: Vivendi.

Figure 5-3: Organisation of Water Actors in Sweden

This figure is based on the description of the main actors in Swedish Water Sector in the previous chapter.

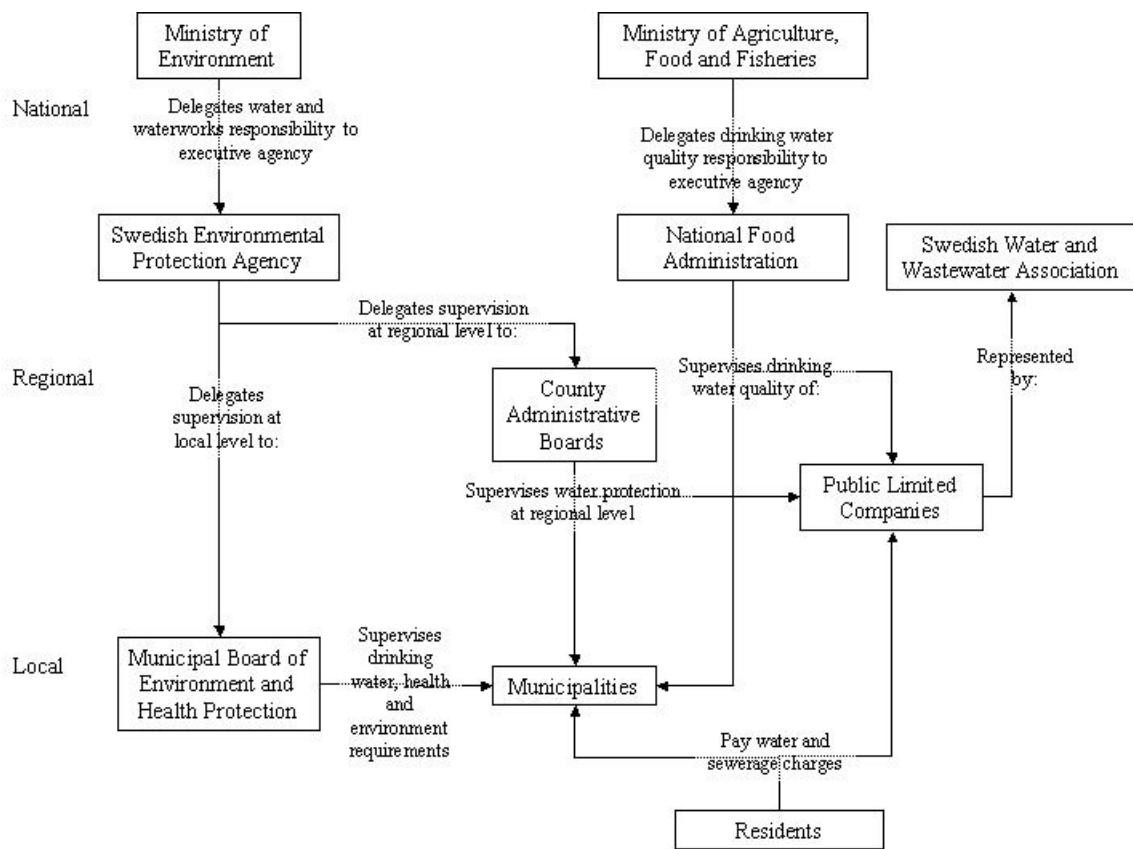




Table 5-5: Phases in the development of the policy design concerning water policy in Sweden

Phases	Policy Design	Actors of implementation
The period up to 1930: Introduction of the public water supply and wastewater services	<u>Objectives:</u> introduction of water and wastewater services <u>Causal hypothesis:</u> Drinking water and wastewater provision will improve the public health conditions. <u>Instruments:</u> legislation such as the 1918 Water Act, and municipal investments. Prohibition of harmful discharges. Regulation of abstractions. <u>Target Groups:</u> urban citizens, municipalities.	National Government Municipalities (mainly the larger ones)
From 1950 – 1990: The forefront of environmental issues	<u>Objectives:</u> To promote sustainable development that will assure a healthy and sound environment for present and future generations. <u>Causal hypothesis:</u> Improvements in drinking water and sanitations operations and infrastructure will lead to less damaging effects on the environment. <u>Instruments:</u> Subsidies from the national government of the construction of wastewater treatment plants. Regulations on rights of property owners to use the sewerage system. Special industrial water rates with higher fees for discharges of higher concentration. Reporting requirements. Legislation such as the Environmental Act from 1969, the Water Supply and Sanitation Law from 1970, and the Food Act from 1971. <u>Target Groups:</u> The County Council, the municipalities, the PLCs, industries	Ministry of Environment Swedish National Supply and Sewerage Tribunal National Food Administration The Water Rights Court National Licensing Board The Environmental Protection Board Regional Environmental Courts The County Administration Council Limited Public Companies The municipalities
From 1990 – now: The debate on privatisation	<u>Objectives:</u> Gaining efficiency improvements and overcoming the lack of financial resources at municipal level <u>Causal hypothesis:</u> involvement of the private sector leads to decreased pressure on municipal budgets and increased efficiency in the company's operations. <u>Instruments:</u> Possibility for governments to influence prices. Legislation such as the Swedish Competition Act of 1993 and the re-editing of the Local Government Law in 1991. <u>Target Groups:</u> Municipalities, the PLCs and the private sector.	Ministry of Agriculture, Food and Fisheries Swedish Competition Authority Swedish Water and Wastewater Association Municipalities PLCs Private Parties Swedish Municipal Workers Union

5.3. SYNCHRONIC ANALYSIS OF THE LEGISLATION

5.3.1. Resource access

5.3.1.1. Property rights on the water resource

Every landowner has the right of disposition to the groundwater under the surface.

5.3.1.2. Public Policy on the Resource

Objective

One of the general environmental objectives is to realise within a generation that the use of energy, water and other natural resources is efficient, resource saving and environmentally sound and that the preferred energy sources are renewable¹⁰¹. In other words the objective is to manage natural resources so as to ensure their sustainable use¹⁰².

By 2010 all water sources that are used to supply more than 50 persons or that supply more than 10 m³ per day on average with drinking water will need to meet the Swedish standards for good-quality drinking water in terms of anthropogenic pollution¹⁰³. In the year of 2015 a “good groundwater status” should be established according to the WFD, or as the Swedish put it “the consumption or other human impacts do not lower the groundwater level so as to jeopardize the supply and the quality of the water “.¹⁰⁴

Private wells have usually no purification for drinking water. There are no targets to increase this percentage since there is no need. Nearly 100% of the drinking water from the urban municipality water plants is more or less treated.¹⁰⁵

¹⁰¹ Swedish Environmental objectives council “ Swedish Environmental Objectives, will the interim targets be achieved, 2003, p 58

¹⁰² OECD, Conclusions and Recommendations approved by the group on Environmental Performance at its May 1996 meeting, 1996, p1

¹⁰³ Swedish Environmental objectives council “ Swedish Environmental Objectives, will the interim targets be achieved, 2003

¹⁰⁴ Swedish Environmental objectives council “ Swedish Environmental Objectives, will the interim targets be achieved, 2003, p 33

¹⁰⁵ Round table discussion paper water supply and sanitation in the Nordic and Baltic and Barents sea regions

Instruments

Sweden has no specific pricing policy for water abstraction. Besides a permit, which is needed to discharge ground or surface water, a discharge tax does not exist in Sweden.¹⁰⁶

There are no specific policies for the efficient allocation of water to promote economical development, but permits according to the Water Act and local agreements by water associations can have that effect. There is a Comprehensive Plan for Integrated Land and Water Management at the municipality level. It is not legally binding, but gives guidelines for implementation of sector-oriented legislation. Municipalities have to investigate the water needs in the year of 2005.¹⁰⁷ Another prescriptive instrument is the municipality's obligation to provide a water supply plan in the year of 2009. These plans, including water protection areas and protective provisions, will be adapted for all large surface water sources, i.e. water sources that are used to supply more than 50 people or an average of 10 m³ on a daily basis. On a higher political level water supply plans will be made. The municipalities and county administrative council bodies should adopt local and regional water supply plans¹⁰⁸.

Next, Sweden is currently implementing an extensive action program aimed at reducing nutrient-rich effluents into freshwater bodies and the sea, with a view to halve the land-based sources of marine pollution, particularly of hazardous substances.¹⁰⁹

Actors of implementation

The Ministry of the Environment is responsible for the protection of the Swedish water and the investment in waterworks of general interest. Its' executing agencies, being at national level the Swedish Environmental Protection Agency, at regional level the Country Administration Boards and at local level the MCEHs are responsible for implementing the policy objectives. Next, the Water Rights Court, the Regional Environmental Courts and the

¹⁰⁶ OECD, Sweden, conclusions and Recommendations approved by the group on Environmental Performance at its May 1996 meeting

¹⁰⁷ Swedish Environmental Protection Agency, "Swedish Environmental Objectives, monitoring the interim targets", 2003, p 37

¹⁰⁸ Swedish Environmental Protection Agency, "Swedish Environmental Objectives, monitoring the interim targets", 2003, p 34

¹⁰⁹ Round table discussion paper water supply and sanitation in the Nordic and Baltic and Barents Sea Regions

National Licensing Board are acting as actors of implementation with respect to the issuing of permits.

Target group

The municipalities and County Administrative Councils are targeted to provide the water supply plan, including the water needs and the protection areas. All landowners, the municipalities and the PLCs are targeted since they need a permit for abstraction.

Rationale

An established permit system and integrated structured planning efforts will lead to better use of the water resources.

Outcomes

The levels of anthropogenic pollution in groundwater are so low that its quality meets the requirements for good drinking water quality in accordance with Swedish standards for drinking water and good groundwater status under the Water Framework Directive (WFD)¹¹⁰. A majority of the introduced legislation addresses activities to be undertaken for the future (such as the drafting of the water plans), so at this moment it is still too early to evaluate the outcome of the legislative measures.

5.3.2. Production

Legislation in force

1970: Water and Wastewater Law

1971: Food Act (1971:511)

1989: Directions from the National Food Administration concerning Drinking Water (Statens livsmedelsverks föreskrifter om dricksvatten, SLFVFS 1989: 30)

1991: Local Government Act (1991:900) has been revised

¹¹⁰ Swedish Environmental Protection Agency, “Swedish Environmental Objectives, will the interim targets be achieved”, 2003, p 32

Objective

The Food Act defines drinking water as food, which implies that the Directions from the National Food Administration concerning Drinking Water apply the management and control. The overall goal stated in the Directions is “to ensure the consumers a drinking water of good quality”. The same standards as for other food production are applied to water works.

Instruments

Different instruments are introduced and most of them are prescriptive. The Food Ordinance describes the drinking water quality standards. The entity, which provides drinking water, is obliged to perform according these quality standards. Also the Directions from the National Food Administration demand the operator to suggest a self-control program regulating the frequency and type quality control, which is decided by the MCEH. The Local Government Act from 1991 states that municipalities are responsible for water supply and sewerage, rescue services and refuse disposal. Moreover municipalities and councils may levy charges for the services they provide and they may not levy charges exceeding the cost of the service provided by the municipality or county council (prime cost)”

Actors of Implementation

The Ministry of Agriculture, Food and Fisheries has the overall responsibility for drinking water quality. Its executive agencies the National Food Administration and at local level the MCEH are implementing the policy of the Ministry.

Target group

The target groups of the regulation are mainly the more than 2,000 municipal water supply works¹¹¹ that operate the water supply services.

Rationale

¹¹¹ Gustafsson, Public Water Utilities and Privatisation in Sweden, 2001

Setting of national and international standards for the quality of the drinking water will motivate municipalities and other institutions that provide drinking water to improve the quality of service provision.

Outcomes

From the municipal water works yearly output of 940 million m³, 540 m³ are directed towards household use, supplying 7,6 million inhabitants (85%) with freshwater. The Swedish drinking water is good tasting and have high quality (Eriksson, 2000).

5.3.3. Distribution

Legislation in force

1970: Water and Wastewater Law

1971: Food Act (1971:511)

1989: Directions from the National Food Administration concerning Drinking Water (Statens livsmedelsverks föreskrifter om dricksvatten, SLFVFS 1989: 30)

1991: Local Government Act (1991:900) has been revised

Objective

Unlike other European countries, Sweden has not executed a water saving policy. One of the reasons for not executing a water saving policy is the water quality problem that may occur when the residence time of the drinking water in the distribution network increases ¹¹². A decrease of the residence time of the drinking water in the distribution network is the prime objective for the Swedish government. Another objective of Swedish legislation with regard to the relation with the client is the prevention of improper use of the collected water charges.

Instruments

The instruments used to achieve the quality objectives are prescriptive. The Drinking Water Ordinance describes the obligated quality standards at the level of the end user. Besides this prescriptive instrument the publication of the results, such as quality parameters and tariffs,

¹¹² VAV, Facts on Water Supply and Sanitation in Sweden, 200, p 10



stimulates the drinking water operators and the responsible MCEH protection to improve their drinking water services. The Food Act provides the MCEH the possibility to issue appropriate injunctions and/or prohibition of use if they find the quality of drinking water unfit to be consumed. In case the MCEH and the Principal are in disagreement over what measures to be taken, the MCEH has the right to decide. Offence against the Food Act can render a fine or a sentence of imprisonment for up to one year.

Box 5-1: Prescriptive measure from the Stockholm City Court

The plastic pipe companies KWH and WAVIN from the Netherlands, were ordered by the Stockholm City Court to pay fines totalling SEK 10.6 million (€ 1.2 million) for illegal co-operation in a cartel. During the period 1993-1995 the companies were found guilty of market sharing, co-operation over prices and collaborating over large municipal procurement of water pipes.¹¹³

In relation to the tariffs, the Water Supply and Waste Water Law describes the exclusion of improper use of the revenues. The law regulates that water supply and wastewater tariffs may not be used for other sectors. The administration of the water and wastewater services should be separated from other municipal budgets. The Swedish consumers pay a connection fee and an operation charge per m³ consumed. The connection fee is an initial outlay at the time of the investment in new residential, commercial and industrial areas. The fee might be calculated per connection point to the network, per plot area or per apartment area. It varies due to geographical and market factors (climate geology, location, regional economy etc) among the municipalities. To facilitate a fair fee, practically all consumers have water meters. The total number of water meters is 1,5 million. In addition to the connection fee the Water Supply and Sewerage Law from 1970 allows for using the total water and wastewater charge to cover costs for investments.

Actors of implementation

The Ministry of Agriculture, Food and Fisheries has the overall responsibility for drinking water quality. Its executive agencies the National Food Administration and according to the

¹¹³ OECD. Sweden 2001. Changes to competition laws and policies, proposed or adopted. Summary of new legal provision of competition law and related legislation.

Food Act, the MCEH protection is responsible for the service provided and shall act in the interest of the consumers.

Target group

The instruments are initiated to improve the quality and the efficiency of the drinking water service provided by the operators. Decision-making processes at the communal policy level are influenced especially when the drinking water budget is part of the entire municipal budget.

Rationale

The national and international standards related to the quality of the drinking water supplied will motivate the municipalities and other institutions that provide drinking water to improve their quality.

Outcomes

Already 100% of the Swedish have access to drinking water services.¹¹⁴ In total Sweden has about 67,000 km of municipal water pipes. The quality of the provided drinking water in Sweden meets international quality standards. The price of the drinking water is low compared with other European cities.

5.3.4. Sewerage

Legislation in force

1971: Water and Wastewater law (1971:511)
 1999: Environmental Code

Objective

¹¹⁴ World Development Indicators, 2002, World Bank (from WHO-UNICEF, Global Water Supply and Sanitation Assessment, 2000)

Objective is to promote sustainable development that will assure a healthy and sound environment for present and future generations, by decreasing the pollution load on the receiving waters. The technology demands for wastewater are biological and chemical treatment

Instruments

The Environmental Code and the environmental objectives should be seen as non-rival supplements of each other. Sweden may have the most far-reaching effluent standards in the world for treated wastewater.¹¹⁵ Licenses are expressed as concentration in the residual water entering the receiving water. Emission standards are not used to any great extent. Typical limit values expressed in mg per litre are for organic matter (BOD7) 10-15, phosphorus 0.2-0.5 and nitrogen 10-20.

Actors of Implementation

The Ministry of Environment is responsible for Water protection. The Environmental Protection Agency on a central level, the county administration on a regional level and the MCEH on the local level provide the supervision.

Target Groups

Sweden has over 2,000 publicly owned sewage treatment plants. All operators of the sewage systems are targeted.

Rationale

Strict standards for effluent will control and minimise the damaging effects on the environment.

Outcomes

There are more than 2,000 wastewater treatment plants in Sweden and 92,000 km of sewers of which 32,000 km drainage pipes. The pipe material is 80% concrete, 13% PVC, 3% PE and

¹¹⁵ VAV, facts on water supply and sanitation in Sweden, 2000, p16

the rest other materials. The plants treat 1,500 million cubic meters of sewage water, drainage water and in-leaking water annually. More than 2 square kilometres of wastewater per year and 100% of municipal sewage is treated, but there is no plant for recycling wastewater.¹¹⁶ All people are connected to a wastewater plant. Today 58% of the population is connected to biological (phosphorous) treatment. Since the beginning of the 1990s plants have been complemented with nitrogen treatment, which means that 36% of the population is served by biological-chemical (phosphorous)-nitrogen treatment. The trend is towards minimising the use of chemicals in wastewater treatment by implementing biological purification methods. As regards sludge management, methods of separating out the phosphorus contents are being tested.

5.3.5. Treatment

Legislation in force

Environmental Code (1999)

Objectives

The objective of the current national and international regulation is to create a sustainable environment without limit the possibilities for future generations, by treating the wastewater thoroughly.

Instruments

The Environmental Code regulates effluents from wastewater plants. In the Code all central environmental laws are amalgamated into a modernised, broadened and tightened environmental legislation. According to the Code the operator is made responsible for an environmental plan and the measurement of the discharges (Environmental Code Chapter 5 paragraph 19). Every year the operator has to present an annual environmental report to the supervisory authority, normally the MCEH. The government is able to prohibit wastewater discharges if argument related to the ecology or the human health exists. The same act also

¹¹⁶ Round table discussion paper water supply and sanitation Nordic and Baltic and Barents Sea Regions

points out the discharge of wastewater must be permitted or notified by the government.¹¹⁷ In case of infringement of effluent standards stipulated in the permit the supervisory authority must report to the police or public prosecution authorities. The operator is directly accountable for any penalty that might follow. Other major legislation within the field is the Health Act, the Water Supply and Waste Water act and the Food Act. Permits for the discharge of treated sewage are granted by the Regional Environmental Courts for the largest plants. A Supreme Environmental Court deals with appeals. The County Administrative Board issues permits for most plants, and for the smallest plants the MCEH may give its approval.

Actors of implementation

The MCEH as being the responsible entity implementing and supervising the wastewater treatment operators. The Ministry of Environment and the Environmental Protection Agency are important actors of implementation with regard to the compulsory planning activities. The various courts are important for dealing with appeals and permit (withdrawals).

Target Groups

The Environmental Code states that the responsibility for regulated discharges is connected to the organisation operating the facilities. So, target groups are mainly the parts of the municipalities and PLCs that operate the wastewater services.

Rationale

The national and international standards related to the quality of the discharged wastewater after treatment will motivate the plants to improve their quality. Besides the motivation to become the best pupil in the European class the financial penalties from Brussels make it worthwhile to innovative because of financial reasons. Introducing the concept of the nutrients cycle the sustainability become clearer and measurements can be found to improve the sustainability.

Outcomes

¹¹⁷ Environmental Act, chapter 9, section 4 and section 6.

Currently at least 90 till 95% for the biochemical oxygen demand, the phosphorus and the suspended matter is removed and 20 to 50% of the nitrogen¹¹⁸. A clear decrease in the period 1988 to 1995 can be noticed, as presented in the following table in the nitrogen and phosphorus loading due to intensified wastewater treatment efforts.

Table 5-6: Wastewater Treatment and Nutrient loading from key sectors¹¹⁹

	Tonnes/year nitrogen				Tonnes/year phosphorus			
	Municip.	Industr.	Fish farms	Agricul.	Municipal.	Industr.	Fish farms	Agricul.
1988	25,600	7,400	295	65,100	1,040	770	36	390
1995	25,000	5,200	300	48,200	420	480	52	360
% decrease	2%	30%	-2%	26%	60%	38%	-44%	8%

5.3.6. Synthesis Table

5.3.6.1. Table for comparison

On the following page a table is presented that reflects a summary of chapter 3. For each element of the water cycle an analysis is provided in short statements of:

- The objectives
- The instruments
- The target group
- The actors of implementation
- The effects, divided in outcomes and outputs.

¹¹⁸ OECD, Conclusions and recommendations approved by the group on Environmental Performance at the 1996 meeting, Paragraph Water

¹¹⁹ The Finnish Environmental Institute, Evaluation of the implementation of the 1988 Ministerial Declaration, Helsinki, 2002



Table 5-7: Synthesis - Sweden

Public policy Water Cycle	Objectives	Instruments	Target groups	Actors of implementation	Effects
1. Resource access	To realise within a generation that the use of water is efficient, resource saving and environmental sound and that the preferred resources are renewable. By 2010 all water sources that are used to supply more than 50 persons or that supply more than 10 m ³ per day on average with drinking water will need to meet standards for good-quality in terms of anthropogenic pollution. In the year of 2015 a "good groundwater status" should be established.	<i>Pr.</i> Permits for abstraction Water supply plans Self-reg. Comprehensive Plan for Integrated Land and Water management at municipal level. <i>Inc.</i> Action program aimed at reducing nutrient-rich effluents intro freshwater bodies and the sea.	All landowners, municipalities, PLCs	Ministry of Environment, the County Administrative Boards, The MCEHs. The National Licensing Board, The Water Rights Court, the regional Environmental Courts	Implementation of the legislation is underway, although it can be said that the groundwater is of good status with regard to the anthropogenic pollution
2. Production	To ensure the consumers of drinking water of good quality, according to the same standards as apply for food stuff.	<i>Pr.</i> Drinking water Standards <i>Self reg.</i> Self control program regulating the frequency and type of quality control by the operator <i>Inf.</i> Publication of the results and monitoring <i>Inc.</i> Levies and charges	Municipalities, PLCs	Ministry of Agriculture, National Food Administration, MCEHs	The drinking water is of good tasting and have high quality
3. Distribution	A decrease of the residence time of the drinking water in the distribution network. Prevent improper use of water charges	<i>Pr.</i> Drinking Water Standards at the level of the end user. Possibility to issue injunctions and/or prohibition of use. Separation of the administration of water supply and sewerage services from other municipal budgets. <i>Self reg.</i> Self control program regulating the frequency and type of quality control by the operator <i>Inc.</i> Water charges <i>Inf.</i> Publication of the results	Municipalities, PLCs	Ministry of Agriculture, National Food Administration, MCEHs	100% of the people have access to drinking water services. The quality of the drinking water provided is good and the price is relatively low.
4. Sewerage	To promote sustainable development that will assure a healthy and sound environment for present and future generations, by decreasing the pollution load on the receiving waters	<i>Pr.</i> The most far-reaching effluent standards in the world. Licenses for wastewater emission. Regulate rights of property owners to use sewerage system.	Municipalities, PLCs, Industries	Ministry of Environment, Environmental Protection Agency, County Administrative Council, MCEH	100% of municipal sewage is treated, all people are connected to a wastewater plant.
5. Treatment	To promote sustainable development that will assure a healthy and sound environment for present and future generations, by treating the wastewater thoroughly.	<i>Pr.</i> Environment Plan and measurement of the discharges. Permits for wastewater discharge issued by the government. Possibility to prohibit discharges; penalties and fines.	Municipalities, PLCs, Industries	Ministry of Environment, Environmental Protection Agency, Regional Environmental Courts, County Administrative Council, MCEH	At least 90 till 95% for the biochemical oxygen demand, the phosphorus and the suspended matter is removed and 20 to 50% of the nitrogen

5.3.6.2. National Model: Main Characteristics

Main characteristics of the Swedish model for the WSS Sector are:

- Sweden is one of the world's richest countries in terms of availability of fresh water.
- In most cases one organisation, the municipality holds in one hand the water supply and the wastewater services. Traditionally the WSS provision is firmly in the hands of the municipalities (289 in total), as such municipalities are the main actor in the WSS sector.
- In Sweden the Water and Wastewater Law from 1970 prohibits profit making on water supply and wastewater services. This regulation is an important obstacle for private sector involvement.
- The Swedish produce one of the least expensive drinking water qualities in Europe, despite:
 - The Swedish population is small in number (no scale advantages)
 - Huge parts of Sweden are sparsely populated (relative large quantities of network per connection)
 - The drinking water is an important foodstuff with very high requirements to its preparation and quality.
- The Swedish people have a relative large consumption of water compared to other European countries.
- In small municipalities there is still some subsidising of the water tariff.
- The Swedish WSS sector went through a severe efficiency operation, decreasing staff by almost half in 10 years.
- The establishment of PLCs is a strong new trend in the Swedish WSS sector.
- Private Sector involvement in the WSS sector is a new phenomenon and it started in the smaller municipalities. There is currently one fully privatised municipality and seven

management contract with private parties, of which one is concluded with a foreign party (being Vivendi).

- Sweden's performance in terms of municipal sewage treatment is among the best in the OECD.¹²⁰ Close to all urban households are provided with both biological and chemical wastewater treatment, achieving removal rates of 90 to 95% for biochemical oxygen demand, suspended matter and phosphorus, and 20% to 50% for nitrogen.

5.4. FUTURE TRENDS IN WATER PLANNING AND MANAGEMENT

In this paragraph the triggers of change in the Swedish WSS sector will be described. The current as well as the emerging legislation is analysed. The chapter is finalized with the overall trends in the Swedish water sector.

5.4.1. Emerging Legislation

In March 2002 the Social Democratic Government ordered, in perspective of recent privatisation development, an investigation (M 2002:02 Utredningar om översyn av Välagstiftning) of how to redraft the existing laws. The Government states in particular that it is a 'public task' to provide water supply and sewage disposal services. The investigation, led by Director General Jörgen Qviström at the Environmental Department, is to report to the government at the latest 1st June 2004. This investigation is according to many people in the water sector to be viewed as a very strong political statement. The outcome will probably permanently stop further privatisation.¹²¹

On the 25th December 2003 the new version of the directive from the National Food Administration concerning Drinking Water will come in force. This redraft will adjust the national legislation to the European Drinking Water Directive.

¹²⁰ OECD Report Sweden, 2003

¹²¹ Aqualibrium project, Sweden Country Report 2003

5.4.2. Overall Trends

5.4.2.1. Cost recovery

In some small municipalities the tariffs are subsidised by means of a contribution from local taxes. However because of high local taxes at present, politicians are forced to cover more and more of the costs through water charges.¹²² With respect to possible liberalisation, municipalities might be earlier inclined to support private sector involvement to be able to get rid of the budgetary burden of subsidizing the sector.

5.4.2.2. Increased regionalisation and establishment of Public Limited Companies (PLCs)).

There is a strong trend of establishing municipal PLCs in Sweden. In 1995 there were 17 PLCs and this amount was already doubled five years later in 2002. Several examples of increased regionalisation arose the last years. An example of this is Kappalaforbundet, where a sewage treatment plant association is treating wastewater from several municipalities in the northeastern part of the Stockholm area. Stockholm Vatten AB is operating as principal in two adjacent municipalities (Stockholm and Huddinge). Roslagsvatten AB is doing a similar construction, as it is operating as principal in the two adjacent municipalities of Osterakera and Vaxholm. The regional supplier in the very south of Sweden, Sydvaten AB, is owned and used by twelve municipalities. Another example is SYVAB, a wastewater treatment in the southwestern part of the Stockholm, as it is owned by and serving six municipalities.

5.4.2.3. Multi utility companies

The majority of the established PLCs are multi-utility companies with activities in fields as electricity, waste, roadwork and district heating. Only a minor number are strict water companies (5) as Stockholm Vatten AB.

¹²² EUREAU, Management Systems of Drinking Water Production and Distribution Services in the EU Member States.

5.4.2.4. Benchmarking

Stockholm Water Company together with several other water companies started to formulate indicators that can be used in a benchmark study. Two Swedish benchmarking projects started during the 1990s to enable internal and external comparisons. The DRIVA¹²³ project initiated by The Swedish Water and Wastewater Association and the 6-City-Cooperation initiated by Stockholm, Gothenburg, Malmö, Helsinki, Oslo and Copenhagen.^{56, 57} In the year of 1997, the VAV(Swedish Water and Wastewater Association) arranged a competition among the Swedish water works.¹²⁴

5.4.2.5. Increase of the relative share of goods and services bought in the private market.

A large part of the services and materials needed to operate the municipal facilities are put out to tender on the private market. Most of these contracts are short-term contract with renewal once a year or every second year. Many municipalities aim to increase the degree of total costs spent for material and services bought in competition. For example, the Stockholm Vatten AB increased during the last four years the relative share of goods and services bought in the private market from 67% to 73%

5.4.2.6. Technology

New methods such as the separation of urine, biological treatment to minimise the use of chemicals are currently under research and may in the future be implemented. Also currently a large number of water pipes in houses are made of copper, this causes release of copper that is harmful to the user as well as to the sludge. Research has indicated that stainless steel may be an alternative. Moreover the tendency is to use ICT-solution in all possible applications.

5.4.2.7. Reuse of sludge

The general goal is to reuse contents of nutrients, especially phosphorus. This may be done through land application, by incinerating it and extracting the phosphorus out of the ashes or by extracting the phosphorus directly out of the sludge (for example through hydrolysis).

¹²³ Helland and Adamsson, Performance indicators: benchmarking between six cities in Scandinavia, *Aqua* Vol. 47, No. 6, pp. 284-288, 1998

¹²⁴ IWA, 2000, 322

5.4.3. Liberalization: Current State

The relatively high satisfaction of the customers with the current level of delivered WSS services form an obstacle to possible change. The urge for changes seems absent, due to the high service levels and the low pricing. A telephone survey from 2000 gave the following result how the public perceive the water sector:

- 94% regard the drinking water quality to be quite good or very good
- 88% felt rather strong confidence or very strong confidence for the local supply of drinking water.
- 84% believe the local water work to be capable to continuously deliver a good and high quality drinking water.

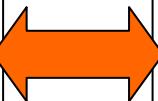
The private sector involvement in Sweden is only recently established and very limited. There is one municipality (Norrköping, the eighth largest town of Sweden measured in number of inhabitants) where a privatisation model is applied. Apart from this case there are some cases (7) of small municipalities where management contracts were closed. Remarkable is the short time of the contract period. From a total number of 289 municipalities, these are only small portions.

Recently several articles advocating public ownership or private involvement have been published in national newspapers. Water professionals have debated the privatisation issue on a national level in the professional journals, Svenskt Vatten and Cirkulation, and at conferences. Most of the water professionals work directly under politician control. To express opinions about political decisions can therefore, especially in smaller municipalities, be sensitive. A number of professionals have however taken a public standpoint against. To draft an impression of the ongoing discussion some illustrative opinions are summarized in the following boxes:



Figure 5-4 Illustrative opinions in the ongoing liberalisation debate¹²⁵

Bengt Egard, at Sydkraft AB and former manager of Norrköping Environment & Energy Company AB expresses his opinion, in Svenskt Vatten, about private ownership. He thinks the prohibition to make profit declines the number of private companies interested in participating in the drinking water and wastewater industry. The effectiveness of the sector won't be optimal



Chief Engineer Sven-Eric Kristenson in Gothenburg and Sverker Westman at Stockholm Water have expressed arguments representative for many water professionals opposing privatisation. The fact that water is a life necessity and water supply constitutes a natural monopoly is a strong argument for not privatising the water sector. They argue that already as much as 70% (in Stockholm even 73%) of all

The present Social Democratic Government is also involved in the debate and is seemingly taking the side of the anti-privatisation group. The government very specifically views drinking water and sanitation as a public good and is currently investigating a redraft of the Public Water and Wastewater Plant Code to limit the possibilities of private sector involvement.

5.4.4. Liberalization: other sectors

In other sectors Sweden is often one of the early adaptors of liberalisation. Swedens' post market is an example of a fully liberalised market, one of the first in Europe. The stable and largely successful traditional monopoly regime was challenged in the 1980s by the development of new technologies and the general trend towards market orientation and competition. Also in 1993, Sweden had one of the most liberalised telecommunications markets in the world. The process of liberalisation included opening the market to competing telecommunications equipment and networks, the transfer of regulatory responsibilities to an independent agency and the corporatisation of the Swedish Telecommunications Administration, Televerket. The State-owned company, Telia AB, was established in 1993 together with the new Telecommunications Law. Experiences with liberalisation of the

¹²⁵ From the Aqualibrium project 2003, Country Report Sweden

electricity market in Sweden are encouraging. The electricity prices for consumers for 1-year contracts have decreased with 50%, between January 1999 and November 1999.¹²⁶

5.4.5. Liberalization: future?

At a national and ideological level there is a clear shift in parties in favour and against further private sector involvement in the WSS sector. The Conservatives, the Christian Democratic Party, the Liberals and The Centre Party are generally in favour of more private initiatives while the Social Democrats, the Left Party and the Green party are against. Let aside the debate at national level, the real issue of private sector involvement seems to be much more at the level of the municipalities. According to the law the prime responsibility of the WSS services lies with the municipalities, and as such they are the most important driver or obstacle to change. Until now only very few of the 289 municipalities choose to involve the private sector.

At national level it is difficult to forecast the outcome of this debate, but increasing complexity and higher environmental and quality demands will make it harder and harder for the smaller municipalities to obtain the necessary competence and keep pace with crucial technical improvements. Thus, a future with increased alliances between municipalities as e.g. regional co-operation and possible involvement of the private sector appears to be the Swedish way.¹²⁷

¹²⁶ Publieke belangen en marktordening, Ministerie van Economische Zaken, 1999

¹²⁷ Mats Lannerstad, Water Supply and Sanitation in Sweden, a Public Trust

5.5. CONCLUSION

The conclusion of the analysis of the legislation and emerging legislation in Sweden especially with respect to the issue of liberalisation is composed of the following elements.

Firstly, the evolution of the laws in Sweden in the WSS sector is clearly defined in three stages. The original objective of the introduction of drinking water and sanitation services was to improve the public health conditions. Therefore all over Sweden, and especially in the urban areas, water and wastewater infrastructure was constructed in the beginning of the 20th century. A major shift of focus took place in the second half of the 20th century when environmental issues became important. Due to this a piecemeal of legislation was prepared and implemented. This amongst others resulted in the construction of high-level wastewater treatment plants. The last major shift came at the end of the 20th century when the focus came on the gaining of efficiency improvements and overcoming the lack of financial means at municipal level. This resulted, particularly in the smaller municipalities, in private sector involvement and the co-operation of municipalities in PLCs.

Analysing the water cycle components (resource access, production, distribution, sewerage and treatment) the high levels of service provision are notable. Policies, instruments and implementation managed to establish a very high level of control and execution of the services at all levels of the water cycle. This is reflected in the prescribed water and wastewater discharge standards that are amongst the highest in the world.

Overseeing the whole period and the complete water cycle, one central element remains stable, that is the key role of municipalities as the main actor in the WSS provision. The Water and Wastewater Law from 1970 is the legal framework on which this role is legitimated. For the future water and wastewater provision a lot will depend on the capabilities of the municipal managers in which direction they choose to go to overcome the challenges the sector faces, such as higher complexity, increased financial pressure and increased demands from consumers. Private sector participation might be one of several options for a municipality to choose from.

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6. CHAPTER 6: COUNTRY REPORT ITALY

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ACRONYMS

AATO	<i>Autorità di ATO</i> , Authority of ATO
ATO	<i>Ambito Territoriale Ottimale</i> , Optimal territorial area
ACEA	<i>Azienda Comunale Elettricità e Acque</i> , Energy and water holding
AMGA	<i>Azienda Mediterranea Gas e Acqua</i> , Multi-utility for gas, water supply, sanitation, electricity, telecommunication
ANPA	<i>Agenzia Nazionale per la Protezione dell'Ambiente</i> , National Agency for the Protection of the Environment
ARPA	<i>Agenzia Regionale per la Protezione dell'Ambiente</i> , Regional Agency for the Protection of the Environment
CIP	<i>Comitato Interministeriale Prezzi</i> , Interministerial price committee
COVIRI	<i>Comitato di vigilanza sull'uso delle risorse idriche</i> , Committee for the vigilance on the use of water resource
CPP	<i>Comitato Provinciale Prezzi</i> , Provincial price committee
EU	European Union
IRSA	<i>Istituto di Ricerca sulle Acque</i> , Water research institute
SII	<i>Servizio idrico intergrato</i> , Integrated water service
SpA	<i>Società per Azioni</i> , Joint-stock company
USL	<i>Unità Sanitaria Locale</i> , Local health units
WSS	Water Supply and Sanitation

¹²⁸ The authors are very grateful to Vania Paccagnan (IEFE, Università Bocconi) for the re-reading of the document and useful comments on a previous draft.

6.1. INTRODUCTION

Italy is a contrasted country in terms of water resources and management. According to Massarutto (2001), Italy is one of the richest countries in Europe in terms of rainfall, but also one in which a significant part of the population is not sufficiently supplied in water. The water industry in Italy is at the highest level of fragmentation with 13,000 networks and a similar number of operators (even if since the Galli Law in 1994, one assists to important change towards regionalisation), but at the same time the decision-making is highly centralised in Italy. The water and sewerage charges are ones of the lowest in Europe but at the same time there is an urgent need of financial resources for new investments. Italy is dominated by a rigid and formal command-and-control approach to environmental regulation, but it presents the poorest levels of effectiveness in the implementation and enforcement process.

As noted by Buonora (2002), for a long time water has been considered in Italy mainly by the point of view of drainage and irrigation, and Vitolo (1998) to say that further thought needs to be given to the problems of water resources management, concerning the scarcity and the non-fitted management characterising the large areas of Southern Italy and more generally all the Mediterranean zone. In order to rationalise the water management in Italy, important reforms have occurred in the past 20 years at central and regional levels, and have radically reshaped the structure of water resources planning, environmental and water quality regulation, and the organisation of public utilities in the water sector.

The most important of these reforms is the Galli Law (L. n.36/1994), the national Act of 5th January 1994 providing for the restructuring of the water industry, but which was implemented by the first municipalities only at the beginning of the year 1999. The Galli Law organises water supply and sanitation through the aggregation of municipal utilities into single territorial units. Completed by regional legislation, the Galli Law allows a considerable degree of freedom to municipal authorities in choosing the organisational structure of the WSS operation (publicly-owned company, public-private partnership, delegation to a private operator).

We are going to develop an overall presentation of the main issues concerning the legislation and emerging regulation in the Italian water management. From a brief description of the

institutional framework and the specificities of water resources in terms of availability and use, we review the history of water laws in order to identify the different phases of the Italian water regime changes. We then analyse the main structural features of Italian water policies to highlight the difficulties of Italy to meet the standards of European legislation and try to design future trends in water planning and management.

6.2. GENERAL FRAMEWORK FOR WATER MANAGEMENT (INCLUDING ACTORS)

6.2.1. *Institutional Framework*

Italy is a parliamentary Republic. The territory is divided in 20 regions (with a real political power since the 1970's), 100 provinces and 8170 communes, see Figure 2-1. For several years, the Italian authorities have carried out an important decentralisation of competencies in many fields, and in particular in the agricultural, energy and environmental fields. Some regions have more autonomy (e.g. Trentino, Valle d'Aosta), but this does not affect the implementation of the national laws. We will focus our analysis on the general regime (valid for most of the country and the population).

Historically the municipalities are responsible for the WSS but the Galli law in 1994 introduced a new organisation of WSS in order to rationalise the water management with the creation of optimal territorial areas (ATO, *Ambito Territoriale Ottimale*) with new authorities (AATO, *Autorità di ATO*) under the responsibility of regions. The institutional actors implied in the reform of water management are numerous and intervene in different registers, as well territorial (delimitation of the ATOs), economic (choice of the operators) or financial (programming of the investments). An independent regulatory body (COVIRI, *Comitato di vigilanza sull'uso delle risorse idriche*) has been created to facilitate and control the application of the reform and to defend the interests of the users.



Figure 6-1: Map of Italy



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6.2.2. Resource Status and Resource Use

The 2002 estimated population is 57,715,625, giving the country an average population density of 192 persons per square km. The country can be generally divided into the more urban north and the mostly rural south. The more prosperous north contains most of Italy's larger cities and about two-thirds of the country's population; the primarily agricultural south has a smaller population base and a more limited economy.

Italy has many rivers, of which the Po and the Adige are the most important. The rivers of the Italian Peninsula are shallow, often dry during the summer season. However, the resource is



relatively abundant in Italy but the local situation depends strongly on the geographical context (see Table 2-1).

Table 6-1: Availability of water resources in Italy

Hydrologic area	Rainfall	Storage capacity	Surface water available	Underground water available	Total water available
Po Basin	71.800	2.194	16.118	4.468	20.586
North East	42.900	1.069	10.939	1.721	12.660
Liguria	6.400	29	372	307	679
Romagna-Marche	20.700	212	995	620	1.615
Toscana	20.900	141	543	440	983
Lazio-Umbria	24.100	452	1.399	1.126	2.525
Abruzzo-Molise	11.900	603	2.454	248	2.702
Puglia	13.200	397	523	325	848
Campania	23.200	77	1.237	929	2.166
Calabria-Lucania	24.000	1.131	2.514	595	3.109
Sicilia	18.800	718	738	1.151	1.889
Sardegna	18.800	1.403	1.841	217	2.058
Italy	296.700	8.426	36.673	12.147	51.820

Source: IRSA (1999). Values are expressed in thousands cubic meters.

In the North, the resources are abundant (thanks to mountains, alpine-type rivers, natural storage capacity provided by glaciers and lakes, regular precipitation). In central and southern regions and in the islands, available resources are much lower due to a Mediterranean climate (extreme variability of rain during the year, drought in the summer...). Some regions (e.g. Calabria, Sicilia) suffer from water scarcity with a strong effect on WSS (interruption of service).

Concerning the quality of water, the situation is also very variable but generally poor. It is often said that there is a general deterioration of river quality, see Massarutto (1999). This situation arises in particular when medium or small streams drain areas with high urban and industrial concentration (e.g. the river Lambro draining the area of Milano, the lagoon of Venice, the reaches of Po, Arno and Tevere downstream the cities of Torino, Firenze and Roma). Given the geographic structure of the country, there are many areas that are



vulnerable to nutrient pollution, in particular large lakes and the upper Adriatic Sea, to which flow the rivers draining the most densely populated and industrialised part of the country. Most of the inhabitants and the industries (e.g. tanning and textile industry) are concentrated in the Northern regions with a strong impact on water quality, as only 2/3 of the pollution load are treated yet. In Southern regions, the problem of salt intrusion can threaten the availability of water for general uses. Moreover, food industry is an important cause of severe pollution and intensive agriculture leads also to soil and groundwater contamination, see Goria and Lugaresi (2002).

In the last 20 years, the quality of underground resources has been rapidly deteriorating in many areas of the Country. The impact of agricultural pollution on underground water is relevant basically due to several factors: bacteriological pollution (especially from open-air livestock), nitrates from artificial fertilisers and livestock waste disposal, pesticides, and toxic substances from non-natural fertilisers (e.g. waste-derived compost, sewage sludge). Nonetheless, the diffusion of this phenomenon is highest in the North of the country, especially in the Po plain or in the North East. On the contrary, in the Mediterranean Italy, this particular problem is much more limited and to some extent easier to manage, since surface water resources and springs are more important sources for public supplies.

Northern Italy alone accounts 67% of total water consumption while the consumption is 25% in the Centre and the South, and 8% in the Islands. Generally, Agriculture uses 50% of the consumed water (but it can be much more in the South or in the Islands) whereas the domestic consumption represents less than 20%. The uses of resources in WSS are also very heterogeneous. In the North, 90% of the water comes from groundwater whereas in the South and especially in the Islands, water supply is more dependant from surface water, reservoirs, and transfers (from 15 to 25%). These patterns of water use are important implications in the organisation of water supply: in the North, water supply is highly segmented while in Southern Italy uses are very interdependent and they often rely on the same large water storage and transfer schemes. Table 2-2 shows the distribution of drinking water in Italy.

Table 6-2: The distribution of drinking water in Italy in 1999

	North	Centre	South	Italy
Water delivered per capita:				
total	303	275	228	267
relationships between areas	100.0	90.8	75.2	
For domestic uses	217	202	186	200
relationships between areas	100.0	93.1	85.7	
Losses (% of water distribution)	23.31	27.50	36.36	28.51
Invoiced water:				
- % domestic uses	71.6	73.4	81.4	74.8
- % civil uses (non domestic)	10.1	17.5	10.4	11.7
- % for civil users (sum)	81.7	90.9	91.8	86.5
- % for productive users	18.3	9.1	8.2	13.5

Source: Presentation to the Parliament on the state of the water services - Comitato per la vigilanza sull'uso delle risorse idriche - Year 2002.

6.2.3. General Description of the History of Water Laws (until Today)

According to Massarutto (1999), the last century was marked by the progressive renunciation of the nature of "free good" of the water to enter the public domain. This process of development of public rights on water resources has witnessed a substantial acceleration in the last 2 decades, in particular due to the increased role of the EU as a driver of environmental policy. The largest part of environmental legislation in Italy can be regarded as a consequence of the implementation of European Directives. The history of water laws can be divided in 3 phases. The first one evolves between 1865 and 1971.

6.2.3.1. The setting-up of water policy (1865-1971)

The complete history would start with the building of networks in the Antiquity but if we focus on contemporary history, we could study the history until the 1970's. The first law on water policy (L. n.2248/1865) defines a very simple regime to authorise water use. It focuses on protection of lands and population from water through hydraulics works. Different fragmented policies dealt with water (e.g. navigation, agriculture) but this policy did not

coordinate the different uses. In 1933, in order to revise the previous regime, a new water policy was established by way of an unified code of the dispositions of law on waters and electrical systems (R.D. n.1775/1933). The regulation of water uses is developed in separate domains (e.g. irrigation, navigation, civil use) to form a simple policy regime covered by fragmented and separated regulations.

A Law in 1963 (L. n.129/1963) is considered as the first organic attempt to plan in the water sector. It defined a general regulatory plan for water supply, and divided Italy in different water districts, depending on administrative and historical properties, which were expected to set up a water needing and water feeding master plan. The structure of water supply system is strongly dependent on the state of the resource (see above): in the North, water supply is highly segmented, industries are self-supplied, agriculture irrigation is managed by farmers associations. In the South, the scarcity of resource leads to creation of big infrastructure, managed often by state-owned organisations, which provide every water use.

6.2.3.2. The time of regionalisation (1972–1993)

The second phase beginning with the reform of State and the transfer of functions to the Regions opens up the way of the empowerment of local level and the first water protection policy. The municipalities are still responsible for the organisation of the service, but the regions are more and more implicated in the implementation of national laws and management of water at the local level. This process started in 1972 but was really implemented later and still evolving (L. n.112/1999). Minor hydraulic works and concession authorisation are transferred to the Regions and later (L. n.616/1977) the management to aqueducts sector.

This local regulation transfer is also perceptible in the tariff setting. The price system in Italy fell under the authority's control in 1944 with the founding of the CIP (*Comitato interministeriale prezzi*). Water price setting is also controlled. In 1974, the role of the CIP is transferred to the provincial level (CPP, *Comitato Provinciale Prezzi*) with the aim to connect prices to management costs. But in 1984, the increase of tariff was limited to the increase due to the anticipated inflation. Between 1987 and 1990, the finance law authorises not to comply with the former rule in order to cover at least 60% of the cost with the tariff. However, the service couldn't do benefits but the rules for tariff setting were more complicated. The

provincial committee disappeared in 1994 and a transitory measure was set before the implementation of the reform.

As noted by Guérin-Schneider, Nakhla and Grand d'Esnon (2002), through the tariff regulation, two trends are opposed: restraint of inflation and recovery of cost that make the tariff rules change during this period. We also see the opposition of national role and implementation at a local level (province role). During this period the Italian prices for water were the lowest in Europe.

As far as the water protection is concerned, 1976 is a year of great shift in water policies in Italy. Previously water had been considered as a good to be exploited; now it is to be protected. The Merli law (L. n.319/1976) is the first and important law concerning water pollution. It introduced a regulation for wastewater discharge and a planning for water use and protection. The law was also designed to introduce general criteria for water use management of WSS public services, and quantitative and qualitative indicators. Regions and municipalities are responsible for controlling, planning and organising the activities at the local level.

The law L. n.183/1989 deepened the water regulation framework. It defined River Basin for integrated water management, headed by Water Authorities, where both State and Regions participate, and introduced water basin plan that should regulate withdrawals. The territory is divided in 11 National Basins, managed by 6 Basin Authorities and 18 Inter-regional Basins (involving regions and State administration) and regional basin, whose management is delegated to Regions. This law introduces the *Piano di Bacino*, a plan which establishes policy objectives at Basin scale, concerning flood defence and resource use planning.

6.2.3.3. The reorganisation of water supply and sanitation sector (since 1994)

The Galli Law (1994)

The Law L. n.142/1990 laid out that the municipalities (and Provinces) was qualified as regards local public services. But since 1994, there is a consequent reorganisation of WSS and reinforcement of water policies. In 1994, the global reorganisation of WSS started with the Galli Law (L. n.36/1994). This law introduces a new level for the management of WSS: the



optimal territorial area (ATO, *Ambito Territoriale Ottimale*). Within the ATO, only one operator manages the whole service (SII, *Servizio idrico integrato*: SII stands for integrated water service, i.e. water supply, sewerage and treatment). The regions are responsible for the implementation of this new law as they design the ATO's borders and the framework for the intercommunal cooperation, and they create the framework for contract with the manager of the WSS. In most cases, the ATO's borders were nearly the provinces' borders and the province was the coordinator of the communes involved. In some cases, only one ATO was designed within the region (e.g. Puglia, Basilicata, Valle d'Aosta, Sardegna). The main forms of cooperation between the communes are the "*convenzione*", a convention between the communes often under coordination of one big commune or the province and the "*consorzio*", the creation of a new local authority dedicated to WSS.

Once the Region finished this step, the reform can be implemented at a local scale. The AATO (*Autorità di ATO*) is the local authority organising the WSS within the ATO. The AATO has to run a survey of the state of WSS in the ATO and build a plan (*Piani di Ambito*) for investments and objectives for 20-30 years. Then the AATO can delegate the integrated service to an operator.

In the Galli law, there exists a clause (Management of the safeguard areas, *Salvaguardia* principle) that permits to keep for a temporary period the operator in place if it operates efficiently. Several measures permit temporary adaptation to local situation (for example, in Torinese, there are two operators in the ATO, instead of a unique). The Galli Law establishes also a principle of full recovery of costs.

Lastly, concerning the possibilities of concession of water services introduced by the Galli law, this is the Decree n.280/2001 that establishes the modalities of delegation in concession to third parties of the management of the integrated water service. In particular, the AATOs proceed to the delegation of the management of the integrated water service, by means of public bid, adopting for the award the system of the economically best offer. Moreover, Law n.448/2001 (*Legge finanziaria 2002*) has introduced compulsory competitive tendering for local public services, but it also defines the so-called "safeguard period", so that competitive tendering is not necessarily operational immediately. The law 326/03 (*Legge Finanziaria 2004*) modified the law 448/2001, allowing the following forms of WWS management:

- delegation through a public bid.
- Direct assignment to a public-owned company, with local shareholders (in-house company). In this case, the company cannot participate in other water service management.
- Direct assignment to a public-private company when the private part is issued from a public bid.

These forms were elaborated in response to a claim from the Commission who accused Italy not to respect the directives on assignments of public services.

Water resource protection

The law Decree n.152/1999 aims to integrate the different policies (regarding environment, health and economics) in a global policy for water resources and transcribe EU directives (91/271 on wastewater treatment and 91/676 on protection from nitrates). It constitutes a lawful framework for the protection of surface and underground waters. It describes the general environmental objectives: to prevent and to reduce the pollution and to put into effect the reorganisation of the polluted water bodies; to achieve the improvement of the state of waters and adapted protections of those destined to particular uses; to pursue sustainable and durable uses of the water resources, with priority for the drinkable ones; to maintain the natural ability to clean up of the water bodies in order to protect the fauna and the flora. To meet these objectives, the Decree stated that Regions must implement a set of measures, to be established in the *Piano di Tutela*.

The regions are responsible to elaborate regional plans (*Piani stralcio*) for water protection and from these, limits for discharge are elaborated.

6.2.4. Main Public and Private Actors Involved

6.2.4.1. National level

The Galli law has created a committee of vigilance (COVIRI - *Comitato per la Vigilanza sull'uso delle Risorse Idriche*), near of the Ministry of public works, to monitor the implementation of the reform. Now it depends on the Ministry for Environment (it cannot be

considered as an independent authority of regulation). The role of the committee is still to define and will work fully when a minimum of ATO and SII would be created. Besides the task to guarantee the observance of the principles of the law on reform of the water services, the committee has to regulate the determination and the adaptation of the rates and to protect the interests of the customers. Today, it is question of organising a benchmarking process between the operators (maybe yardstick competition).

At the national level, there is also a national agency for the protection of the environment (ANPA, *Agenzia Nazionale per la Protezione dell'Ambiente*) that depends on the Ministry of the environment and defines the rules, norms and standards for water discharges. The Ministry of Health is responsible for quality control.

Since 1999, competences of the Ministry of public works were divided into two ministers:

- the Ministry of environment is responsible for water services. It provides general framework for the level of service (very general, such as continuity...) and rules for tariff (normalized method for calculation).
- The Ministry of infrastructure has an important role in national scale infrastructure management (such as long-distance water supply). The general direction for the networks is responsible for the assignment of charges for a best use of European structural funds in favour of the regional programs in the field of water resources

6.2.4.2. Regional level

The Regions are quite powerful political levels in Italy since the 70's. They are a key actor in the implementation of the Galli law, as they design the ATO borders (that should respect water basin borders) and the mode of cooperation between the communes, provide regional frameworks for contracts between AATO and operators. They also have a role in the water sector, as they are responsible for the regional water basin (monitoring of the quality and the quantity available). They design plans for water use, etc... Moreover, they collect taxes for themselves for the withdrawal of water (groundwater, springs).

At the regional level, following the creation of ANPA in 1994, each region in Italy was required to set up its own branch (ARPA, *Agenzia Regionale per la Protezione*



dell'Ambiente), replacing the local health units (USL, *Unità Sanitaria Locale*) in dealing with environmental issues. They monitor the operator as they control the other industrial actors on his discharges of water and other environmental impacts.

Created by the law in 1989, the Water Basin Authorities, and endowed with technical skills and financial means, are entitled to water planning in the water basins under their authority. In particular, the basin plan must ensure a rational use of surface and underground water resources, with the guarantee that water withdrawals will not compromise the water minimum constant vital flow.

6.2.4.3. Local level

At the local level, the ATO is a new administrative scale devoted to WSS management. The AATO is the political structure that runs ATO, composed of representatives of the communes and the province(s). The AATO designs a plan (*Piano di Ambito*), with planned investments (for 20 years, and divided after in 5-years sub-plans) to be realised by the operator. It chooses the mode of management considered as the most appropriate, designs the contract, chooses the unique operator and controls this operator (in fact whether it respects the terms of contract or not).

The operator is chosen by the AATO for the geographical area of ATO and the whole WSS (SII: water production and distribution, wastewater collection and treatment). This operator is a joint stock company but the ownership may be private, public or mixed. Under the pressure of the reform of water sector, the municipality owned companies, the consortia and the public boards are progressively transformed in joint stock companies. In addition, the capital of these companies is more and more sold to private operators. Moreover, the budget law for the year 2002 has stipulated that the preferred structural form for the management of water services in the future will be joint stock companies. Figure 2-2 shows the organisation of actors in the water sector.

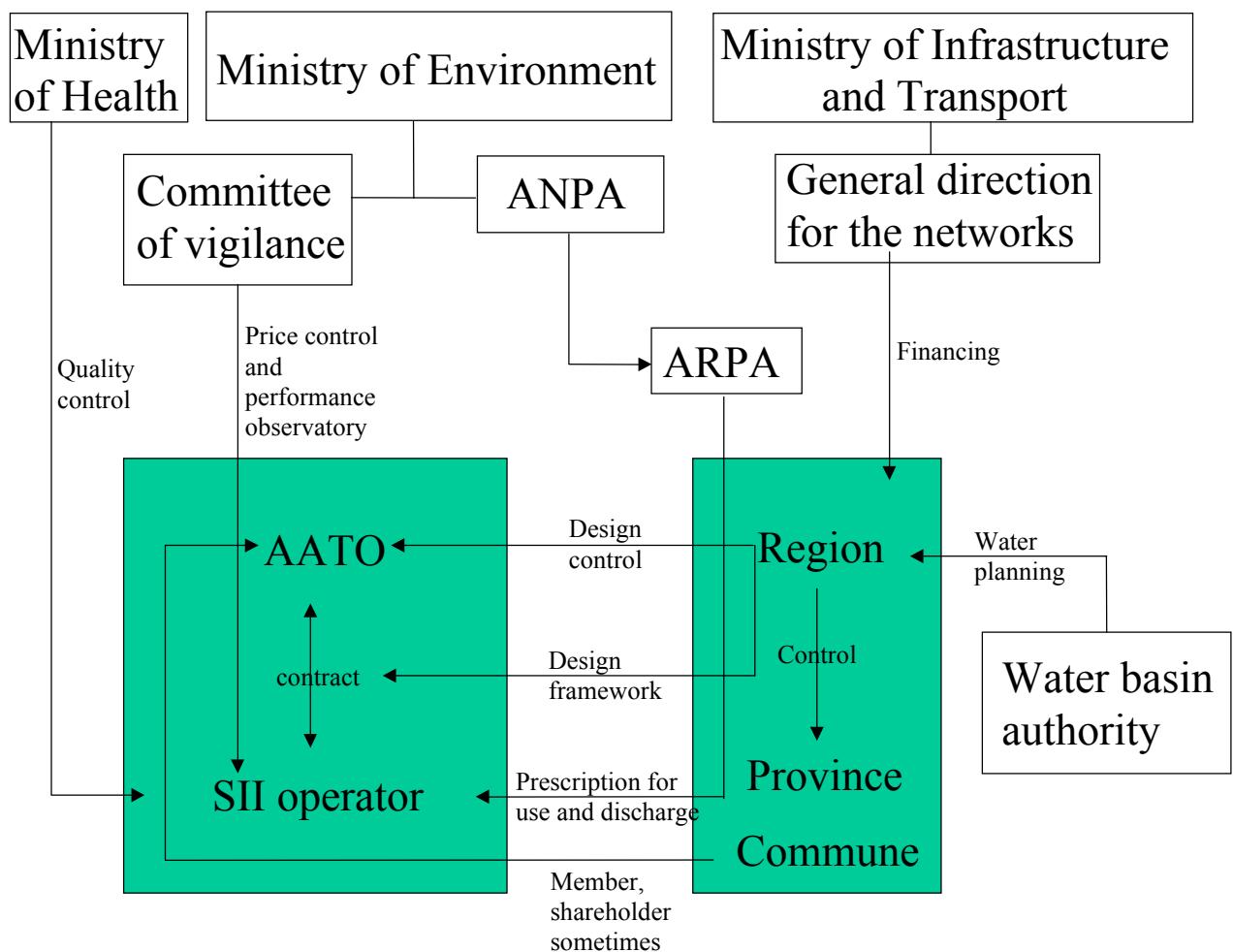
As noted by Asian Development Bank (2001), many municipalities have tried to keep control of their local services by awarding the concession to existing municipal operator. For instance in Rome, ACEA has been awarded a 30-year contract. In Genova, AMGA has achieved the



same type of contract. New legislation is designed to prevent this competition problem, with all new liberalisation schemes being attributed to individual operators through public tenders.

Private firm involvement is concentrated in a few companies. A large part of production and distribution is managed by Italgas-Eniacqua and CREA SpA (Pesenti group). Italgas currently manages around 415 contracts, distributing about 300 million cubic meters of water to 2.7 million people. Foreign groups have recently entered the sector too, particularly through cooperation between AMGA Genova and Lyonnaise des Eaux.

Figure 6-2: Organisation of Water Actors in Italy



6.2.5. Summary table

Table 6-1 summarises the different phases of the water policy design in Italy.



Table 6-1: Phases in the development of the policy design concerning water policy in Italy

Phases	Policy design	Actors of implementation
1. 1865 - 1971	<p><u>Objectives</u>: To protect land and population from water, to regulate uses of public waters</p> <p><u>Causal Hypothesis</u>: If we regulate alternative uses of water, then we avoid potential conflicts between users</p> <p><u>Instruments</u>: Concessions authorisation</p> <p><u>Target groups</u>: Water users</p>	State Ministry of Public Works Municipalities
2. a 1972 – 1993 Regionalisation	<p><u>Objectives</u>: To give local authorities more power for better efficiency</p> <p><u>Causal Hypothesis</u>: If we give region more power, then we will improve the efficiency of the State</p> <p><u>Instruments</u>: Transfer of competences (hydraulic works, authorisation for use, aqueducts sector regulation)</p> <p><u>Target groups</u>: Regions, provinces</p>	State Ministry of Public Works
2 b 1972 – 1993 Water resources protection	<p><u>Objectives</u>: To protect water resource and public health</p> <p><u>Causal Hypothesis</u>: If we protect water resource, then we will improve water quality and public health</p> <p><u>Instruments</u>: Regulation of discharge, basin plan for use and protection</p> <p><u>Target groups</u>: Communes, industries, operators</p>	Ministry of Health Water basin authorities Regions
3.a 1994 – 2003 Galli Law WSS reorganisation	<p><u>Objectives</u>: To reorganise efficiently the water sector, to develop the national water industry, To build a system to develop water services in rural areas, to implement total cost recovery</p> <p><u>Causal Hypothesis</u>: If we create a new scale for water services, then we will gain scale economy</p> <p>If we develop unique operator within an area, then we will gain scope economies</p> <p>If we assign a unique tariff within the ATO, then we will create rural/urban solidarity</p> <p>(If we implement slowly enough the reform, we will permit the Italian water operator to be ready for liberalisation of the sector)</p> <p><u>Instruments</u>: ATO organisation, <i>Salvaguardia</i> clause, concession</p> <p><u>Target groups</u>: Communes, operators</p>	Ministry of Public Works Regions Provinces Communes Committee of vigilance ANPA ARPA
3 b 1994 – 2003 Water resource protection	<p><u>Objectives</u>: To protect the water resource and to transcribe the EU directives</p> <p><u>Causal Hypothesis</u>: if we reinforce the water protection, then we will improve the quality of the environment</p> <p><u>Instruments</u>: Regional plans, authorisation, public budget, codes of good practices, voluntary programs for reducing pollution</p> <p><u>Target groups</u>: Communes, industries, operators, farmers (nitrate)</p>	Ministry of Environment Ministry of Health Regions Water basin authorities ANPA ARPA

6.3. SYNCHRONIC ANALYSIS OF THE LEGISLATION (POLICY ANALYSIS)

6.3.1. Resource Access

6.3.1.1. Property Rights on the Water Resource

Legislation in force

R.D. n.1775/1933: organic revision of the law L. n.2248/1865 defining a regime to authorise water use

Civil code of 1942

L. n.36/1994: Galli Law

Before the Galli law in 1994, the public property of water resources needed to be explicitly declared by the public authority. The waters can be either public or private; and it was difficult to make a clear distinction between the two status mainly because of the overlapping and incoherent array of the Italian legislation. It depended on its potential “public interest” and Courts decided in the last resort. The Galli Law has clearly stated that all the waters, surface water and groundwater, even not abstracted, are public. This means that all water uses need to be licensed.

As noted by EUWARENESS (2002), stating the public ownership of waters does not mean that they are not a commodity. In Italy, the most relevant notion when we consider WSS is the use right, allowing individuals to exploit resources.

The competent authorities to authorise for water use were originally the peripheral administrations of the Ministry of Public Works. From the 70's, with their creation the Regions acquired different competencies on many issues including a part of water policy. They have newly gained full competence concerning the whole water abstraction licensing. Moreover, water balance issues concerning more than two Regions are dealt with the Water Basin Authorities.



6.3.1.2. Public Policies on the Resource

Legislation in force

R.D. n.1775/1933: organic revision of the law L. n.2248/1865 defining a regime to authorise water use

L. n.129/1963: design of the General Regulatory Plan of Aqueducts

L. n.319/1976: protection of water from pollution, focusing on wastewater and on the planning of water uses and protection

L. n.183/1989: structured water policy within a disciplinary action aimed at soil protection. The river basin is the optimal area of intervention. This law covers water quality issues and addresses water and environmental protection

L. n.36/1994: Galli Law

D.L. n.152/1999: integration of environmental, health, economic and productive policies in the perspective of a global policy of water resources management

Objectives:

The objectives of Italian policy on the water resources are naturally based on quantity and quality:

- to preserve the quality of the resource and to respect the quality requirements according to use destinations;
- Water balance between demand and supply.

Instruments:

In order to reach the different fixed objectives, several instruments have been set. Concerning the water withdrawals, all water uses need to be licensed (70 years maximum). There exist abstraction fees but they are very modest. In fact, the control of abstractions is very weak. Water services are charged on a cost-recovery base but this principle is not yet well applied and concerning agriculture and large water transfers, this principle is not respected. Water transfer infrastructure is almost totally financed by the State.

All discharges into watercourses and into public sewers need to be licensed. There exists a code of good agricultural practice obligatory in vulnerable areas (e.g. disposal of livestock waste, use of fertilisers). A number of areas are protected (parks, natural reserves). Moreover,

in order to take into account the impact of pollution of the water resource on the quality of drinking water, charges for the use of sewerage systems are set on a cost-recovery base.

To sum up and as noted by Massarutto (1999), the only environmental taxation used in the sector is represented by abstraction fees that are due in exchange for the license, and that are very low. Besides, water fees policies have not been able to support investments in the water sector. On the other hand, subsidies are more frequently used by way of public budget. The regulatory instruments are devoted to the Regions but they are often limited to the restriction of authorisations.

Target groups:

All water users (e.g. operators of WSS, farmers, industries, communes) are concerned by the policies on resources but not on the same level. For instance, the abstraction fees for agricultural uses (in particular for irrigation) are almost nil and have not adjusted to the increased social cost.

Actors of implementation:

The Regions are the actors of implementation since they collect the taxes, give the authorisation of withdrawal and discharge in regional scale water basin, but also makes the design of regional plan that creates regional standards for authorisation. At the national level, ANPA defines national standards in the environment field (water, air and soil) and ARPA: controls the wastewater discharges at the regional scale. Moreover, national and inter-regional water basin authorities are also concerned when it is a question of supra-regional basin.

Rationale (overall approach):

For policy decision-makers, if waters are protected from pollution, the potential quality of water available for water supply is improved. Hence, the quality of water body is improved, and so the environment is protected from pollution. If the regional standards are fixed and connected to the local natural self-depurating capacity, the natural capacity will be used and a good quality of water body will be reached with fewer efforts than a national rule.

If the impact of activities on water are controlled, as well as on soil and air, the influence on water quality will be limited, either directly (water control) or indirectly (soil and air control).

If the abstracted quantity of water is controlled, one will be able to preserve a minimum of water available for ecosystems and the other users. Hence the power of dilution of the surface water (/discharge of water) will be preserved.

Effects:

Few data or old data are available so it is quite difficult to appreciate the outputs and the outcomes of the policies on water resources. However, we could underline that even though there are taxes for withdrawal of water, they are not connected with an eco-tax system.

6.3.2. Water Production (see also distribution)

Legislation in force

R.D. n.1775/1933: organic revision of the law L. n.2248/1865 defining a regime to authorise water use

Civil code of 1942

L. n.36/1994: Galli Law

Objectives:

It is difficult to distinguish between the objectives at the production level and those at the distribution level. Obviously, the water policy aims to provide good quality of water supply and quantity enough to guarantee continuity of service.

Instruments:

- National level of service;
- standards (from drinking water directives);
- national reorganisation (Galli law);
- contract between AATO and operators with sanctions in case of failure.

Target Groups:

Unique water operator

Actors of Implementation:

The objectives of production are controlled by the AATO. If the AATO's administration is developed enough, sanitary services control the drinking water.

Rationale (overall approach):

If we set a good quality of tap water, we will improve the health. If we create the conditions for an efficient management of water services, then we will improve the quality of service, i.e. continuity, quality of water supply...

Effects:

As the reform is not completely implemented yet, it is hard to measure the effects (outputs or outcomes) of the policy.

We can however underline a few limits. In some regions (Sicilia, Calabria for example) there are regional-scale public operators supplying other operators with bulk water. These operators are not regulated and can fix price at their convenience (in the sense that this is a political decision). This is a limit to the implementation of the integrated service.

6.3.3. Water Distribution (also for production, sewerage and treatment)

Legislation in force

L. n.36/1994: Galli Law

Objectives:

Following the introduction of the 1994 Galli Law to rationalise the Italian water industry from a state of extreme fragmentation in order to reach economic efficiency, the Regions have taken on responsibility for restructuring and regulation.

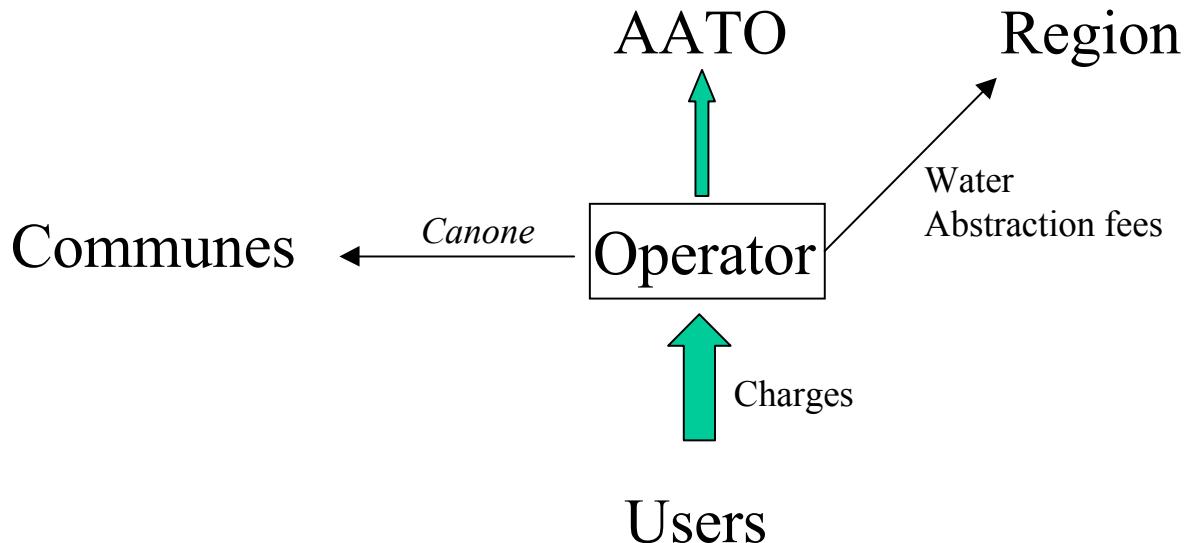
One of important objectives was to implement total cost recovery and to maintain regulated tariff. Another goal is to reach a greater territory equity at a local level.

Instruments:

- Creation of a new water management scale, called *Ambiti Territoriali Ottimali* (Optimal territorial area) – ATO, in order to exploit scale economies. There are 91 forecasted ATOs.
- Integration of the whole water service (*Servizio idrico integrato* – SII) in one unique management organisation within the ATO.
- Creation of a national institution, *Comitato per la Vigilanza sull'uso delle Risorse Idriche* (COVIRI) (committee for the vigilance on the use of water resource) to monitor the implementation of the Galli law, to control the tariff, to observe the performances of the operators.
- Normalisation of tariff at the national level (with a well-defined formula) with an incentive mechanism (price-cap).
- Distinction between the local Authorities and the WSS operator.
- Rules for attribution of water services to operators.
- Unique tariff within the ATO.
- Incentives from the EU: only areas that implemented the reform can obtain EU funds for development of WSS.
- Incentives from the national rules: the operator has to pay a fee to the communes for using the network and investments already done (*canone*). The amount of the fee depends on local application of the rule but is a strong incentive to join the SII. This measure is however less effective when the communes are already in a *consorzio* (intercommunal structure). Figure 3-1 represents the financial flows at the local level.

- *Salvaguardia* clause (safeguard principle) to keep the current operator if he manages efficiently the water service for a transitory time (allowed to adapt the Italian operator to the new national conditions and preserve the national water services industry).

Figure 6-3: Financial flows at the local level



Target Groups:

The whole sector.

Actors of Implementation:

For this reform process, the general management and control tasks has been performed by Central Government, whilst the Regions and the Local Authorities (Provinces and Communes) remain responsible for defining and adopting the most suitable solutions and organisation models for their individual (and often very different) territorial situations.

From the central Government, a national decree defines the level of service and the tariff is set (to be modified every 5 years).

The Regions are now responsible for:

- delimiting and designing the optimum territorial areas (ATO) on the basis of which the water services will be reorganised;
- defining the forms and methods of cooperation between the local authorities within the ATOs (intercommunal cooperation);
- defining the rules (adopting a standard agreement and the corresponding conditions) on the basis of which the local authorities in the ATO will entrust the management and the integrated water service to public or private bodies;
- Defining the type of contract with the operator. In some cases, they can create regional structures for regional scale benchmarking, technical support...
- updating the planning and programming instruments concerning water resources (general regulatory plan for the aqueducts and water remediation plans) and issuing directives for the preparation of the investment plans for ATOs.

In some cases, the provinces may organise the coordination between the communes to create and run the ATO. The Committee of vigilance controls the price setting, proposes for a definition of rules for price setting.

Rationale (overall approach):

If 8000 small units for water service management are replaced by 91 units with a cycle-integrated service, scale economies will be exploited and the services will be more efficient.

If the manager of service (and controller) and the operator are distinguished, the investments should be paid by the operator and then by the users, implementing cost recovery.

As a summary, Figure 3-2 shows the implementation of the Galli law. Moreover, a map of the 91 forecasted ATOs is presented in Figure 6-4.



Figure 6-4: Process of implementation of the Galli law

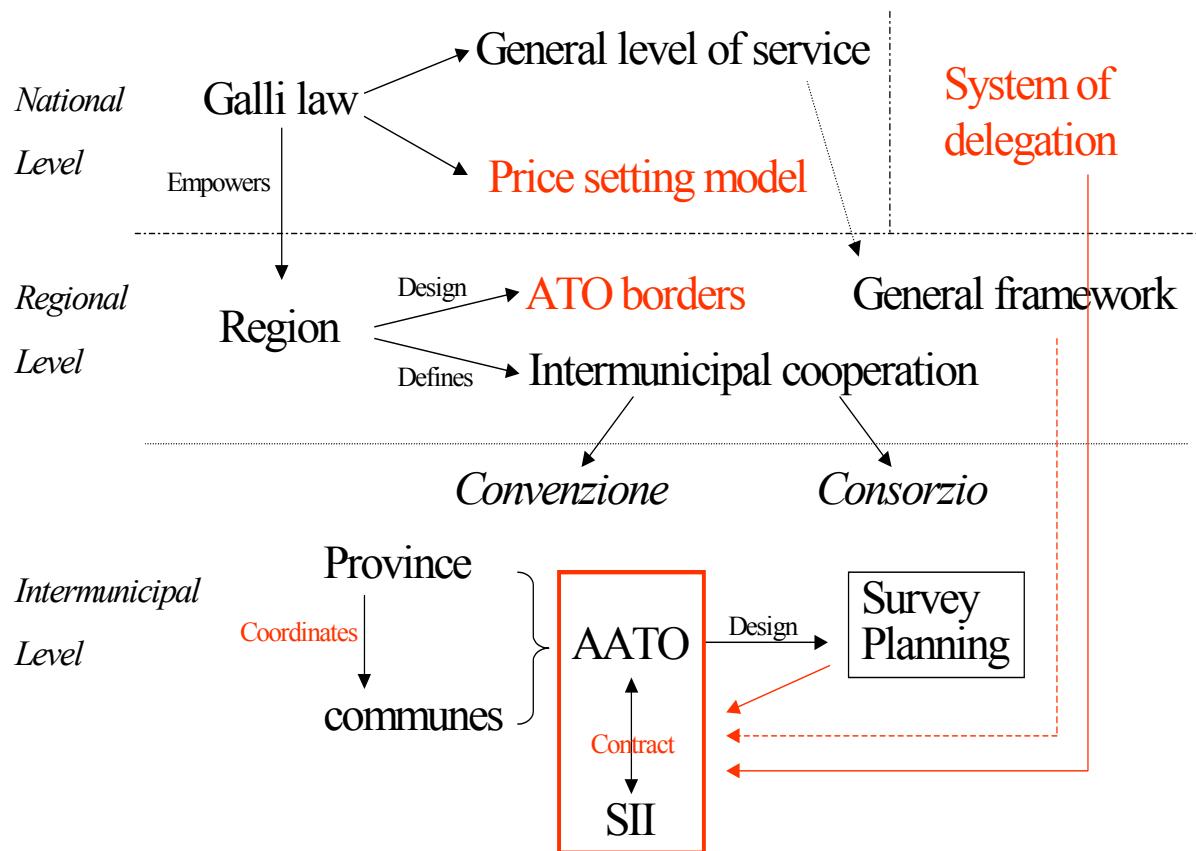
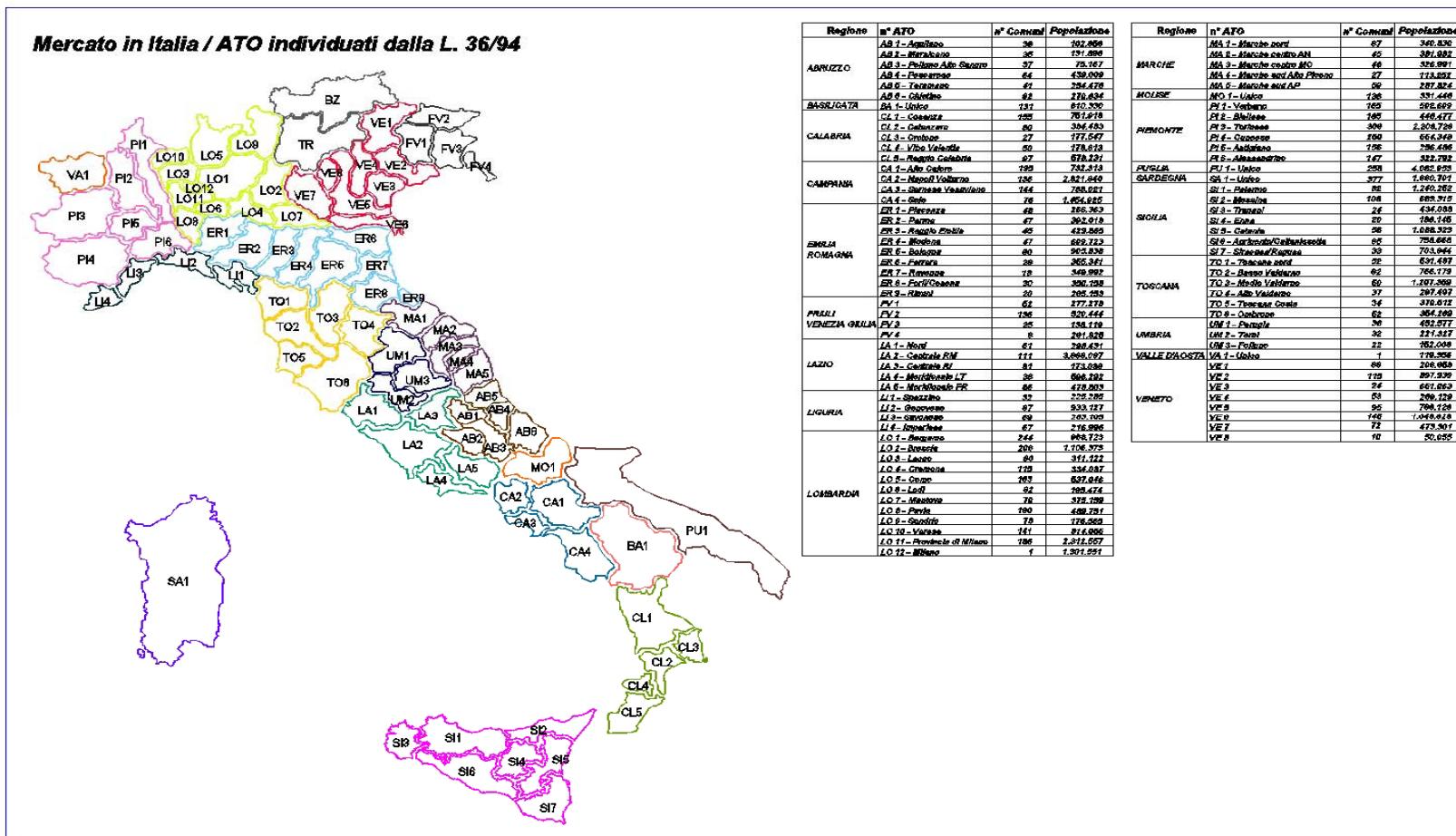




Figure 6-5: The 91 forecasted ATOs



SOURCE: ITALIAN MANGANO (2003).

Effects:

The series of rules and regulations has been defined at the national level for a standard method for determining tariffs. These are indispensable for the application of the Galli law, since all the investment and the costs of service provision have to be covered by revenue generation from the tariffs themselves. The legislation does not provide for any funding from the central taxation system.

By the end of 2002, only 25 ATO reached the final step of assignation of the service. The reform has been implemented very slowly, due to the linear process that involve many different administrative levels (regions, provinces, communes) with potential resistance at each level. Furthermore the process of survey of the situation and planning the *Piano di Ambito* was quite long. But the process is currently implemented (data for 2000 and 2001). One condition of the success of the reform would be the capacity of the ATOs to be able to control the operator and to apply sanction.

One of the limits is linked with the planning of investments. Increases of price allowed by the *Metodo Normalizzato* are not sufficient to cover all investments needed. Moreover, knowledge base about water infrastructure is scarce, so investments have been planned on an incomplete information basis. The surveys are no good bases either. They were realised too quickly, without money (the AATOs have not any before the assignment of the service to the operator). Thus many investment plans are being revised. Moreover the new bids are less competitive (less participants) because the bases of the contract are not sure (some are deserted – for example ATO Sarnese Vesuviano in Campagna).

The way the law is implemented can also lead to reduce the outcomes of the reform. In the objectives of the law, the distinction between the local regulator and the local operator could lead to a total cost recovery and maintain a sustainable level of investments. But in facts, many ATOs delegated their services to communes-owned companies and the communes are both shareholder and controller of the service and may transfer money between the water service and the general budget.

One expected outcome of the reform is to develop the water and wastewater services in the rural areas around the urban areas thanks to the unique tariff.

As far as the national industry is concerned, the slow implementation (and most complicated) of the reform and the *salvaguardia* principle permitted efficiently to preserve the national industry (ACEA, AMGA...) from French and English operators.

6.3.4. Sewerage

Objectives:

Italy is far from respecting the European standards concerning the sanitation system and more generally the environment. For several Regions that benefit from financial support from national authorities, the first objective is to make an inventory of the build network before identifying any restoration needs. Concerning the wastewater management, there are large differences between the Regions and their intentions to invest in the sector. Sanitation is recently become a priority for the Italian authorities. The Law 338/2000 financed the so called “*Piani stralcio*”, which were intended to bridge the gap between the standards imposed by European Directives and the state of sewerage infrastructures. Total investments amount at 14.885m euros, see COVIRI’s *Relazione al Parlamento sullo stato dei servizi idrici, anno 2001*, p. 66).

Instruments:

The first instrument implying a change in the sector is legislative. The measures concerning the water pollution are in the legislative Decree (D.L. n.152/1999) which integrates the European Directives dating back to 1991. There exist some obligations for local communities. According to this Decree, sewerage networks have to be installed:

- before 2000/12/31 for the communes with more than 15,000 inhabitants;
- before 2005/12/31 for the communes from 2,000 to 15,000 inhabitants;
- immediately for the communes with more than 10,000 inhabitants and located in sensitive areas.

There are different subsidies for the building of infrastructures. Italian State and European funds considerably contribute to the financing, in particular in the sensitive areas.

Target Groups:

Essentially the ATO operator and the authorities responsible for the sanitation management.

Actors of Implementation:

The municipalities and the AATOs are in charge of the implementation at the local level of the Decree on the sanitation domain. In a more global environment, the Regions participate to this action by way of controls.

Rationale (overall approach):

If the sewage networks are developed, then we shall be able to guarantee a better management of wastewater and hence the water resources will be of better quality as well as the drinking water.

Effects:

In order to implement the European Directives and to achieve the objectives of standards, the local decision-makers are in search of sources of public financing. Nevertheless, the situation is worrying in certain cases. Some local authorities are very concerned for the lack of financial means and call for a complete Galli Law implementation, which would allow them to increase water tariffs.

The Italian situation presents many disparities between the North and the South. The population connected to the sewerage network is 86% (77% in the Southern Italy) and even if only 2.3% of the municipalities have not sewerage infrastructures, the network is often limited to the centre of communes. Moreover, these networks are very old and poorly maintained, in particular in the South.



6.3.5. Treatment

Legislation in force

L. n.319/1976: protection of water from pollution, focusing on wastewater and on the planning of water uses and protection

L. n.183/1989: structured water policy within a disciplinary action aimed at soil protection. The river basin is the optimal area of intervention. This law covers water quality issues and addresses water and environmental protection

L. n.36/1994: Galli Law

D.L. n.152/1999: integration of environmental, health, economic and productive policies in the perspective of a global policy of water resources management

Objectives:

Aiming at preserving the quality of water bodies and respecting European legislation, Italy has to invest in wastewater treatment. On the whole Italian territory, there are 9800 sewage plants but 13% among them are out of service. The dimensions of the plants are not adapted to treat the wastewater implying very high costs and resulting in low efficiency rate. Unfortunately, the investments in the sector are blocked by too low prices that do not allow important financial contributions

Instruments:

Control of the unique water operator activities as any other industrial operator.

According to the legislative Decree (D.L. n. 152/1999) which integrates the European Directives dating back from 1991, urban wastewater must be treated:

- before 2000/12/31 for the communes with more than 15,000 equivalent inhabitants;
- before 2005/12/31 for the communes from 10,000 to 15,000 equivalent inhabitants;
- before 2005/12/31 for the discharges in fresh waters for the communes from 2,000 to 10,000 equivalent inhabitants.

Target Groups: The operators.

Actors of Implementation:

- ANPA;
- The control of discharges is carried out by the Regions (regional plans) and the local authorities entitled to the power of administrative police (ARPA - regional agency for environment).

Rationale (overall approach):

If the discharge quality is controlled, the environment is preserved as well as the potential of water as drinking water.

Effects:

As the ARPA are funds by the region, the level of implementation of the control depends on the political willingness of the region. Anyway the environmental controls seem to be quite few in general.

6.3.6. *Synthesis*

6.3.6.1. Table for the Comparison



Table 6-2: Synthesis - Italy

Water cycle	Public policy	Objectives	Instruments	Target groups	Actors of implementation	Effects	
						Outputs	Outcomes
1. Resource access	- To preserve the quality of the resource - To respect the quality requirements according to use destinations - To guarantee the water availability	<i>Pr.</i> <i>Inc.</i>	Licenses for withdrawals and discharges Regional Planning Protected areas Technical standards (very modest) abstraction fees Public subsidies	- Different users (agriculture, industries, WSS operators)	- ANPA - ARPA - Regions - Basin Authorities	Low	Low
2. Production	- To guarantee a sufficient production (sufficient level of investment) at a good quality	<i>Pr.</i> <i>Inc.</i>	National level of service Full cost recovery though ATO system Contract between operator and AATO Public subsidies	- WSS operators	- Regions - AATOs	Medium	Medium
3. Distribution	- To rationalise the water sector in order to reach economic efficiency - To implement total cost recovery - To maintain regulated tariff - (To create a national industry – in the implementation) - To reach a greater territory equity at the local level	<i>Pr.</i> <i>ATO</i> <i>Inc</i> <i>(Canone)</i> <i>Inf.</i>	Quality standards Full cost recovery though ATO system Control of price by the national committee (tariff normalisation) Unique operator and unique tariff within the ATO Missions of public service Fee for use of commune infrastructures Public subsidies Benchmarking	- WSS operators - Municipalities	- Ministry of the Environment - Committee of vigilance - Regions - Provinces	High	High
4. Sewerage	- To apply the European legislation in the sanitation sector	<i>Pr.</i> <i>Inc.</i> <i>Inf.</i>	License of discharges Water quality plans (State and European) funds Legislative decrees Code of good agricultural practices Voluntary programs for reducing pesticides and fertilisers	- WSS operators - Authorities responsible for the sanitation management	- Regions - AATOs - Municipalities	Medium	Low
5. Treatment	- To protect the resource	<i>Pr.</i> <i>Inc.</i>	Licences for all discharges Control of the discharge Obligation to equip all areas Standards European funds and public budget	- WSS operators	- ANPA - ARPA - Regions	Medium	Low

6.3.6.2. National Model? Main Characteristics

The Italian model of management of WSS services is not yet stabilised because the process of rationalisation of the water industry involved by the Galli law in 1994 is still in progress. The Italian water management system was characterised by an extreme fragmentation of services, an important disintegration of activities related to water services, a very weak development of the water industry and inefficient regulation tools. The Galli law aimed at remedying to this situation. The most important developments contained in the reform of 1994 can be summarised by these different features:

- vertical integration of services on the whole water cycle,
- grouping together the water services at the intermunicipal level (new territorial areas with the creation of ATOs),
- a single operator in charge of the (integrated) WSS service (the SII),
- a national regulator (Committee of vigilance but with few powers) and a local regulator (Authority of ATOs)
- adoption of the full cost-recovery principle.

The local regulator (AATO) is in charge of the organisation of the service, the plans of investments and controls the operator. This will be possible only if the AATO disposes on enough financial and human resources. Currently, the phase of implementation shows some weaknesses but they should be temporary.

The WSS operator is another strong characteristic of this organisation. The operator is unique and at the end of the implementation it should not have more than 91 operators (some operating many ATOs).

Hence, the main relationship in this organisation is the contract between the local regulator and the operator. To this point of view we could compare this organisation with the French model. The differences are however strong: there is a national regulation (by way of the Committee of vigilance) of the price (normalized method for calculation of the price) and the size of the local regulator is bigger in Italy thanks to the Galli reform.

The organisation of the operators is also an interesting characteristics. Due to the rules of delegation to operator, a new type of operator is emerging: private-public mixed owned companies. The following years will reveal if these operators are sustainable.

When the reform will be completely implemented, we should talk of the Italian organisation of the sector as a model.

6.4. FUTURE TRENDS IN WATER PLANNING AND MANAGEMENT

6.4.1. Emerging Legislation

The main concern was the contest from the European Commission against the mode of delegation of water services. A new law (to be approved by the parliament) should build a clear framework for delegation of WSS and could permit the reform to be implemented in the rest of the country.

In the next years, the reform should be completely implemented especially if the legislative framework is stable (it hasn't be the case!). But even if all the ATOs will be totally realised, the complete enforcement of the Galli law will not be easy to realise. In particular as noted by the Committee of Vigilance in this recent report to the Parliament, there exist obvious oppositions from those that fear to lose place and power, and hostilities between the users even if the reform would wish to defend them. Table 4-1 shows the State of law enforcement concerning the setting up of ATOs and the assignation to an operator of the SII.

Table 6-3: State of law enforcement L. n.36/94

	North	Centre	South	Italy
Forecasted ATOs	44	19	28	91
Created Authority of ATO	38	19	27	84
Carried out recognition	22	16	28	66
Approved area plans	6	14	27	47
Carried out assignation	6	14	5	25

Source: Presentation to the Parliament on the state of the water services - Comitato per la vigilanza sull'uso delle risorse idriche - Year 2002.

One other factor of change could be the role of the national regulator (Committee of Vigilance). There are two possibilities:

- It can stay as a simple observatory of the services in order to provide comparison tables, performance indicators, proposals for price regulation and general level of service.
- It can also have a stronger role in the regulation of the system through implementation of yardstick competition and the monitoring of contracts.

However, most of the regulation is in the contract between the operator and the AATO (with some similarities with the French model). If the AATO is strong enough to control strictly the application of the contract, then the local regulation will be efficient and maybe sufficient. But there are many limits to this best-way evolution: each AATO is free to decide the level of control (and actually the level of power it is granted through its budget). (This is typical of a decentralized solution). In some cases, the municipalities that participate to the ATO are also the shareholders of the ATO. This can lead to self-regulation but also to a bad implementation of the cost-recovery principle or a weak control of the application of the contract.

The trend towards the delegation of service to mixed (private and public) operators seems to be inevitable even if currently the choice of direct assignation has been preferred to competitive bids, see Table 6-4 for the recent modalities of assignation of the management of the SII.

The government seems to highly recommend to the local authorities to go into competitive bids even in the case they wish to maintain their own management structures. As noted by Massarutto (2001), this rigid solution would prevent any another management organisation but delegation to a private operator, and even municipal firms would be forced to evolve in this direction.



Table 6-4: Modality of assignation of the management of the integrated water services (SII)

Duration	Competitive bid	Direct assignment		Total	
		Status of the operator			
		Public SpA	Mix SpA		
Transitory period (included Salvaguardia)		<i>Ato Bergamo</i> <i>Ato Milano</i> <i>Ato Centro Ancona</i> <i>Ato Centro Sud Alto Piceno-Maceratese</i> <i>Ato Pescarese</i> <i>Ato Chietino</i>	<i>Ato Astigiano Monferrato</i> <i>Ato Genova</i> <i>Ato Rimini (salvaguardia)</i> <i>Ato Sud Ascoli Piceno</i> <i>Ato Basilicata</i>	11	
Long period	<i>Ato Frosinone</i>	<i>Ato Puglia</i>	<i>Ato Valle del Chiampo</i> <i>Ato Basso Valdarno</i> <i>Ato Medio Valdarno</i> <i>Ato Alto Valdarno</i> <i>Ato Toscana Costa</i> <i>Ato Ombrone</i> <i>Ato 1 Umbria,</i> <i>Ato 2 Umbria</i> <i>Ato 3 Umbria</i> <i>Ato 2 Roma</i> <i>Ato 4 Latina</i> <i>Ato Sarnese Vesuviano</i>	4	
Total	1	7	17	25	

Source: Presentation to the Parliament on the state of the water services - Comitato per la vigilanza sull'uso delle risorse idriche - Year 2002.

Concerning water prices, the evolution towards the full cost-recovery is ineluctable because of needs to finance many new infrastructures in order to respect the European legislation and in particular to comply with the Directive 91/271/EEC. However, it is unlikely that all the necessary investments will be financed through water price alone. The financing needs in the WSS sector is estimated to roughly €28 milliards on a period of 12 years in average, with €11.2 milliards for the water supply, €12.2 milliards for the sewerage and €4.6 milliards for the treatment of wastewater. This is why the public (European and State) subsidies will continue to be necessary as well as alternative sources of financing.

6.4.2. Overall Trends

In Italy, the sector of utilities is crossing a period of deep change and modernisation. The sector of electricity as well as natural gas were recently opened to private sector while



supporting the entry of new operators in the market, the rationalisation of supply and a general fall of the prices. The sector of telecommunications is already in a advanced phase of the process of liberalisation, concerning the fixed network but also for mobile telecommunication. On the other hand, with regard to the water management, the situation is not yet well defined, considering the fragmented character of its network and the pulverisation of the current operators.

There is no real model of liberalisation but rather progressive liberalisation in these sectors. National enterprises are progressively privatised with the setting up of a national regulation authority. Specifically, in the energy sector, there is an opening of the capital to private partnership. Moreover, following the example of gas market, Italy has chosen to go further in the liberalisation in particular by juridically separating the grid system along with imposing a limited access and by opening their final market completely (with a possible exception for the domestic market). The reforms of the regulation in network industries were effective and although the companies in place preserve a dominant position, competition starts to play. In particular, the liberalisation of telecommunications is considered as a success.

As said above, most of the ATOs has delegated without bid (direct assignation, sometimes with private participation) and the public participation is still important but the new legal form of joint-stock company is more and more adopted. Nevertheless some conditions are present to a progressive liberalisation of the sector, through bids or through the selling of public participation (in case of needs of fast financing). According to OECD, the measures intended to ensure a durable development must more largely use the forces of the market. In the water sector, the pollutant emissions of urban wastewater remain alarming. The investments were slowed down by the policies of price fixing determining water charges much lower than those perceived in other countries of OCDE. Hence, it is well recognised by the authorities that the process for a new water management has to continue and that the full cost recovery principle has to be applied.

6.5. CONCLUSION

Italian water legislation has been greatly influenced by European directives, see EUROMARKET (2003): Indeed, the EU directives have enhanced technological change and there has been a financial pressure on municipalities. Moreover, the Italian water sector is characterised by an important effort to rationalise its industry in order to reach economic efficiency. Hence, there has been an important reform (still in progress) of the sector in the beginning of the 1990s. The Italian water sector is undergoing a process of transformation from the traditional public and municipal management arrangements towards a new territorial responsibility and management alternatives that entail the private sector participation.

The Galli law dating back to 1994 aims at reforming the water sector by concentrating the structures in order to exploit scale, scope and vertical-integration economies: vertical integration of the whole water cycle, responsibility of the management to a new territorial (intermunicipal) area (ATO), a single operator to operate the SII. Another principle is to define a tariff system based on the same price for each ATO. The price must cover all the costs concerning the water supply and sanitation services, with the objective to ensure the economic balance of the water management with the recovery of all investment and operation expenses, and so by recognising the industrial character of the water services.

It is quite difficult to assess the reform at this stage because many changes have still to be realised (the setting up of some ATOs and the assignation of WSS management). However the water issues in Italy are numerous in particular concerning the environmental risks. The important losses and the situation in several zones (e.g. salt intrusion, non existence of sewerage networks and/or wastewater treatment plants - Milan as an example) pose problems regarding the public health and the different economic costs in the short and long term. This situation is now well known by all stakeholders, and this encourages the political decision-makers to pursue the reform of water management.

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7. CHAPTER 7: COUNTRY REPORT PORTUGAL

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ACRONYMS

AdP	<i>Aguas de Portugal</i> , National Public Holding for WSS services
APDA	<i>Associação Portuguesa de Distribuição e Drenagem de Águas</i> , Portuguese Association of Water Suppliers
DRARN	Regional Directorates of the Ministry of Environment
EM	<i>Empresa Municipal</i> , Municipal Enterprise
EPAL	<i>Empresa Portuguesa de Aguas Livres</i> , Water Operator of Lisbon
EU	European Union
IA	<i>Instituto do Ambiente</i> , Environment Institute
ICN	<i>Instituto da Conservação da Natureza</i> , Institute for natural conservation
INAG	<i>Instituto da Água</i> , Water Institute
IR	<i>Instituto dos Resíduos</i> , Solid Waste Institute
IRAR	<i>Instituto Regulador Aguas e Resíduos</i> , Regulation Institute for Water, Sanitation and Solid Waste
IWRM	Integrated Water Resources Management
MAOT	<i>Ministério do Ambiente e do Ordenamento</i> , Ministry of Environment
PEAASAR	<i>Plano Estratégico de Abastecimento de Águas e de Saneamento de Águas Residuais</i> (2000-2006), Strategic Plan for Water Supply and Sanitation
PSP	Private Sector Participation
SMAS	<i>Serviços Municipalizados Águas e Saneamento</i> , Municipal Service for WSS
WSS	Water Supply and Sanitation

¹²⁹ Laboratory GEA, ENGREF. The authors are very grateful to Patricia Manso (EPFL-MIR) for the re-reading of the document and useful comments on a previous draft.



7.1. INTRODUCTION

Portugal is a small European country of 89,300 sq. km facing Atlantic Ocean and close to North Africa. Its climate is under both Atlantic and Mediterranean influences: the northern coastal region and the north-eastern region have a cool and rainy climate, whereas the southern region, highly influenced by the Mediterranean sea and by African winds, has a warmer and dry climate.

Figure 7-1: Map of Portugal



There is a sharp contrast in Portugal between urban coastal areas, where most of the population and industry is concentrated, and in-land mountainous areas that remain relatively low densely populated and less industrially developed.

One of the specificities of Portugal among other European countries is its low development regarding water supply and sanitation services (WSS services hereafter): although there have been huge improvements in the past ten years, the sanitation coverage is still one of the lowest of Europe. Hence, the legislation is still focusing on increasing the rate of coverage, and a certain emphasis on water quality mainly due to the transposition of European legislation. A recent and still on-going reform (launched in 1993) proposed a new model of water management. Today, two different systems coexist, depending on their degree of reform.

7.2. GENERAL FRAMEWORK FOR WATER MANAGEMENT

7.2.1. *Institutional Framework*

There are about 300 municipalities in Portugal, while the total population amounts to 10 millions inhabitants. The repartition of competencies between the central power and local municipalities has been subject to tensions during the 20th century, with a huge centralization during the Salazar dictatorship. Today, although the Revolution in 1974 restored most of the prerogatives of municipalities, there has been a "re-centralisation" of WSS services in 1993. In the new model proposed by the 1993 reform, most competencies concerning water resources management, drinking water production and wastewater treatment belong to national and regional administrative levels, namely the Ministry of Environment and Ministry of Economics, whereas the municipalities are only in charge of local distribution of drinking water and collection of wastewater.

The Ministry of Environment (its name has often changed, including - or not - Natural Resources, Territory Planning...) is in charge of water resources management. It controls directly four National Institutes (namely, for natural conservation, solid waste, water and environment) and five regional directorates. These regional directorates are polyvalent and deliver licenses (for water abstraction, for instance). In addition, economic regulation for

water, wastewater and solid waste sectors is made by a national institute, IRAR (*Instituto Regulador Aguas e Resíduos*), financially independent from the Ministry of Environment.

WSS services are numerous and small in Portugal: more than 90% of the systems supply less than 5,000 inhabitants - on the whole only 20% of the population (MAOT, 2000). There is a diverse set of organisational arrangements for WSS services: the municipalities used to be fully responsible of WSS services, from drinking water production to wastewater treatment. Most of the municipalities still operate themselves their WSS services. However, since 1993, about half of the population of the country is following a new model where the responsibilities for WSS services are shared between three levels:

- at the local level: the municipalities are still responsible for water distribution and wastewater collection (considered as "low pressure" activities, "*baixa*" in Portuguese);
- at the regional level: several multi-municipal systems have been created in the urban areas. They are public companies that are in charge of "high pressure" activities ("*alta*" in Portuguese), i.e. water production and wastewater treatment.
- at the national level: a State owned holding company (*Águas de Portugal*, AdP), created at the end of 1993, is the major shareholder of the multi-municipal companies, and channels European funds.

This model is supposed to be extended over the whole country.

7.2.2. Resource Status and Resource Use

Water withdrawals amount to about 8,750 millions of cubic meters per year (MAOT, 2001, see National Water Plan). The average water resource available in Portugal is significant (potentially more than 6,000 m³ per capita per year) but the variability in space and time leads to scarcity problems in the southern regions (Algarve in particular). However, Portugal has only small water transfers mainly for hydropower production and for water supply purpose. Regarding water quality, there is an increasing pressure on water resources in touristic coastal areas, as for instance in Algarve.

The dependency of water from Spain is also a major preoccupation. The five Portuguese-Spanish rivers (Douro, Minho, Lima, Tejo and Guadiana) represent about one quarter of total usable water resources in Portugal. A "Convention on Cooperation for Portuguese-Spanish River Basins Protection and Sustainable Use" defines the framework for bilateral cooperation for freshwater and groundwater protection.

The resources for domestic use come from groundwater (40%) and surface water (60%). WSS services use only 7% of the total water uses; the most important user is agriculture with around 77%. The industry sector uses only 16% of the total water uses (Eurowater, 1995). These figures vary greatly across regions, with different patterns of consumption depending of the level of development of industry

7.2.3. General Description of the History of Water Laws

From the beginning of the XXth century and until 2003, we can broadly identify three main phases in the history of Water Laws, with the most important pieces of law being quite recent.

7.2.3.1. 1900-1974: priority to resource access for hydraulic schemes

In the first half of the century (until 1974), water policies focus on hydraulic schemes for hydropower and agriculture. The main pieces of legislation deal with the definition of public domain and the rules to access it. For instance, the concept of water domain is introduced in 1892: it includes not only the water body but also a strip of land around it. The first Water Law in Portugal (still partially in force) dates back to 1919. This law defines private and public waters, and sets the rules and instruments to access public waters (mainly through licenses and concessions). In 1966, a new Civil code is approved: it considers groundwater as private but subject to regulation on the use, while most surface waters remain considered as public.

Most of the Decree-laws during that period concern hydraulics scheme (dams in particular) to develop irrigation or electricity production. During this period, WSS services are not subject to any national or locally co-ordinated policy. Municipalities manage WSS services, but do have neither finance nor power for the design of schemes. Both private and public operators deal with WSS services in the most important cities (Lisbon and Porto), with public fountains

managed by the municipality and private connections managed by private operators. In the rest of the country, WSS services remain poorly developed, or even not at all.

7.2.3.2. 1975-1992: Reinforcement of the municipalities power and limitation on resource access

The Revolution of 1974 initiates a new phase of development that will last until 1992. This period is characterised by two simultaneous (but non coordinated) policies: at the local level, there is a reinforcement of the municipalities power, with a modernisation and extension of networks; at the national level, first environmental concerns appear.

After the dictatorship, the municipalities become fully responsible for the water supply, with a transfer of budget and planning (Law no. 46/77). This leads to a great increase of activities for WSS services, but still with a local and short-term perspective. Private operators are nationalised (e.g., the company of water in Lisbon) and, according to the "Delimitation Sector Law", can not operate WSS services anymore.

The legislation concerning water abstraction is reinforced in 1977 (Decree-law no. 376/77): abstraction from private groundwater is now subject to licensing for the sensible aquifers (western border, Algarve). In 1987, the framework law for the Environment (Law no. 11/87) initiates the very first development of environmental concerns. In 1990 (Decree-Law no. 70/90 and Decree-Law no. 74/90), an attempt is made to create a framework for an integrated water resources management, with the creation of a Ministry of Environment, the transposition in the national legislation of most of the EU directives concerning water quality. In 1991 (Decree-Law no. 109/91), the industrial sector is subject to more stringent regulation for discharge of effluents. The purpose of these laws is to protect the quality of water. Thus, there is a progressive change in the rationale of public policies concerning water quality, with a focus on prevention of pollution.



7.2.3.3. 1993-2003: Entrepreneurial approach of WSS services with a national perspective

From 1993, WSS services and water quality become national priorities. Indeed, although there have been improvements since 1974, the situation in 1990 for WSS services was still bad¹³⁰: only 80% of the population is supplied in drinking water (but the situation is very heterogeneous and the quality is poor); and only 55% of the population is supplied with a sewerage system but only 21% of collected wastewater is treated. As a consequence, major changes are introduced in 1993 in the sector, with a new rationale: in order to improve the quality of service (more inhabitants connected, with a better water quality), it is necessary to reorganise the sector and concentrate skills within new multi-municipal entrepreneurial companies. Thus, this last period, where we distinguish two phases, is characterised by:

- the separation of "*alta*" activities (water production and wastewater treatment) and "*baixa*" activities (water distribution and sewerage), with the intention of re-centralising of *alta* activities; Although initially multi-municipal systems were identified as bulk-supply systems, they can also refer to retail systems.
- a new entrepreneurial approach.

7.2.3.4. 1993-1999: creation of the first multi-municipal companies in the most problematic areas

During the first phase (1993-1999), a new model for WSS services is implemented, characterised by the creation of multi-municipal companies that deal with *alta* activities (water production and wastewater treatment), and the opening of *baixa* activities (water distribution and sewerage collection) to private sector participation (Decree-Law no. 379/93).

Multi-municipal companies have a concession contract for 25-30 years with the State (Decree-Law no. 314/94). They provide the municipalities with treated bulk water and/or treat the collected wastewater. The municipalities are still responsible for the distribution of the drinking water to the final users and for the collection of wastewater. AdP (*Águas de Portugal*) a national public-owned holding, but with an entrepreneurial management, is

¹³⁰ Data from OCDE, 2001

created by the same Decree-Law (Decree-Law no. 379/93). The major part of the EU structural funds are to be channelled through this holding. AdP owns at least 51% of shares of the multi-municipal companies, the rest being shared between the municipalities (it does not exist in practice but by law the private sector may have a minority stake in these multi-municipal enterprises).

This model based on multi-municipal companies was firstly created in the sensitive coastal areas, where most of the population is concentrated. The Decree-Law no. 314/94 also creates a new model of concession for the municipalities with private operators. In addition, in order to regulate private sector participation, a national authority of regulation in the water sector is created (IRAR, *Instituto Regulador Aguas e Resíduos*) in 1997, but it starts working only in 1999.

7.2.3.5. 1999-2003: extension of the multi-municipal companies in remote areas

Since 1999, this model is extended to the whole country, in a more difficult context (lowest density of population, less European subsidies). There is also an important trend towards inter-municipal systems, i.e. municipal systems managed by an association of municipalities.

Besides, the second phase is characterised by the development of the public holding AdP: AdP starts entering in competition with private operators and bidding for concession through its subsidiary Aquapor.

In 2000 the Portuguese environment ministry presents a strategic program for water industry in Portugal, known as PEAASAR, for the years 2000-2006. In 2001, the Water National Plan (WNP) is presented, according the Water Framework Directive. It relies on 15 basin plans established at basin level.

At the end of 2003, the new Water Law was discussed. It should transpose the European Water Framework Directive and introduce Integrated Water Resources Management (IWRM) with basin units. Many major changes in the regulation of the sector have to be decided, with two main points:

- concerning IWRM, the creation of basin authorities would reinforce the regional level;



- concerning WSS services, the government should clarify its position towards private sector participation (PSP) and especially the future of the public holding AdP, as discussed in the last section of this report.

Table 7-1 summarises the different phases of the policy design concerning water policy in Portugal.



Table 7-1: Phases in the Development of the Policy Design concerning Water Policy in Portugal

Phases	Policy design	Actors of implementation
1. 1892 – 1974: WSS services are not subject to national policies , priority on resource access for huge hydraulic schemes		
To define resource access on public and private waters	<p><u>Objectives</u>: To define private and public waters and access rules, to develop national schemes mainly for irrigation and hydropower</p> <p><u>Instruments</u>: hydraulic schemes: dams, transfers.</p> <p><u>Target groups</u>: Private and public operators</p>	Ministry of Hydraulics
2. 1975 - 1992: Reinforcement of the municipalities power (development of WSS services with local perspective) and limitation on resource access		
To develop the WSS services with a local perspective	<p><u>Objectives</u>: To develop the water supply and sanitation services</p> <p><u>Causal Hypothesis</u>: If we develop public management of water supply, then we will improve public health and local development.</p> <p><u>Instruments</u>: No national instruments, but a local perspective : responsibility of the service to the municipalities. Nationalisation of water supply companies.</p> <p><u>Target groups</u>: Municipalities</p>	Municipalities
To improve the prevention of pollution	<p><u>Objectives</u>: To improve the water quality and control groundwater abstraction</p> <p><u>Causal Hypothesis</u>: If we improve the quality of water, we will maintain our production capacity.</p> <p><u>Instruments</u>: License for abstraction and discharge, control of the Min. of Environment</p> <p><u>Target groups</u>: Industries, landowners, farmers</p>	Ministry of Environment, Regional directorates for environment
3. 1993 – 2003: An entrepreneurial approach of WSS services with a national and regional perspective		
Creation of a new framework for WSS services at regional level	<p><u>Objectives</u>: To resolve urgent problems for water quality and sanitation in sensitive and highly concentrated areas; to have a professional sector, both public and private; to make efficient use of European funds.</p> <p><u>Causal Hypothesis</u>: If we develop WSS services at supra municipal level and foster private sector participation, we shall concentrate skills and we shall be able to make quick and efficient use of European funds in order to improve the quality of service.</p> <p><u>Instruments</u>: Creation of multi-municipal companies, laws allowing concession with private sector</p> <p><u>Target groups</u>: Municipalities, private operators</p>	Ministry of Environment, IRAR, AdP, multi-municipal companies
Implementation of European environmental policy	<p><u>Objectives</u>: To improve the water quality</p> <p><u>Causal Hypothesis</u>: If we improve the quality of water, we will preserve our potential drinking water</p> <p><u>Instruments</u>: Tax for withdrawal and discharge, protection perimeters, standards for use and discharge</p> <p><u>Target groups</u>: water users (industry, agriculture), land owners</p>	Ministry of Environment, Regional directorates for environment
Generalisation of the multi-municipal model	<p><u>Objectives</u>: To extend multi-municipal systems over the country; to have a public entrepreneurial sector able to compete abroad</p> <p><u>Causal Hypothesis</u>: If we include low-density areas in multi-municipal systems, we will be able to have a mutualisation of costs.</p> <p><u>Instruments</u>: Creation of new multi-municipal systems in low-density areas</p> <p><u>Target groups</u>: municipalities, private operators</p>	Ministry of Environment

7.2.4. Main Public and Private Actors Involved

In this section, the main actors related to WSS services are briefly presented according to their geographical scope.

7.2.4.1. At the European level: the role of European subsidies

Although the European Union is not a direct actor of water management in Portugal, as in other European countries, it had a significant influence on Portuguese water policy, in particular through the European subsidies. Half of European structural funds are for environment: €1.3 thousand million in the period 1994-2000 and €1.7 thousand million planned for 2001-2006. Thus, European funds represent nearly one third of the total budget of €6 thousand million planned by the government for environment between 2000 and 2006 (out of which €5 thousand million are devoted to water and sanitation).

Table 7-2: Allocation of European funds

<i>in millions of euros</i>	II European Support Framework (1994-2000)	III European Support Framework (2001-2006)
Total European subsidies (Cohesion Funds)	1,300	1,700
European subsidies for WSS services	490	1,300
Total investments by AdP in multi-municipal systems	980	3,500*

*Source: DREE (2003) *The remaining €2,200 Millions are to be provided by price increases and ADP equity.*

7.2.4.2. At the national level: control, regulation and financing of WSS services

The **Ministry of Environment** controls four national institutes:

- **INAG** (*Instituto da Água*) is in charge of the development and application of the national policies in the domain of the water resources and the basic sanitation by way of the National Water Plan and the River Basin Plans.
- **ICN** (*Instituto de Conservação da Natureza*) is the responsible institute for the national activities in the domain of the conservation of the nature and the management of the protecting areas.
- **IA** (*Instituto do Ambiente*) has been created by the Decree no. 8/2002, and results of the fusing of the *Direcção Geral do Ambiente* (DGA) and the *Instituto de Promoção Ambiental* (IPAMB). IA is in charge of study, conception, coordination, planning and normative and technical support in the area of the management surrounding it and the promotion of sustainable development.
- **IR** (*Instituto dos Resíduos*) is responsible for the respect of the execution of the national politics in the domain of the residues and of the enforcement of the technical standards and regulations in vigour.

The ***Instituto Regulador de Águas e Resíduos*** (IRAR) is the regulator for water, sewerage and waste disposal. It is independent from its parent ministry (namely the Ministry of Environment), as it is financed by taxes paid by operators¹³¹. It was created in 1997, but initiated its activities only in 2000, and with some difficulties. The first report of IRAR (2000) describes the general context of the sector and assigns main objectives for regulation: tariffs (economic regulation), concession contracts, quality of services and protection or users interests. At the beginning, the means of IRAR were quite low: about 20 persons and a budget of about €1.2 Millions in 2000. It had no coercive power (on tariffs, for instance) and its power is limited to consultation, recommendations and diffusion of information (as in a model of *sunshine regulation*¹³²). In 2001, the first director of IRAR gave up his functions, because he considered he did not have enough power to assume its missions. IRAR stayed two years without director, until 2003. At the beginning of 2003, there is a new start for IRAR. It

¹³¹ IRAR is autonomous in administrative and financial terms but it is under the tutelage of the Ministry of Environment.

¹³² Sunshine regulation refers to a no-coercive regulation that has an audit power on firms, and can edit public reports on the results reached. It has been implemented in Sweden for the telecom, for instance.

regulates concession contracts between multi-municipal systems and the State (about 15 contracts) and also between municipalities and private operators (about 20 contracts): this means that IRAR issues opinions on tariffs and contracts, and the way competition is implemented when bidding. From 2004, it will also monitor the quality of supplied water. Thus, the role of the regulator will certainly evolve positively in coming years.

Aguas de Portugal (AdP) is the public holding in the large sector of environment (water, sanitation and solid waste). Concerning the water sector, AdP has two important business units : the first one gathers the multi-municipal companies, for which its participation is at least 51%; the second one is a unit that gathers direct concession contracts with the municipalities for water distribution and wastewater collection (it originates in Aquapor, a private company bought by AdP). Table 2-1 below presents the importance of multi-municipal companies created from 1993.

Table 7-3: The development of multi-municipal systems within AdP

	Number of multi-municipal companies	Number of municipalities	Supplied population (thousands of inhabitants)	Production (millions of m ³ per year)
Water Production	8	83	4,500	465
Wastewater treatment	8	35	2,300	118

Source: AdP (2003).

APDA (Portuguese Association of Water Suppliers) is a national association that gathers most of the Portuguese public and private water suppliers: it represents 85% of population for water distribution, and it has a strong lobbying power.

7.2.4.3. At the regional level: operation of "alta" activities by public multi-municipal companies

Five **Regional Directorates for the Environment** (under the control of the Ministry of Environment) deliver licenses for water withdrawals and discharge. They are located in the North, Centre, Algarve, Lisbon and Tagus Valley, and Alentejo Regions. However, their boundaries do not correspond to the water basin ones and water is only one of their competences.

Multi-municipal companies gather several municipalities whose assets are held by AdP and the municipalities. These companies have two different kinds of contracts. On the one hand, they conclude a concession contract with the State for a period of 25 or 30 years – although it is surprising that the State is involved. On the other hand, they have a furnishing contract with each municipality for the supply of bulk treated water or for the treatment of wastewater (price can vary according to the municipality).

EPAL in Lisbon is a particular case. It is 100% owned by AdP and it both supplies bulk treated water to municipalities of Great Lisbon area and supplies directly water to users in Lisbon.

7.2.4.4. At the local level: operation of "baixa" activities by public and private organisations

At the local level, two models coexist, since the 1993 reform has not yet been extended to the whole country:

- **Most of the municipalities** are still fully operating their WSS services¹³³: from water production to wastewater treatment, through a municipal service, or through an inter-municipal system, that remains at a local scale, and is just a grouping of municipalities without AdP as a main shareholder (moreover they are only associations of municipalities and not companies as it is the case of multi-municipal companies).

¹³³ Yet, some municipalities delegate the management of WSS to (private or public) operators.

- **Municipalities that are part of a multi-municipal company** (45% of the population for water and 23% for wastewater treatment) are only responsible for "baixa" activities: water distribution and collection of wastewater. They can either manage it by themselves, or delegate it to a public or private operator.

If the management remains municipal, there are different forms of municipal organisations:

- municipal services (*serviços municipais*) can deal with water and wastewater but are not specialised structures (they also deal with roads, solid waste, school catering, etc.), with no separate budget;
- SMAS (*Serviços Municipalizados Águas e Saneamento*) are structures under the control of the municipality but devoted to water and wastewater (and marginally to solid waste). They have their own budget but not juridical status and the municipality power is very strong (on tariffs and loans, for instance). Financial transfers between the WSS services and the municipality occur frequently (the principle of cost recovery is not implemented at all);
- municipal enterprise (*Empresa municipal*) is a new corporate structure, i.e. organised as a private enterprise but municipally-held. In that case, the management rules are more entrepreneurial and there are less financial transfers between the municipal budget and the WSS services budget.

If the management is delegated, the chosen operator can be public (as for instance Aquapor) or private, or a consortium of public and private entities.

Private operators are both at local and national levels, because the same entity participates in different contracts. The most important private operators are: *Compagnie Générale des Eaux-Portugal* (French group Veolia Environnement), AGS (Portuguese group Somague-Environnement), Indaqua (Severn Trent Water International). Aquapor, hold by the public holding AdP (75,5%) is also a major operator and gets concession in association with other operators (AGS for example in Aguas de Cascais or Aguas da Figueira). In 2003, about 20 municipalities had conceded their water services to a private operator (see Table 2-2): hence, 22% of the total population is supplied through a (municipal or intermunicipal) concession contract. However, if we exclude Lusagua and Aquapor (that are subsidiaries of AdP), the



proportion of population supplied by a private operator is less than 5 %. For each municipality (or groups of municipalities), a separate entity must now be created (similarly to project finance).

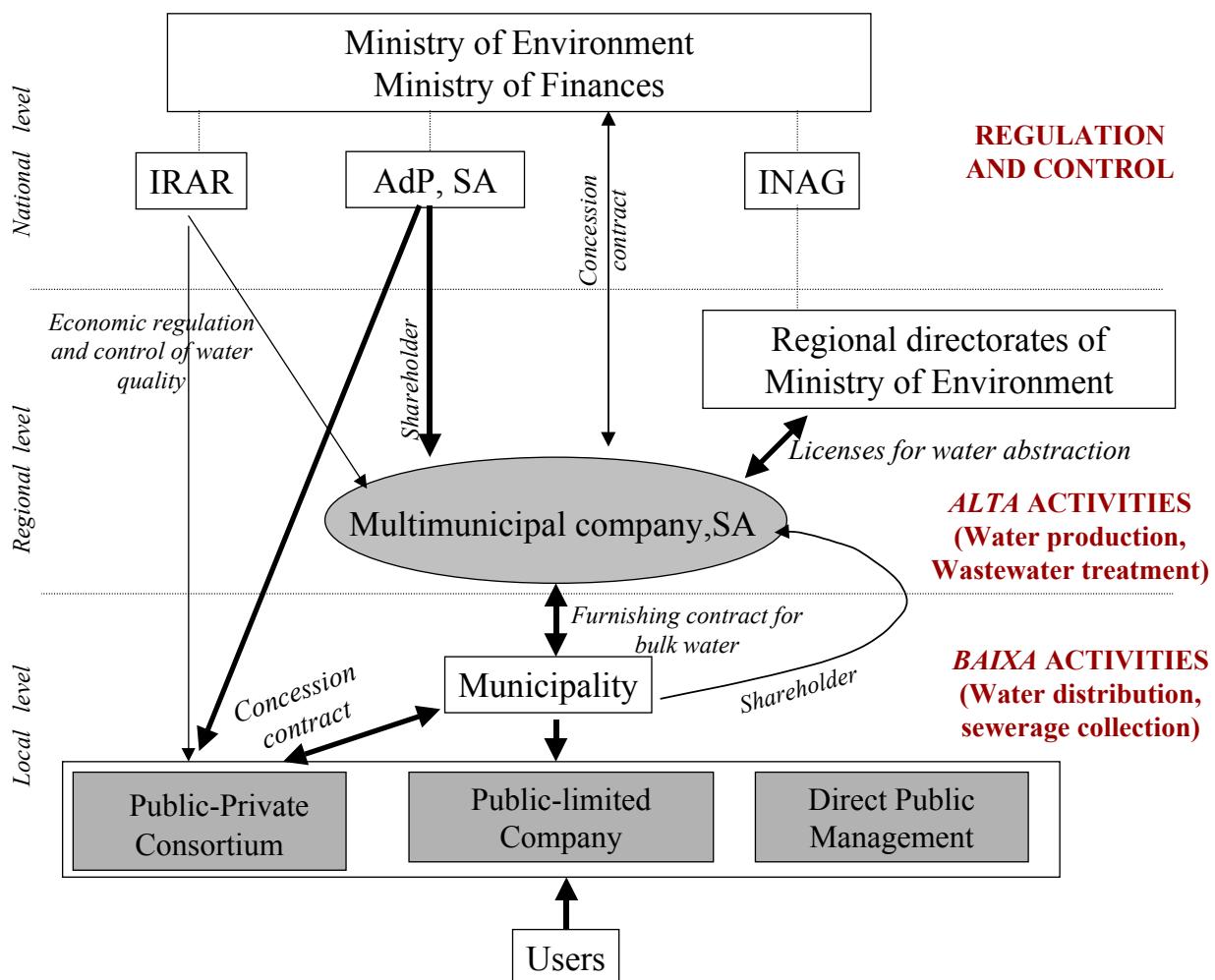
Table 7-4: Main concession contracts to public and private operators (excluding multi-municipal concessions)

Name of the company	Date of concession	Total population (2003)	Supplied population	Main shareholders
CGEP-Mafra	1994	55,000	55,000 (WS) 27,000 (San.)	CGEP
CGEP-Ourem-Fatima	1996	47,000	44,000 (WS) 12,000 (San.)	CGEP
Aguas de Valongo	2000	86,000	83,000 (WS) 68,000 (San.)	CGEP
Aguas de Paredes	2001	83,000	12,000 (WS) 12,000 (San.)	CGEP
Indaqua de Santo Tirso e Trofa	1999- 2024	108,000	26,000 (WS)	Indaqua (Severn Trent)
Indaqua Feira	1999-2034	135,000	43,000 (WS) 10,000 (San.)	Indaqua (Severn Trent)
Indaqua Fafe	1996-2021	53,000	13,000 (San.)	Indaqua (Severn Trent)
Tratave	1998-2022	400,000	400,000 (San.)	Lusagua (Adp) (60%) AGS (40%)
Aguas do Vouga	1996-2010		229,000 (WS)	Lusagua (Adp) (100%)
Aguas do Lena	1997-2011		16,000 (WS)	Lusagua (Adp) (100%)
Aguas do Planalto	1997-2011	77,000	77,000 (WS)	Lusagua (Adp) (100%)
Aguas de Teja	1997-2021	10,800	8,000 (WS) 6,000 (San.)	Lusagua (Adp) (100%)
Aguas do Sado	1997-2021	115,000	114,000 (WS) 105,000 (San.)	Lusagua (Adp) (60%) AGS (40%)
Aguas da Figueira	1999-2023	64,000	64,000 (WS) 48,000 (San.)	Aquapor (Adp) (40%) AGS (40%)
Aguas de Cascais	2000-2024	190,000	190,000 (WS) 171,000 (San.)	Aquapor (Adp) (30,5%) AGS (30.5 %)
Aguas do Carrazeda	2001-2031		8,500 (WS)	AGS (75 %) Scopul (25%)
Aguas de Gondomar	2001-2025	170,000	170,000 (WS) 99,000 (San.)	Aquapor (Adp) (42,5%) AGS (42.5 %)
Aguas de Alcanena (Lusagua)	2001-2015	17,000	17,000 (WS)	Lusagua (Adp)
Aguas de Santo Andre	2001-2025	30,000	29,000 (WS) 29,000 (San.)	EPAL
Centro de Lisboa	-	560,000	560,000 (WS)	EPAL
TOTAL	-	2,200,800	1,745,500 (WS) 1,000,000 (San.)	-
TOTAL without AdP	-	567,000	263,000 (WS) 142,000 (San.)	-

Source: AdP (2002) and own calculations. WS means water supply and San. for sanitation.

Figure 7-2 summarises the main stakeholders involved in WSS services in Portugal, with the type of relationships between them (e.g., concession contracts, control, shareholder). Financial flows are in bold.

Figure 7-2: Organisation of Water Actors in Portugal



As abovementioned, in practice the separation between alta and baixa activities does not occur in all situations. Multi-municipal companies also operate in retail systems.

7.3. SYNCHRONIC ANALYSIS OF THE LEGISLATION (POLICY ANALYSIS)

The following analysis aims at defining the action logic and objectives of legislation for the different stages of the water cycle, that are grouped into three sections: Resource Access, Water production and Wastewater treatment, and Water distribution and Sewerage collection. For each section, we will look at instruments, actors of implementation and effects of the policies.

7.3.1. *Resource Access*

7.3.1.1. *Property Rights on the Water Resource*

The ownership of water is clearly defined in the Civil Code of 1966. Groundwater is private property but its use is restricted to authorisation of withdrawal. Surface water is generally public owned, unless the water is generated in the boundary of the property and until it flows within it. The withdrawal of surface water is also subject to license.

7.3.1.2. *Public Policies on the Resource*

Anyway, the decree-law 372/93 forbids any private structure to withdraw water for domestic consumption) unless under a concession framework and only at the municipal level (and not multi-municipal) so that the access to water for an operator is very restricted.

Legislation in force

DL 74/90: criteria and standards for the protection, conservation and improvement of water quality (modification after, DL 52/99, 53/99, 54/99 and 56/99...)

DL 190/93 and 191/93: creation of DRARN (Regional Directorates for Environment and Natural Resources) and of the INAG (Institute for Water)

DL 372/93: restriction of the private operator to manage concession only for water distribution at a municipal level



DL 46/94 and 47/94: new licensing regime; INAG and DRARN are in charge with licensing the use of public water domain and with the implementation of the user-pays-principle and polluter-pays principle for all the licensed uses of water

D 182/99: protection and sustainable use of the water of the Spanish-Portuguese water basins

DL 382/99: protection perimeter around wells

DL 112/2002: National plan for water

Objectives: Resource access for water supply in Portugal is quite restricted, in order to keep the large-scale resource under public control and to protect the ground water resources and the quality of surface water.

Instruments:

- **Legal framework:** the resource abstraction for municipal water supply is restricted by law to public bodies, in order to keep public control on the resource. The planning for the use of these resources is steered by the National Water Plan proposed by INAG. This Water Plan gives broad orientations. Each basin is then supposed to prepare its own Basin Plan. All Basin Plans were not completed at the end of 2003.
- **International agreements:** as there are five major rivers shared with Spain (Douro, Tagus, Lima, Minho and Gardinia), the public policies on resources access also have an international aspect. The agreements with Spain (Decree 182/99 – Agreement 30/11/1998) define rules for water transfers and water quality¹³⁴.
- **Licenses:** the Regional Directorates for Environment deliver licenses for withdrawal and discharge (transposition of European Directive). These licences are compulsory.
- **Prescriptive instruments:** European standards are in force. A recent legislation (Decree-law 382/99) introduces another prescriptive instrument: the protection perimeter, but there are still very few protected resources.

¹³⁴ 64% of the Portuguese territory is part of a spanish-portuguese hydrographic basin. Important socio-economic interests are at stake: water supply of Lisboa depends on Tejo; the major part of hydroelectric energy depends on Douro and Lima, whereas the new electric plant Alqueva will be situated close to Guadiana; Minho is a nature area. The first agreement between Spain and Portugal dates back to 1864. In 1964 and 1968, two further agreements were signed. The 1998 Convention defines a co-operative framework fitting to WFD.

- **Incentives instruments:** the law (Decree-Law 46/94) forecasts the use of taxes on withdrawal and discharge, collected by Regional Directorates for Environment and INAG. But it seems that these taxes are not yet collected. This will probably change with the transposition of European WFD, and the implementation of Polluter-Pays-Principle.
- **Subsidies:** Contract-Programs monitored by INAG are state subsidies for water and sanitation projects, in order to reach the objectives of the Water National Plan.

Target groups:

As agriculture is the first user (more than 85% of the water used), farmers are directly concerned by the regime of licenses. They would also be concerned in the event of a withdrawal tax paid by everybody, as well as industrials and land owners. Concerning the WSS services, municipalities (still organised according to the "old" model) and multi-municipal companies are targeted. Besides, the Spanish government is also a target group.

Actors of Implementation:

Regional Directorates for Environment (together with regional Directorates of the ministry of Industry) are in charge of licensing. INAG, at the national level, is in charge of planning (the National Water Plan).

Rationale (overall approach):

If we control the abstraction of groundwater and surface water, then we will prevent an over-use of water and we will be able to provide sustainable water for the population.

If we control the discharge of pollution, we will be able to maintain a good quality for surface water and keep the potential drinking water safe.

Effects:

There are no indicators available to measure the outputs of environmental policy on resource access, such as the number of protection perimeters, the implementation of standards with discharge or the amount of funds channelled by withdrawal taxes. Furthermore, the legislation

is quite recent and the implementation might be not important. There are also no indicators available for the Spain-Portugal agreement.

It is quite difficult to appreciate the outcomes of the public policy of resource protection, as this policy is recent and not completely implemented. However the resource does not seem to be a problem in Portugal for the water supply system, except in summer in the coastal southern areas.

7.3.2. Water Production and Wastewater Treatment

In this section, we have chosen to group "*alta*" activities (water production and wastewater treatment), as they are treated in the same way since the 1993 reform.

Legislation in force

DL 379/93: regulation of the management of the multimunicipal and municipal systems for abstraction, treatment and distribution.

Many DL to create the multimunicipal systems from 1995 to 2003

DL 362/98 and 151/2002: Creation of IRAR, the regulation institute for water and solid waste.

L 176/99: Permission granted to the municipalities to hold the majority of the capital of a multimunicipal system.

P 993/2003: Creation of a tax to finance IRAR

Objectives:

The main objective is to increase production capacity in order to reach a coverage of 95% of population connected to piped water in 2006 (from 75% in 1993), and a coverage of 90% of the population to a treatment plant in 2006 (from 15% in 1993), the goals recommended by the European Union. In order to reach this objective, there are several sub-objectives:

- to introduce co-ordination for the production of bulk treated water and the treatment of wastewater at regional level to gain scale economies and concentrate skills, in order to guarantee the production of a good quality water;
- to develop a national public water industry that will be able to channel European funds efficiently.

These objectives imply great investments (see Table 7-5).

Table 7-5: Necessary investments

In million euros	Alta activities	Baixa activities	Total
Water distribution	1,096.4	681.9	1,778.3
Sewerage	1,270.9	1,182.2	2,453.1
Total	2,367.3	1,864.1	4,231.4

Source: MAOT(2000).

Other objectives include the preservation of the quality of surface water and bathing waters in the coastal areas, and the reduction of inequity between coastal and in-land regions.

Instruments:

- **Financial incentives:** Instruments used to reach the final objective are above all financial incentives. Each municipality is not able to apply alone correctly for the use of European funds. Thus, most of EU structural funds are channelled through a national state holding (AdP). Then, the municipalities are fostered to gather within a multi-municipal company (created by Decree-law), under control of AdP. The new company will have a critical size to realise big projects to supply water, subsidised at nearly 80% for the first generation (1993-1999) and 40% for the latest investments (2000-2006). Business plan are elaborated, including investments during the concession and tariffs for each municipality. Even if this is rather an incentive instrument, we should underline that the constitution of these multi-municipal systems had sometimes a mandatory aspect (in order to have continuous regions in the system).
- **Prescriptive instruments:** Standards for urban water discharge are a prescriptive instrument.
- **Mix regulation:** The multi-municipal companies are regulated first by a concession contract with the State and by the national regulator (IRAR), independent from the government (sunshine regulation). There is also a self-regulation, as the municipalities are simultaneously shareholder and clients of the multi-municipal system - they may regulate themselves.

Target Groups:

Municipalities, former responsible for the water production, are asked to gather within multi-municipal companies.

Actors of Implementation:

The main actors of implementation of this national policy or "regionalisation" and "entrepreneurialisation" of water management are national: AdP, IRAR and State (it signs concessions).

Rationale (overall approach):

The rationale that supports the creation of AdP and the multi-municipal companies is the following: in order to use quickly and efficiently the European funds to reach the coverage objectives, the financial management of funds should be centralised and public, and the municipalities should be financially encouraged to group to form public multi-municipal companies in charge of water production and wastewater treatment. The creation of new regional companies (with private status) should create a new dynamic with scale economies and transfer of skills within the group (for instance from EPAL to the newly created companies). If the municipalities are shareholders of the multi-municipal company, then they will accept more easily to give some of their responsibilities up. Besides they will contribute to the regulation of the system.

Effects:

Outputs:

- *Number of multi-municipal systems:* 16 multi-municipal companies have been created since 1993: 8 for water production and 8 for wastewater treatment. They supply 45% of the population for water production, and 23% for wastewater treatment.

- *Investments:* €405 millions have been invested between 1993 and 1999 for water production¹³⁵; SIMRIA and SANEST, the most important companies, devoted to wastewater treatment, invested €108 millions between 1993 and 1999; total investment for AdP in 2002 was €241 millions
- *Water production* of AdP amounted to 355 millions of m³ in 1999 and 465 millions of m³ in 2002.

Coverage rate have increased: *it amounts to 90% for water, 55% for treatment as presented in*

Table 7-6.

Table 7-6: The evolution of coverage rates

Year	% of population supplied with drinking water	% of waste water treated
1981	49.7 %	-
1984	51.6%	-
1987	52.2%	-
1990	62.5 %	-
1993	75 %	15 %
2000	90 %	55 %
2006 (obj.)	95 %	90 %

Source: Silva (1990), OCDE (2003)

Outcomes:

This system of regional integration helped creating dynamic enterprises and increasing the production. Results that we have in 2003 deal with the oldest multi-municipal systems, that were created in 1995, in the critical areas. For those urgent cases, subsidies were well used as they reached the most high-density areas. The policy of multi-municipal system fitted the area

¹³⁵ Data from AdP, concerning Aguas do Algarve, Aguas do Cavado, Aguas do Douro e Paiva.

where the density of population led to scarcity problems and where big projects were necessary. The scale economies were a potential for productivity.

In the other areas and in more recent systems, this potential is less important. Thus, the newly created systems will face further difficulties: they are operating in less rich and less densely populated areas and the level of EU subsidies sank (from 80% to 40%). The return on investment is consequently smaller. Many recent multi-municipal companies are not yet functioning.

The new model introduced a gap between the areas under multi-municipal system and the others. Hence, as far as social and territorial cohesion are concerned, the outcomes of the policy are mitigated.

The self-regulation by the municipalities is still to prove: tensions between the multi-municipal system and the municipalities occur sometimes; the relations between them is more on a client/furnisher relation, with IRAR being seen by the municipalities as a moral referee.

7.3.3. Water Distribution and Sewerage Collection

Legislation in force

DL .../40: creation of the SMAS, municipal water- and wastewater-specialized structure

DL 379/93: regulation of the management of the multimunicipal and municipal systems for abstraction, treatment and distribution.

Many DL to create the multimunicipal systems

DL 319/94: framework for concession contracts.

DL 362/98 and 151/2002: Creation of IRAR, the regulation institute for water and solid waste.

P 993/2003: Creation of a tax to finance IRAR

Objectives:

The main objectives concerning "*baixa*" activities are the same than "*alta*" activities: to connect 95% of population to piped water and 90% to sewerage network. But the sub-objectives are somewhat different, as water distribution and sewerage collection are supposed to be a local matter. One of the main sub-objectives is to improve the efficiency of the

management of distribution services and to foster private management for those "baixa" activities.

Instruments:

- **Legal framework:** the first instruments to improve water distribution are not financial, but legal. They create i) a legal framework for concessions to private operators, and ii) a new type of structure for direct municipal management: *Empresa Municipal* (Municipal Enterprise) to deal with the water and sanitation. This type of organisation is easier to manage, with less administrative work than the existing SMAS. AdP also gets involved in the water distribution, and, through Lusagua and Aquapor, participates in consortium that applies for concessions.
- **Prescriptive instrument:** the main instrument is prescriptive, with the obligation for the municipalities to build a sewerage system, as a result of the transposition of the European directives. Following the same directives, there are prescriptions (standards) on the discharge of wastewater.
- **Implementation of cost-recovery rates:** there is a great number of applied tariffs¹³⁶, most of them dissociated from costs. All national guidelines – following WFD – advocate for an increase of the water rates, that would provide financing for municipalities.
- **Furnishing contracts** between multi-municipal systems and the municipalities are to some extend a financial constraint to develop distribution networks, as the municipality agrees to buy a fixed amount of bulk water, or provide a fixed amount of wastewater: these volumes were often over-estimated. Thus, if the networks are not enough developed, the municipality is not able to supply the fixed amount of water that it should buy. Hence, it is an incentive to extend the network. However, municipalities often lack financing, and European funds are not easily accessible for them.

Target Groups:

¹³⁶ For instance, according to OECD (2001), water price in Lisbon was US\$0.97 in 1998 whereas in Coimbra it was US\$0.72 and in Porto US\$1.02.

Municipalities, private operators, IRAR for the control of water quality.

Actors of Implementation:

Regional Directorates for Environment (control of discharge), IRAR (control of concessions), multi-municipal companies, AdP.

Rationale (overall approach):

The implementation of a framework for concession will attract private financing and help developing distribution networks. In the same way, the creation of new types of public enterprises (EM) will facilitate an efficient management of WSS services. In addition, the delegation of the management to private operators (or public professionals), should improve the quality of service and the productivity of water services.

Effects:

Outputs: about 20 concessions were signed with operators for the "baixa" activities (there are around 300 municipalities in Portugal); but nearly half of these concessions concern Aquapor, (subsidiary of AdP), the public operator. On the whole, figures remain quite low: there was no enthusiasm on both sides. Some municipalities may wish to keep a relative local power, especially when the production has been transferred to a multi-municipal system. The creation of Municipal Enterprise for WSS services is still marginal but the municipalities who implemented it (e.g., Vila Nova de Gaia) reached good results.

Table 7-7Table 3.3 presents the evolution of the sewerage coverage and water coverage. However, the rates vary greatly among municipalities.

Table 7-7: Evolution of sewerage and water coverage since 1976

Year	% of population supplied with drinking water	% of population supplied with sewerage
1976	49.7 %	32.4 %
1981	51.6%	33.0 %
1984	52.2%	35.8 %
1987	62.5 %	37.6 %



1993	75 %	34.4 %
2000	90 %	75 %
2006 (obj.)	95 %	90%

Source: Silva (1990), OCDE (2003).

Outcomes: Despite the enormous progress made since the beginning of the 1980's, the situation is still very heterogeneous among municipalities. In addition, there is both a technical and financial gap between the production policy and the distribution policy: furnishing contracts, based on the future consumption, have been largely over-estimated. The distribution network as well as the sewerage network are still not sufficient enough to carry the produced water volume. While the EU funds were channelled by AdP for the "alta" activities, there are much less funds available for the distribution network. Thus there is a lack of coordination between the government policy for water production and wastewater treatment and the distribution and sewerage network left at the responsibility of the municipality.

7.3.4. *Synthesis*

7.3.4.1. *Table for the Comparison*

Table 7-8 summarises the main elements of this synchronic analysis of the legislation.



Table 7-8: Synthesis – Portugal

Public policy Water cycle	Objectives	Instruments*	Target groups	Actors of implementation	Effects	
					Outputs	Outcomes
1. Resource access	To preserve potential drinking water against pollution. To preserve the quantity of resource in the densely populated area. To limit resource access to public controlled enterprises.	<i>Leg.</i> National Water Plan and Basin plan Agreement with Spain on 5 common river basins <i>Pr.</i> Licenses for withdrawals and withdrawal taxes Protection perimeters around wells European standards on water quality <i>Inc.</i> Subsidies through contracts-Programs monitored by INAG	Farmers Industrials and land owners Municipalities and multi-municipal systems	Regional direction of the Ministry of Environment INAG	Low implementation of prescriptive instruments	Medium
2. Production	To guarantee water supply and quality, and reach different goals (e.g., 95% of population having access to piped water in 2006). To enhance the national water industry.	<i>Pr.</i> Standards of quality <i>Leg.</i> Access for water abstraction for WSS services restricted to public bodies; <i>Reg.</i> Municipalities are both shareholders and clients of multi-municipal system Sunshine regulation and recommendations of IRAR <i>Inc.</i> European subsidies to multi-municipal systems (channelled by AdP)	Municipalities Multi-municipal systems	AdP Multi-municipal systems State IRAR	High (increase of investments and creation of integrated system)	High outcomes in the oldest systems To be proved for the most recent multi-municipal systems
3. Distribution	To preserve the public health. To provide water of good quality to 95% of the population. To enhance the quality of service.	<i>Pr..</i> Standards of quality <i>Leg.</i> Framework for concession to operator Creation of new type of municipal firm for water Furnishing contracts between municipalities and multi-municipal systems Development of AdP in the distribution sector <i>Fin.</i> Implementation of cost-recovery for WSS services	Municipalities Private operators	AdP IRAR Multi-municipal systems	Medium	Medium
4. Sewerage	To preserve the quality of surface and groundwater. To enhance the quality of service. To enhance the national water industry. To reach commitments of the EU (90% of population whose wastewater is treated in 2006).	<i>Pr..</i> Standards of quality <i>Leg.</i> Framework for concession to operator Creation of new type of municipal firm for water Furnishing contracts between municipalities and multi-municipal systems Development of AdP in the sewerage sector <i>Fin.</i> Implementation of cost-recovery for WSS services	Municipalities Private operators	AdP IRAR Multi-municipal systems	Medium	Medium
5. Treatment	To preserve the quality of surface and groundwater. To reach the commitments of the EU (90% of population whose wastewater is treated in 2006). To enhance the national water industry.	<i>Pr.</i> Standards of quality <i>Reg.</i> Municipalities are both shareholders and clients of multi-municipal system Sunshine regulation and recommendations of IRAR <i>Inc.</i> European subsidies to multi-municipal systems (channelled by AdP)	Municipalities Multi-municipal systems	AdP Multi-municipal systems State IRAR Regional direction of the Ministry of Environment	Medium (increase of investments and creation of integrated system)	High outcomes in the oldest systems To be proved for the most recent multi-municipal systems

Notes: Leg. = Legal framework, Reg. = Regulatory framework, Pr. = Prescriptive instruments, Inc. = Incentives instruments, Fin. = Financial instruments.

7.3.4.2. Main Characteristics of the national model

The Portuguese model of management of WSS services is not yet completely stabilised, but it may be representative of choices made in an extension phase, where important investments are necessary to meet quantitative objectives. One can imagine that the model will evolve and join one of the European models, once most investments will be achieved. Anyway, there are currently two main characteristics of Portuguese management of WSS services: 1) a research for optimal size (to exploit scale economies) and 2) the development of an hybrid model of regulation, based on both contract and a regulatory agency.

Economies of scale can include three aspects: the optimal geographical area to manage services (local or regional or even national level), the optimal scope of services (water and sanitation associated or not) and the optimal aggregation of processes (water production associated with distribution or not). One important characteristic of the Portuguese organisation of the sector is the distinction between “*alta*” (water production and wastewater treatment) and “*baixa*” (water distribution and sewerage). “*Alta*” is managed by multi-municipal systems, controlled by the public national holding AdP, whereas “*baixa*” is under the local responsibility of municipalities who can decide either to manage the service themselves (through municipal services, SMAS or EM) or to delegate it to a (private or public) operator. Water and sanitation are sometimes dealt with together (for 8 multi-municipal systems), sometimes separately.

Table 7-9 summarises the choices made in Portugal regarding economies of scale.

Table 7-9: Economies of scale in Portugal

	WATER	SANITATION
Financing		National level (EU funds channelled by AdP)
"Alta" Water production and wastewater treatment	Regional level Public bodies at regional level (multi-municipal systems)	Regional level
"Baixa" Water distribution and sewerage		Public or private operators at local level

There are still open questions in this search of scale economies:

- what should be the optimal geographical management areas, in order to have a more equitable distribution? Currently, the recent multi-municipal systems accumulate difficulties, as they have a low density of population. Could they be associated with high-concentrated areas in order to share difficulties?
- Should "alta" and "baixa" be associated in the future, once the main investments are made, to guarantee a better fit to water demand?
- Should water and sanitation be systematically associated?

The second main characteristic of Portuguese management of WSS services is the regulation model, based both on concessions contracts (with private sector participation) and on a national regulator (IRAR) that is both an economic regulator and a regulator for water quality (contrary to the English model where both are separated). The whole picture of regulation in Portugal includes three mechanisms:

- a public ownership of multi-municipal companies that guarantees public control on resource;
- a framework for PSP with concession contracts (that fix the conditions of tariff setting, for instance) monitored by an independent regulation agency;
- a *sunshine regulation*¹³⁷ that can carry out audit and diffuse information.

Thus, the Portuguese management of WSS services is a transition model with a mix of features from the French and English model, in a context where important investments must be achieved quickly.

¹³⁷ see footnote 2, p. 12.

7.4. FUTURE TRENDS IN WATER PLANNING AND MANAGEMENT

7.4.1. Emerging Legislation

The new Water Law transposing the WFD

The organisation of water sector is not yet stabilised in Portugal. Forthcoming changes will include a new Water Law (currently discussed, as a transposition of WFD) and a clarification of WSS framework for private sector participation (PSP).

The Water Law will introduce basin authorities that should have the power to establish the polluter-pays principle and the recovery principle.

A clarification of the roles of private and public actors: future of AdP?

As far as the regulation of WSS services is concerned, a clarification of the roles of private and public actors is expected. Indeed, the first repartition of roles (in 1993) gave private operators the right to operate the "*baixa*" activities (water distribution and sewerage), while public bodies kept control over "*alta*" activities (water production and treatment of wastewater). However, when AdP bought Lusagua and begun through Aquapor to bid for concession contracts for "*baixa*" activities, there was a feeling (from private operators) that public bodies were going beyond their role, and would make private involvement more difficult. Thus, the government policy towards PSP needs now to be clarified. The future of AdP, in particular, is one open question largely debated in newspapers. There are several prospects, that imply various degrees of PSP:

- an opening of the "global" capital of AdP to private investors - in that case, the government would get money, but in practise, that would not imply major structural changes. That solution is not so attractive for private companies.
- A privatisation of Aquapor only, whose activities are "*baixa*" activities, through concession contracts with municipalities. In many cases, Aquapor is part of consortiums that include other private actors (banks, etc.).



- A complete disintegration of AdP, with the progressive opening of capital of various companies (including multi-municipal systems) to municipalities and private companies. The rationale behind this disintegration would be that AdP was meant as an instrument to channel EU funds efficiently, but that it would not be useful anymore, once most of the investment is made. In that case, private shareholders would be associated to the management of services. This solution is much more attractive for private operators. But it meets strong opposition from some municipalities. In the latest multi-municipal systems concession contracts, some municipalities kept the right to withdraw, in case of a privatisation of AdP. In that case, municipalities could also become the biggest shareholders (they are now limited to 49% of capital).

Whatever the solution chosen is, IRAR advocates that there should always remain a strong public administrative and technical capacity, in order to face any emergency case.

WSS services regulation: future of IRAR?

The regulation of water sector followed a path that is a bit different from the other network industries. The privatisation process of the telecommunication sector and the electric sector also led to the creation of regulatory agencies (namely ERSE, *Entidade Reguladora dos Serviços Energéticos*, for electricity and ICP, *Instituto das Comunicações de Portugal*, for telecom - recently renamed ANACOM, *Autoridade Nacional de Comunicações*), with similar objectives: oversight over operators in quality and price, protection of the consumer interests, licenses delivery, etc. However, although IRAR has been assigned more or less the same objectives, its powers are far less extended, as Fortunato and Martins (2002) suggest:

- concerning pricing policy, IRAR can only issue opinions (non-biding) on tariffs in the concession of multi-municipal and municipal systems, whereas the regulator of the electric sector, ERSE, establish the prices to be applied, and the regulator of telecom (ANACOM), determine the price through a convention with the competition agency and the concessionary of the universal service of telecommunications;
- concerning quality policy, in the contrary, IRAR has been assigned a lot of power recently, as it should now be responsible for the control of quality of drinking water for all services;

- concerning entry in the market, IRAR issues recommendations about the process of contest by adjudication of concessions of multi-municipal or municipal services, whereas ANACOM deliver licences to operators;
- concerning investment policy, the three regulators have similar roles, i.e. to issue an opinion about investment plans.

Thus, the future of the regulator (IRAR) is also an open question that will probably be discussed very soon. Its missions and powers could be reinforced depending on the direction chosen by the government. For the economic regulation of the sector, IRAR currently advocates for two main kinds of intervention: a structural regulation of the sector (organising general framework, enabling access to the market, etc.) and a regulation of the behaviours of public and private operators in the market (economic aspects and service quality). Several objectives stated by IRAR seem important:

- to maximise the benefits of scale economies,
- to integrate the various available sources of financing,
- to promote competition for the market,
- to clarify the role of the actors,
- to consolidate the regulation model.

Will IRAR have more coercive powers in the future, in particular on tariffs?

7.4.2. Overall Trends

Several liberalisation processes in a strong public sector

Portugal presents a somewhat paradoxical situation, as there is still a strong public ownership and control on water sector (water production in particular), while there are at the same time several liberalisation processes already implemented: the introduction of private status for the main operators of the sector - even public, the introduction of private sector participation

(PSP) through concession contracts, and the implementation of a sunshine regulation. These last two features are still on process, and their limits should be discussed.

The fundamental change in the management of WSS services since 1993 is the new entrepreneurial approach of the management, although it remained public in majority. While the public management was until 1993 very political (and it is still the case for autonomous public management, for instance the SMAS, where there are a lot of financial transfers from water budget towards the general budget of the municipality), new rules of corporate governance were introduced. Multi-municipal systems have a private status, and have independent and balanced budgets, and annual business plans.

Limits of these liberalisation processes

However, the effects of these liberalisation processes are still limited until now. PSP is still limited: only 20 concession contracts have been signed, and nearly half of them have AdP as a major public shareholder. The dominant position of Aquapor (AdP) in "*baixa*" activities is contested by Portuguese and foreign private operators. Regulation is still beginning. But the framework for further liberalisation is already built, as discussed previously.



7.5. CONCLUSION

The Portuguese water sector is characterised by the tremendous effort that should be produced in order to reach European standards for water supply and sanitation. Thus, there has been an important reform of the sector in the beginning of the 1990s. This reform looks for efficient trade-off in many aspects :

- a repartition of responsibilities between the various levels: the local level is in charge of water distribution and sewerage; the regional level is in charge of water production and wastewater treatment; finally, the national level provide funds from EU funds.
- a repartition of roles between public and private actors. PSP is encouraged for local activities, although this repartition needs to be clarified.
- a mix of regulation instruments, from concession contracts to sunshine regulation (diffusion of information by a national regulator).

It is quite difficult to assess the reform at this stage: most problematic situations have been addressed successfully, but the remaining path, in order to achieve ambitious objectives, is still long. Concerning WSS services, objectives for 2006 (95% of population connected to water supply and 90% of population connected to sewerage with wastewater treated) should be reached for water supply, but will certainly be revised for the treatment of wastewater. However, the model needs now to be clarified and stabilised. Concerning water resource management, the law is quite advanced, but it should be reinforced (efficient economic tools) and above all implemented. Important evolutions are now being discussed, and will condition any further liberalisation processes.

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8. CHAPTER 8: COUNTRY REPORT GERMANY

BRITTA PIELEN, NADINE HERBKE AND EDUARD INTERWIES¹³⁸

ABBREVIATIONS

AbwAG	Effluent Charges Act (Abwasserabgabengesetz)
AbwV	Wastewater Ordinance (Abwasserverordnung)
ATV-DVWK	German Association for Water, Wastewater and Waste (Deutsche Vereinigung für Wasserwirtschaft, Abwasser und Abfall)
AVBWasserV	Ordinance on General Conditions of Water Supply (Verordnung über Allgemeine Bedingungen für die Versorgung mit Wasser)
BGW	Federal Association of German Gas and Water Industries (Bundesverband der Deutschen Gas- und Wasserwirtschaft)
BfN	Federal Agency for Nature Conservation (Bundesamt für Naturschutz)
BMGS	Federal Ministry of Health and Social Security (Bundesministerium für Gesundheit und Soziale Sicherheit)
BMU	Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit)
BMVBW	Federal Ministry of Transport, Construction and Housing (Bundesministerium für Verkehr, Bau und Wohnungswesen)
BMVEL	Federal Ministry of Consumer Protection, Food and Agriculture (Bundesministerium für Verbraucherschutz, Ernährung und Landwirtschaft)
BMWA	Federal Ministry of Economics and Labour (Bundesministerium für Wirtschaft und Arbeit)
BMWZ	Federal Ministry for Economic Co-operation and Development (Bundesministerium für Wirtschaftliche Zusammenarbeit und Entwicklung)
BRD	Federal Republic of Germany (Bundesrepublik Deutschland)

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BW	Baden-Wuerttemberg (one of the <i>Länder</i>)
DDR / GDR	German Democratic Republic (Deutsche Demokratische Republik)
DST	Congress of German Cities (Deutscher Städtetag)
DStGB	German Federation of Cities and Municipalities (Deutscher Städte- und Gemeindebund)
DVGW	German Technical and Scientific Association for Gas and Water (Deutsche Vereinigung des Gas- und Wasserfaches)
KAG	Municipal Charges Laws (Kommunalabgabengesetze)
LAWA	<i>Länder</i> Water Working Group (Länderarbeitsgemeinschaft Wasser)
LMBG	Food and Utility Articles Act (Lebensmittel- und Bedarfsgegenständegesetz)
SRU	German Council of Environmental Advisors (Rat von Sachverständigen für Umweltfragen)
TVO	Drinking Water Ordinance (Trinkwasserverordnung)
UBA	Federal Environmental Agency (Umweltbundesamt)
VKU	Association of Municipal Enterprises (Verband kommunaler Unternehmen)
WHG	Federal Water Act (Wasserhaushaltsgesetz)
WVG	Water Association Act (Wasserverbandsgesetz)

8.1. INTRODUCTION

The diversity of institutions and organisational set-ups for water management across the EU Member States is remarkable and intriguing. On which grounds and due to which factors did this large variety of systems evolve? Can a trend of harmonisation based on EU legislation be observed? Which issues are currently high on the national water management agendas, and do they coincide across Europe? These are some of the questions that the fourth work package of the Euromarket project¹³⁹ aims to analyse on the basis of a comparison of seven national case studies, one of which centres on the Federal Republic of Germany.

The following basic facts can provide a good starting point for analysing the German water sector: Germany covers an area of 357,022 square kilometres and is densely populated, with a population of 82 million¹⁴⁰. In spite of its high population density and the high level of industrialisation, 54.1% of Germany is farmland and 29.4% woodland¹⁴¹.

Germany is a country rich in water. Of the water available per annum, i.e. the quantity of groundwater and surface water that is available every year as a result of precipitation loss, evaporation and inflows from neighbouring countries, only a total of about 3% is used for the public water supply¹⁴². The surface waters of Germany comprise six river systems and the coastal regions of the North and Baltic Seas. The Rhine, Weser, Ems, and Elbe Rivers drain into the North Sea, the Oder into the Baltic Sea and the Danube into the Black Sea. Natural lakes are mostly found in the North German lowlands and in the Alpine foreland and cover a total area of 1,213 km². There are 26 natural lakes with a surface area of more than 10 km² each, with the biggest lakes being Lake Constance and Lake Müritz. There are 291 dams in Germany (with a total capacity of retention of 3.9 billion m³), with the largest retention capacities located in the Rhine and the Elbe catchment areas.

¹³⁹ Euromarket is a research project on 'Water liberalisation scenarios: An empirical analysis of the evolution of the European water supply and sanitation sectors. The project is funded by the European Union under the "Energy, Environment and Sustainable Development" programme of the 5th RTD Framework Programme as well as by the Swiss Federal Office for Education and Science. More detailed information on the project has been made available at the project's web-site: <http://mir.epfl.ch/euromarket>.

¹⁴⁰ A population of 82 million inhabitants is equivalent to a population density of 231 inhabitants per square kilometre (the corresponding figure of the EU average is 116 inhabitants per square kilometre).

¹⁴¹ BMU, 2001a.

¹⁴² BMU, 2001a.

With this basic information on the geographical and water resource conditions of Germany in mind, this report gives an overview on:

- How the German water sector developed over the past 100 years, including legislative requirements and regulations, sectoral organisation and the underlying policy rationale;
- The main actors and stakeholders involved in the German water cycle;
- How German legislation was influenced by EU directives;
- The present status of the debate on the issue of liberalisation of the water and sanitation sector in Germany.

In tackling these issues, the report first gives an overview of the legislative and regulatory aspects of the German water and wastewater sector. To this end, the water sector is placed within the general institutional context of Germany, followed by a historical overview on the evolution of legislation in the field of water management and water service provision (Chapter 2). Chapter 3 then turns to outlining the policy instruments applied along the different stages of the water cycle, the instruments' target groups and implementing actors, and finally the outcome and effects of these policies. Chapter 4 briefly summarises the present status of the debate on the issue of liberalisation of water and sanitation service provision in Germany. Chapter 5 finally presents a summary on the discussed water management issues for Germany.

8.2. GENERAL FRAMEWORK FOR WATER MANAGEMENT

8.2.1. *Institutional Framework*

In Germany, water is a common resource, and its protection and management therefore is the object of collective decision-making, through elected representatives conferring democratic legitimacy and through the direct involvement of water users. The general framework for water resource protection, planning and management is thus embedded in the general political, legislative and government structure of the Federal Republic of Germany.



In Germany, legislative and enforcement powers are divided among the federal parliament (*Bundestag*); the second federal chamber, representing the *Länder* (*Bundesrat*); the parliaments of the sixteen *Länder*; and respectively, the federal government and the governments and authorities of the sixteen *Länder* (i.e. the states that are joined in the federation).

The federal constitution recognises the eminent role of the *Länder* and guarantees their statehood and autonomy¹⁴³. In the areas of nature conservation, landscape protection and water management, only framework legislation may be passed at the federal level¹⁴⁴, while the legislative detail to elaborate it has to be adopted by each *Land* individually. Water policy is one area where the competence of the *Länder* is pronounced, and this is of consequence for the institutional mechanisms for water management (Kraemer and Jäger, 1998).

The Basic Law (*Grundgesetz*) guarantees local authorities (cities, towns and rural districts), which are collectively referred to as municipalities (*Kommunen*), the right to self-government within the confines of the law¹⁴⁵. Municipal autonomy includes the responsibility for the local environment and the provision of vital services on their territory. Water supply and sewerage services are part of the services that must be made available to satisfy the basic needs of society. For the provision of adequate living conditions (*Daseinsvorsorge*), municipalities are entitled, within the framework of the *Land* in which they are located, to choose freely from a variety of institutional and organisational arrangements depending on their needs and circumstances: Municipalities have the right to establish or join single-purpose inter-municipal associations for water services (*Zweckverbände*) or water management associations (*Wasserverbände*). They can also establish or invest in joint-stock companies operating within or outside their territory¹⁴⁶. Section 8.2.4.4 describes in more detail the various institutional arrangements that municipalities may establish.

¹⁴³ This constitutional guarantee is absolute in that the articles in the constitution providing that guarantee cannot themselves be amended in any way. The guarantee is to remain in force forever and is understood to be an indispensable characteristic of the Federal Republic of Germany.

¹⁴⁴ Based on Article 75 nos. 3 and 4 of the Basic Law (*Grundgesetz*).

¹⁴⁵ Article 28 (2) of the Basic Law.

¹⁴⁶ International co-operation of municipalities or inter-municipal associations is also possible, for instance in order to assure the transboundary operation of sewerage installations (Trommer, 1994).



The *Länder* are empowered to enforce federal legislation as their own responsibility¹⁴⁷ and to set up the administrative and procedural arrangements required¹⁴⁸. In addition, the *Länder* have conferred powers upon municipalities to enforce many aspects of federal and *Land* legislation. Therefore, much of water resource protection, planning and management falls under the authority of the *Länder* and municipalities (at least in relation to specific areas and sectors), as indicated before.

The *Länder* are thus able to tailor legislation, institutional and organisational structures, and procedural arrangements to suit local and regional conditions and to reflect their policy priorities. Since 1956, when the *Länder* Water Working Group (*Länderarbeitsgemeinschaft Wasser* - LAWA) was founded by the *Länder* governments, the various approaches in policy and legislation concerning water management have been harmonised and co-ordinated through inter-governmental co-operation. This co-operation has brought about a convergence of water resource protection and management, as well as reporting procedures across the *Länder*, even though LAWA decisions and recommendation do not have the force of law.

The overall framework for water resource protection, planning and management in Germany is therefore characterised by the fact that there are three primary levels of competence in addition to the European Union: Federal Republic, *Länder* and municipalities. These do not form a strict hierarchy, but are each endowed with specific responsibilities. At all three levels (Federal Republic, *Länder* and municipalities), contracts or treaties have been concluded allowing for regional or inter-regional co-operation, sometimes concentrating responsibilities and resources in order to overcome the limitations that would otherwise result from the existence of political boundaries. In addition, water associations¹⁴⁹ may be formed for a variety of functions, in effect creating intermediate units of water management, usually set up following strict hydrological considerations.

Box 8-1 summarises again the objectives of the different competent authorities and institutional arrangements and details their legislative background.

¹⁴⁷ See article 83 of the Basic Law.

¹⁴⁸ Article 84 (1) of the Basic Law.

¹⁴⁹ Their scope includes the allocation of services among users, sewerage, the promotion of co-operation between agriculture and water management and other water management functions (Kraemer and Jäger, 1998).



Box 8-1: Allocation of Water Management Competencies in Germany

Institution	Legislation	Objectives
Federal Republic	Transposition of European Laws Federal framework laws 'Concurrent legislation'	Dealings at the European Court of Justice Administration of federal waterways EU Directives
Co-operation of <i>Bund</i> and <i>Länder</i>		Marine protection, Monitoring programmes
<i>Länder</i> Treaties	Framework for transboundary inter-municipal associations Establishing transboundary water management institutions	Transboundary water supply, sewerage, and water resources management
<i>Länder</i> Co-operation		Harmonising legislation and implementation
<i>Länder</i> Institutions		River basin management
<i>Länder</i> Parliaments and Governments	Transposition of European Laws <i>Länder</i> water laws 'Concurrent legislation'	
Water authorities and agencies		Implementation of Federal Legislation Collecting effluent charges Collecting abstraction charges Monitoring, enforcement, information
Water associations	Statutes	i.a. water supply, sewerage and water resources management, flood control
Inter-municipal associations	Statutes	Water supply and sewerage
	Local statutes and bye-laws	i.a. water supply, sewerage and water resources management, flood control

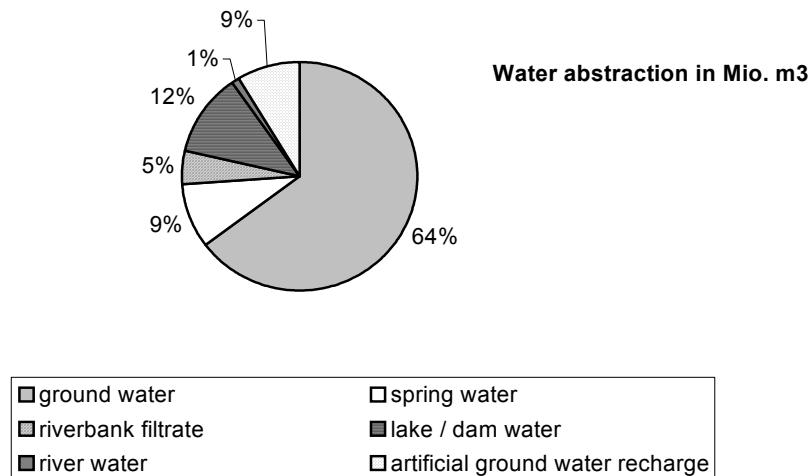
Source: Adapted from Kraemer and Jäger, 1998

8.2.2. Resource Status and Resource Use

Germany is a country rich in water resources: Water available (considered as the sum of precipitation and inflows from neighbouring countries, minus evaporation) amounts to 182 thousand million m³ per annum (valid long-term period 1961-1990) for Germany as a whole (UBA, 2001).



Figure 8-1: Water Abstraction Shares for Different Types of Raw Water in Germany



Remark: Artificial ground water recharge contains regular trickled surface water, proper ground water and when necessary riverbank filtrate.

Source: Statistisches Bundesamt, 2000.

In 2001, total water abstraction amounted to 38 thousand million m³, which is only 21% of the water available per annum. Water extraction by the manufacturing industries, the mining sector and the quarrying industries added up to around 7.8 thousand million m³ (4.3%) in 2001. In the same year, thermal power stations extracted some 24.8 thousand million m³ of water (13.6%) (Statistisches Bundesamt, 2002)¹⁵⁰. In 2001, water abstraction for the public water supply was about 5.4 thousand million m³ (3%) for domestic, trade, industrial and other uses (Statistisches Bundesamt, 2002).¹⁵¹ As Figure 8-1 shows, the bulk of drinking water in Germany is obtained from ground and spring water.

¹⁵⁰ Thermal power stations use the water mainly for cooling purposes, and meet their water requirements almost entirely from surface water (99.8 %) (BMU / UBA, 2001).

¹⁵¹ In 2000, only 0.2 thousand million m³ water was extracted for agriculture (used mainly for irrigation purposes) (BGW, n.d.).



Table 8-1: Public Water Supply in Germany

	1991		1995		1998 ¹⁾		2000*	
	Mio. m ³	%						
Public water supply	6,649		5,929		5,591		n/a	
Water supply of average consumers	5,748	100	5,094	100	4,859	100	4,800	100
Thereof:								
households and small trade	4,128	72	3,872	76	3,814	78	3,802	79.2
industry	1,045	18	811	16	1045	22	691	14.4
other consumers ²⁾	575	10	411	8			307	6.4
Own consumption of waterworks	143		124		132		n/a	
Leakage ³⁾	758		711		600		n/a	

1) In 1998, the data for industry and other consumers were given in total.

2) I.e. hospitals, schools, authorities and municipal facilities, Federal Armed Forces, agricultural undertakings.

3) Actual (i.e. pipe bursts) and seeming (i.e. measuring error) losses as well as statistical differences.

Source: Statistisches Bundesamt, 1998 and 2000; *BGW, n. d.

Table 8-1 shows that the water supplied to the average consumer in Germany decreased by about 19% within the last decade (1990-2000) (BGW, n.d.). This reduction could be achieved due to both technical measures as well as changes in the behaviour of consumers. In the same period, a reduction in leakage of around 20% was attained. In 2000, per capita drinking water consumption amounted to about 129 litres per day (BGW, n.d.).

Box 8-2: Key Figures for Water and Sewerage in Germany

Water	
Number of water distribution companies in 1998	6,709
Workforce in water services	18,000
Number of connections in 1998	81,132 thousand mio. (99 %)
Sewerage	
Number of wastewater treatment plants in 1998	10312
Total volume of wastewater in 1998	9.6 thousand mio. m ³
Percentage of connection in 1998	76,478 thousand mio. (93,2 %)
Total length of the networks in 1998	445,951 km

Source: Statistisches Bundesamt, 2000.

Box 8-2 presents a number of key figures on the German water and sewerage sector (i.e. the number of water distribution companies and the number of wastewater treatment plants).

8.2.3. General Description of the History of Water Laws

8.2.3.1. Overview

As already briefly introduced in section 8.2.1, the German *Länder* have legislative power inasmuch as the constitution, the Basic Law, does not grant this right to the Federal Republic.

In relation to water management in general (*Wasserhaushalt*), the Basic Law empowers the *Bund* merely to adopt framework legislation¹⁵².

Federal water management legislation consists mainly of the Federal Water Act, which provides a general legal framework for *Länder* legislation, and the Effluent Charges Act, which establishes economic incentives for reducing water pollution and provides financial resources for water resource protection measures.

As framework legislation, the Federal Water Act is designed to work in conjunction with the water laws of the *Länder*, which fill in the framework it provides. The Act applies to surface water bodies, including their beds, and to coastal (territorial) and groundwater. *Land* water laws may exempt minor water bodies from the regulations of the Act, and most *Länder* have made use of this possibility. No such exemptions can be made, however, for liability for damage to aquatic ecosystems and water quality requirements.

All *Länder* have passed fairly similar legislation concerning the way in which municipalities may organise their water management functions, in particular water supply and sewerage services. Clauses similar to the federal guarantee are contained in all *Land* constitutions and provide the legal foundation for local government legislation contained in *Land* Municipalities Acts (*Gemeindeordnungen*) granting municipalities the competencies required for the provision of adequate living conditions on their territory (*Daseinsvorsorge*).

In the following section, the development of the most important German water management laws is described based on main historical phases and changes in policy rationales.

8.2.3.2. History

The current German legal framework for water management and planning is the result of the transfer of limited legislative competencies from the *Länder* to the Federal Republic in 1957 and the development of European water legislation since the 1970s¹⁵³.

¹⁵² Article 75 no. 4 of the Basic Law.

¹⁵³ This chapter builds on the "Overview of German water law" by Horst Roth (see Lersner and Beherendes, n.d.).

PHASE 1 – UNTIL 1957: THE LEGISLATIVE BACKGROUND

Prior to 1957, water laws dating from the late 19th and early 20th century were still in force. In Baden-Wuerttemberg, for instance, the Baden Water Act of 26 June 1899, the Wuerttemberg Water Act of 1 December 1900, the Prussian Water Act of 7 April 1913 and various Hessian laws, as well as other minor legislation, applied to different parts of the *Land*, depending on which previous state they had belonged to. Only the Prussian Water Act was common in large parts of Germany (Kraemer and Jäger, 1998). Accordingly, legislation applying to water management in Germany was characterised by a high degree of diversity and fragmentation, with a co-existence of a multitude of different legislative requirements and regulations within one *Land*.

As a result of the division of Germany into two separate states after 1945, namely the Federal Republic of Germany (Bundesrepublik Deutschland - BRD) and the German Democratic Republic (Deutsche Demokratische Republik - DDR), water law developed differently in the two countries. For the purpose of this report, only the development of water law within the BRD and - after the unification in 1990, in the united Germany - is described in the following sections¹⁵⁴.

PHASE 2 – 1957-1963: INCREASED DRINKING WATER QUALITY THROUGH STANDARDS

Since 1945, the water demand of the industrial and agriculture sector, as well as of households, increased constantly. As a result, the quantity of waste water increased, leading to increased pollution of water bodies. Due to this development and the existing legal fragmentation (see above), the need for a new legislative framework was evident, and the **Federal Water Act** (*Wasserhaushaltsgesetz* - WHG¹⁵⁵) was passed by the *Bundestag* almost unanimously on 27 June 1957. The WHG sets out the framework for water management in Germany.

¹⁵⁴ In the German Democratic Republic (DDR), the Act of 7 April 1963 on the protection, the use and the maintenance of the water bodies and the prevention of flood risk (Water Act, *Wassergesetz*) provided since then a legal framework for water management (Lersner and Behrendes, n.d.).

¹⁵⁵ Act on the Regulation of matters relating to water (*Gesetz zur Ordnung des Wasserhaushalts*), of 27.07.1957, Federal Law Gazette I 1957, p.1110, 1386.

By the end of the fifties, the directives and recommendations enacted by that time with regard to drinking water (such as the DIN 2000¹⁵⁶) did not apply as an obligatory legal norm. In 1959, when the **Drinking Water Treatment Ordinance** (*Trinkwasseraufbereitungsverordnung*¹⁵⁷) was enacted, it constituted the first legal regulation to introduce a binding approach with quality standards for drinking water.

The policy rationale underlying the development in this legislative phase can be summarised as:

If we want to increase drinking water quality, consistent legally binding standards have to be established.

PHASE 3 – 1964-1975: INCREASED MONITORING OF DRINKING WATER

In the years following the introduction of the WHG, a number of legislative changes were introduced that aimed to increase quality standards and create stricter monitoring and enforcement rules in order to improve public health and prevent water-borne epidemics.

In the 2nd amendment to the **Federal Water Act of 1964**, new regulations on handling substances hazardous to water were adopted. The combination of increasing pollution of coastal waters and declining water quality of inland waters, notably in estuaries, necessitated regulations to protect coastal waters. Therefore, the scope of the Federal Water Act, in particular the regulations on water pollution prevention, was extended to coastal waters in the 3rd amendment to the **Federal Water Act of 1967**.

In 1961, article 11 of the **Federal Epidemics Act** (*Bundesseuchengesetz*¹⁵⁸) provided a basis for defining legally binding requirements for drinking water quality. However, the Federal Epidemics Act was made concrete no more than 14 years later by the **Drinking Water Ordinance** (*Trinkwasserverordnung - TrinkwV*¹⁵⁹) **of 1975**. The Drinking Water Ordinance was adopted as concurrent legislation defining detailed quality standards for drinking water

¹⁵⁶ Principles for drinking water standards, planning, construction and operating of the facilities.

¹⁵⁷ Ordinance on addition of external substances during the drinking water treatment (*Verordnung über den Zusatz fremder Stoffe bei der Aufbereitung von Trinkwasser*), of 19.12.1959, Federal Law Gazette I 1959, p. 762.

¹⁵⁸ *Gesetz zur Verhütung und Bekämpfung übertragbarer Krankheiten beim Menschen*.

¹⁵⁹ Ordinance on the quality of water for human use (*Verordnung über die Qualität von Wasser für den menschlichen Gebrauch*), of 31.01.1975.

and for monitoring and enforcement¹⁶⁰. The determined minimum standards were essential to protect the health of drinking water consumers.

The policy rationale underlying this development can be summarised as:

If we want to increase public health and prevent water-borne epidemics, then stricter quality standards with adequate monitoring and enforcement rules have to be introduced.

PHASE 4 – 1976-1985: STRONGER REGULATIONS ON DISCHARGES

In the following legislative phase, efforts were made to further increase the protection of the quality of water resources, by establishing further controls and regulations on discharges of wastewater and its treatment, as well as on the handling of substances hazardous to waters.

In the 4th amendment to the **Federal Water Act of 1976**, the material regulations, including penal and finable provisions, were extensively modified. Several regulations were adapted to the recent requirements of water management. The water quality regulations were considerably extended; in particular, the requirements on the discharge of wastewater into waters (Article 7a WHG) and installations handling substances hazardous to waters (Article 19 WHG), as well as framework plans for water resources management to be drawn up for river basins or economic regions (Article 36b WHG), were newly inserted into the Federal Water Act.

An important organisational modification was introduced by Article 18a paragraph 2a of the WHG, which gives the *Länder* the opportunity to transfer, either completely or in part, their wastewater disposal to a so-called private ‘third party’ (*Dritte*) for a limited period and under a revocable arrangement¹⁶¹.

A further important step towards tighter regulations on discharges was marked by the introduction of the **Effluent Charges Act** (*Abwasserabgabengesetz* - AbwAG¹⁶²), which was adopted by the German *Bundestag* on 20 May 1976. The act provides that a charge is payable

¹⁶⁰ Article 74 no. 20 of the Basic Law.

¹⁶¹ The *Länder* Baden-Wuerttemberg and Saxonia have adopted this option in their *Land* Water Acts (Article 45c para. 3 Water Act of Baden-Wuerttemberg and Articles 57 para. 3, 63 para. 4 Saxon Water Act).

¹⁶² Act on Charges for the Discharge of Wastewater into a Body of Water (*Gesetz über Abgaben für das Einleiten von Abwasser in Gewässer*).

when effluent is discharged directly into a body of water. The charge was the first eco-tax levied at the federal level as a steering instrument. It ensures that the polluter-pays principle is applied in practice, since it requires direct dischargers to bear at least some of the costs that their use of the environmental medium water involves. The charge is determined on the basis of the quantity and harmfulness of specific constituents discharged into the water¹⁶³ and is intended to create an economic incentive to reduce effluent discharges as far as possible. For this reason, the Effluent Charges Act also provides for reductions in the rate levied in cases where the party liable to pay the charge satisfies certain minimum requirements. In addition, certain investments made to improve wastewater treatment can be set off against the charge. Effluent charges are payable to the *Länder* (BMU and UBA, 2001a).

In **1980**, the Drinking Water Ordinance was complemented by the **Ordinance on General Conditions of Water Supply** (*AVBWasserV*¹⁶⁴), which provided a framework for public water supply contracts between supplying companies and consumers.

The policy rationale underlying this development in the fourth historical phase of legislation can be summarised as:

If we intensify water treatment regulations and regulate discharges with respect to their harmfulness, then we will preserve the quality of our water bodies.

PHASE 5 – 1986-1995: IMPROVEMENTS IN WATER QUALITY & INTEGRATED MANAGEMENT

On behalf of a more effective water protection, as well as for reasons based on adjustments to the recent EC legislation, stronger requirements on the discharge of hazardous substances in waters had to be enforced in the Water Act. Therefore, in the 5th amendment to the **Federal Water Act of 1986**, new provisions regarding the discharge of hazardous substances into waters and groundwater protection were provided.

Following **German Unification in 1990**, the regionalised structure under central control in the former German Democratic Republic (GDR) was confronted with the legal and

¹⁶³ The charge per pollution unit was raised in several stages from the initial 12 DM (equivalent to 6.14 €) in 1981 to 40 DM (equivalent to 20.45 €) in 1986.

¹⁶⁴ *Verordnung über Allgemeine Bedingungen für die Versorgung mit Wasser*, of 20.06.1980, Federal Law Gazette 1980 I, p. 750, amended p. 1067.



administrative structures of the Federal Republic of Germany, with its emphasis on self-government. Therefore, further changes in the water management legislation were needed:

An important development within this phase has been the **Water Association Act (Wasserverbandsgesetz - WVG¹⁶⁵) of 1991**, which allows for the formation of so-called Water User Associations¹⁶⁶: These are self-financing institutions used for the construction and finance of water infrastructure. Their scope includes the allocation of services among users, sewerage service provision, the promotion of co-operation between agriculture and water management and other water management functions (Kraemer and Jäger, 1998). A water association can be established by the unanimous decision of all interested parties and subsequent approval by the supervisory authority, or by majority decision of interested parties and approval including the enforced participation of additional members (Kraemer, Pielen and Leipprand, 2003).

The 2nd and 3rd amendments to the **Effluent Charge Act of 1986¹⁶⁷** and **1990¹⁶⁸** aimed to increase the incentive character of effluent charges through the involvement of phosphorous and nitrogen, and also raised the rates charged¹⁶⁹. Furthermore, the aim of the amendment was to decrease the required administrative effort during the charging process. In **1994**, the 4th amendment to the **Effluent Charges Act¹⁷⁰** extended the possibility of setting the investments for building new or upgrading existing wastewater treatment plants against the debts of charges.

¹⁶⁵ Act on Water and Soil Associations (*Gesetz über Wasser- und Bodenverbände*), of 12.02.1991, Federal Law Gazette 1991 I, p. 405.

¹⁶⁶ Previously, in 1937, ancient customary traditions and many different *Land* Water and Soil Association Laws had been replaced with a Water Association Act common to the whole of Germany. Amendments, even if overdue, could not be agreed upon before 1991 because of a conflict over competencies between the Federal Republic and the *Länder*. The 1991 revision came in time to provide a modernised framework for the new *Länder* of the former German Democratic Republic (Kraemer and Jäger, 1998).

¹⁶⁷ As published in the announcement of 30.12.1986, Federal Law Gazette 1986 I, p. 2619.

¹⁶⁸ As published in the announcement of 6.11.1990, Federal Law Gazette 1990 I, p. 2432.

¹⁶⁹ Up to 70 DM with effect from 1 January 1997 and 35,79 € from 1 January 2002 respectively.

¹⁷⁰ As published in the announcement of 3.11.1994, Federal Law Gazette 1994 I, p. 3370, most recently amended by act of 3.05.2000, Federal Law Gazette 2000 I, p. 632, most recently amended by article 19 of the act of 9.09.2001, Federal Law Gazette 2001 I, p. 2331 (2334).



With the determination of 66 limit values on the quality of water intended for human consumption, the **Drinking Water Directive 80/778/EEC**¹⁷¹ was targeted to protect drinking water against dangers arising from bacterial and chemical pollution. At a later date, the former Federal Republic implemented this directive by enacting an amended **Drinking Water Ordinance** (of 1986 and 1991¹⁷², respectively). This ordinance is based on article 11 of the Federal Epidemics Act (see above) and article 10 paragraph 1 of the **Food and Utility Articles Act** (*Lebensmittel- und Bedarfsgegenständegesetz* - LMBG¹⁷³). In order to prevent the exhaustion of the determined limit values, the Drinking Water Ordinance contained the commandment to minimise harmful chemical substances (the so-called “*Minimierungsgebot*”).

The policy rationale underlying the described development in phase 5 can be summarised as:

If we reduce harmful substances, decrease bacterial and chemical pollution and establish an integrated water management, then we will improve water quality and preserve our water bodies.

PHASE 6 – 1996-2000: IMPROVED TREATMENT OF DISCHARGES TO THE ENVIRONMENT

The 6th amendment to the **Federal Water Act of 1996** contained alterations to the law on wastewater discharge relating to waterway engineering, flood protection and frequently flooded areas. The law required that the technology involved with the discharge of wastewater be state-of-the-art (Kollmann, 1997).

The **Wastewater Ordinance** (*Abwasserverordnung* – AbwV) of 1997¹⁷⁴ was one of the first measures to implement the 6th amendment to the Federal Water Act. It regulates, among other things, the requirements for the discharge of wastewater within the scope of municipal handling of wastewater (concretises Article 7a WHG) and implements European requirements

¹⁷¹ Council Directive 80/778/EEC of 15 July 1980 relating to the quality of water intended for human consumption, OJ EC L 229, 30.08.1980, p. 11-29.

¹⁷² At the same time, the Drinking Water Treatment Ordinance (last amended by the Ordinance of 13.12.1979, Federal Law Gazette I 1979, p. 2328) was overruled.

¹⁷³ Act concerning trade in food, tobacco products, cosmetics and other utility articles, first adopted on 15.08.1974, Federal Law Gazette I, p. 1946; last amendment as published in the announcement of 9.09.1997, Federal Law Gazette 1997 I, p. 2296.

¹⁷⁴ Of 21.03.1997, Federal Law Gazette 1997 I, p. 566.

for the protection of water bodies. In the 2nd amendment of 1998¹⁷⁵, the **Wastewater Ordinance** was extended by appendices with specific regulations for domestic wastewater and for various industries.

The policy rationale underlying this development in phase 6 can be summarised as:

If we intensify legally binding sewerage treatment regulations, then we will preserve the quality of our water bodies.

PHASE 7 – AFTER 2000: IMPLEMENTATION OF THE WATER FRAMEWORK DIRECTIVE

The 7th amendment to the **Federal Water Act of 2002**¹⁷⁶ implements the European requirements, especially the **EC Water Framework Directive**¹⁷⁷, which came into force on 22 December 2000. This amendment focused on several factors: the integral river basin-related approach within the management of water bodies; the water resources objectives, with the aim of achieving good ecological water status by the end of 2015; principles for the identification and evaluation of water quality; and preparing river basin-related measures and River Basin Management Plans for achieving the Directive's objectives.

Moreover, the list of appendices in the **Wastewater Ordinance**¹⁷⁸, which replaced the previously existing administrative regulations, was completed by further amendments to the ordinance.

In the new European **Drinking Water Directive 98/83/EC**¹⁷⁹ of 1998, parametric values were reviewed and, when necessary, strengthened in accordance with the latest available scientific knowledge. This directive was put into national legislation by the amended **Drinking Water Ordinance of 2001**¹⁸⁰, which is streamlined to parameters essential for health and the environment¹⁸¹. Furthermore, the ordinance increased transparency by defining

¹⁷⁵ Of 22.12.1998, Federal Law Gazette 1998 I, p. 3919.

¹⁷⁶ As published in the announcement of 19.08.2002, Federal Law Gazette 2002 I, p. 3245.

¹⁷⁷ Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a Framework for Community Action in the Field of Water Policy, OJ EC No. L 327, 22.12.2000, p. 1.

¹⁷⁸ Last amended as published in the announcement of 15.10.2002, Federal Law Gazette 2002 I, p. 4047, 4550.

¹⁷⁹ Council Directive 98/83/EC of 3 November 1998 on the quality of water intended for human consumption, OJ EC No. L 330, 5.12.98, p. 32.

¹⁸⁰ As published in the announcement of 21.05.2001, Federal Law Gazette I 2001, p. 959.

¹⁸¹ The 66 parameters have been reduced to 48 (50 for bottled waters), including 15 new parameters.

the point of use as the point of compliance with the quality standards as determined in the henceforth so-called "tap water directive"¹⁸².

The policy rationale underlying this development in phase 7 can be summarised as:

If we comply with European legislation, implement the integrated River Basin Management approach and achieve good water status at the river basin scale, then we will improve the condition of the overall aquatic environment and achieve sustainable water management.

8.2.4. Main Public and Private Actors Involved

In the following section, the current organisation of the German water sector is presented and the main actors are briefly introduced.

8.2.4.1. Parliaments

In Germany, legislative competence is held by parliaments which also exert democratic control over the executive activities of governments. The *Land* water laws are thus debated in and adopted by the *Land* parliaments; the *Land* governments are answerable to their respective *Land* parliament. In this way, an important part of decision-making processes in water management takes place in relatively small territorial units. The proximity of decision-makers to the water bodies affected allows for specific regional conditions to be taken into account in the legislative process. Proximity is an even more significant aspect of municipal parliaments or councils because of their influence over water supply and sewerage. They are usually elected by the population of the area supplied, as supply areas often coincide with municipal borders (Kraemer and Jäger, 1998). There is also a variation in the composition of the decision-making bodies of regional associations, municipal parliaments, municipal committees, member assemblies of associations, and supervising councils and advisory boards of private water utilities (BMU and UBA, 2001b).

¹⁸² On 1 January 2001, the former Federal Epidemics Act was superseded by the Infection Protection Act (*Infektionsschutzgesetz – IfSG*, of 20.07.2000, Federal Law Gazette 2000 I, p. 1045) which provides the new basis for the Drinking Water Ordinance.



In the case of federal laws, which require the consent of the *Länder*, the *Länder* participate in the legislative process through the *Bundesrat*. This also applies to other instruments of law, such as administrative regulations (*Verwaltungsvorschriften*) and ordinances (*Verordnungen*) of the federal government, which equally require the consent of the *Bundesrat*.

8.2.4.2. Institutions at the Federal Level

Based on the general description of the institutional framework under section 8.2.1, the most important ministries, authorities and agencies at the federal level are listed systematically in the following section, together with other institutions which are involved in water management more marginally.

The **Federal Ministry of the Environment, Nature Conservation, and Nuclear Safety** (*Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit* - BMU) deals with water resource management and transboundary co-operation as a part of environmental policy. The Federal Ministry for the Environment has control over the Federal Water Act, the Wastewater Charges Act, the Detergents and Cleaners Act and the Federal Nature Conservation Act. It is responsible within Germany for European Union water protection provisions, protection of the marine environment and for the river basin commissions for transboundary waterbodies (BMU and UBA, 2001a). It supervises the Federal Environmental Agency (*Umweltbundesamt* - UBA) and the Federal Agency for Nature Conservation (*Bundesamt für Naturschutz* - BfN).

The partners of the Federal Ministry for the Environment are the following federal ministries:

the **Federal Ministry of Consumer Protection, Food and Agriculture** (*Bundesministerium für Verbraucherschutz, Ernährung und Landwirtschaft* - BMVEL) deals with and promotes water resource management in rural areas, including flow regulation, flood control and coastal protection in the North and Baltic Seas; the **Federal Ministry of Health and Social Security** (*Bundesministerium für Gesundheit und Soziale Sicherheit*- BMGS) ensures the quality of drinking water; the **Federal Ministry of Transport, Construction and Housing** (*Bundesministerium für Verkehr, Bau und Wohnungswesen* - BMVBW) is in charge of the administration of federal waterways and all matters relating to navigation on inland and maritime waterways; the **Federal Ministry of Economics and Labour** (*Bundesministerium für Wirtschaft und Arbeit* - BMWA) safeguards economic interests in environmental

protection and has general responsibilities for prices, charges and tariffs for water supply (and sewerage). International co-operation is overseen by the **Federal Ministry for Economic Cooperation and Development** (*Bundesministerium für Wirtschaftliche Zusammenarbeit und Entwicklung – BMWZ*).

The **German Council of Environmental Advisors** (*Rat von Sachverständigen für Umweltfragen - SRU*) is a scientific advisory body of the Federal Government (*Bundesregierung*) with the objective of describing and surveying the environmental situation and policy in Germany, as well as trends in their development. Furthermore, the council points out environmentally damaging trends and presents options for preventing or eliminating them. Every two years, the advisory council has to furnish an expert opinion that describes and comments on current environmental developments and special topics (among other things, the water sector).

8.2.4.3. *Institutions in the Länder*

Länder institutions are of great importance, as competence for water management is primarily located in the *Länder*. All *Länder*, except the City States of Berlin and Hamburg, have authorities supported by technical agencies. In addition, competencies for water resource protection and management are in most *Länder* allocated to several levels of government, normally following the general structure of the administration. The following three-level split is prevalent, though variations in the precise allocation of responsibilities exist:

- **Supreme Water Authority** (*Oberste Wasserbehörde*): Usually the Ministry of the Environment is responsible for strategic decisions in water management and supervision of lower water authorities and agencies;
- **Upper Water Authority** (*Obere, höhere oder mittlere Wasserbehörde*): Usually the regional government (*Regierungspräsidien*, *Regierungspräsidenten* or *Bezirksregierungen*) is responsible for regional water management planning, permitting, licensing (for uses with regional impact) and other water management functions, and administrative procedures;
- **Lower Water Authority** (*Untere Wasserbehörde*): Usually cities, city districts and rural districts, as well as technical agencies (*Wasserwirtschaftsämter*), are responsible for permitting, licensing (for small uses), monitoring, technical advice and other enforcement functions.



The precise allocation of the various water management functions thus varies considerably among the *Länder*, as do the number of levels of individual institutions. In general, the decentralisation of administrative structures increases with the size and population of a *Land* (Kraemer and Jäger 1998).

8.2.4.4. Municipalities

As described in section 8.2.1, municipalities are responsible for activities of central importance for maintaining adequate living conditions on their territory (*Daseinsvorsorge*), among them water supply and sewerage services, as well as for the development and maintenance of water bodies of local importance. For this purpose, German municipalities have developed specific institutional organisational solutions. Box 8-3 illustrates the various institutional arrangements.

Box 8-3: Institutional Arrangements at the Municipal Level

Municipalities have the choice among a number of institutional arrangements for fulfilling their responsibility of providing adequate living conditions on their territory, among them water supply and sewerage services. The choices made depend on the municipalities' specific circumstances, such as the size of the municipality, the nature of the activity and legislation of the respective *Land*. The possible institutional arrangements (in order of decreasing integration into municipal administration) which can be selected include the following:

Organisational arrangements under public law include:

Direct labour (*Regiebetrieb*);

Semi-autonomous municipal agency (*Eigenbetrieb*);

Inter-municipal association (*Zweckverband mehrerer Kommunen*);

Water and soil management association (*Wasser- und Bodenverband*).

Organisational arrangements under private law include:

Municipal enterprise (*Kommunale Eigengesellschaft*);

Public enterprise (*öffentliche Gesellschaft*);

Delegation to a private enterprise (*Beauftragung privater Unternehmen*);

Operator Model (*Betreibermodelle*);

Concession agreement (*Konzessionsmodell*).

Semi-autonomous municipal agencies, inter-municipal associations and municipal enterprises are the most typical arrangement for municipal water management in Germany (see also Table 8-2).



Those institutional arrangements (presented in Box 8-3) which are of greatest relative importance are hereafter described in greater detail¹⁸³.

While only 1.3 percent of municipalities chose **direct labour** (*Regiebetrieb*) as an institutional arrangement, it is nevertheless still an important arrangement for small municipalities, and therefore presented here. In this case, water supply and sewerage services are run directly by the municipal administration using its own staff. Water supply and sewerage are thus fully integrated into municipal administration. Direct labour or *régie directe* is relatively common in other countries, and increasingly German municipalities have abandoned traditional direct labour and given more autonomy to sewerage services.

German municipalities may establish **semi-autonomous agencies** (*Eigenbetrieb*). These are separate from general municipal administration and have a separate budget, resulting in a relatively high transparency of its financial affairs. Many *Länder* allow or enforce this organisational arrangement for all but the smallest municipalities for which direct labour or municipal co-operation in **inter-municipal associations** (*Zweckverbände*) are appropriate¹⁸⁴. An inter-municipal association can be established for a specific long-term purpose, including water supply and sewerage. An inter-municipal association is a public law corporation under *Land* legislation, making it possible for municipalities to transfer their responsibility for sewerage service provision to them.

Economic activities pursued by municipalities in the provision of public services and the establishment of **municipal enterprises** (*Eigengesellschaften*), which are wholly owned joint stock companies (AG) or partnerships with limited liability (GmbH), are key elements of municipal autonomy in Germany. The legal foundation is laid out in the Municipalities Acts of the *Länder* (*Gemeindeordnungen*).

A separate contractual arrangement is the delegation by a municipality of its water supply to a private company through **concession agreements**; this practice historically developed mainly in North Rhine-Westphalia, with the Gelsenwasser AG water company and the Rheinisch-

¹⁸³ For a more detailed discussion and description of the different institutional arrangements at the municipal level, cf. Büschner (2001) and Kraemer and Jäger (1998).

¹⁸⁴ In this way, municipalities are increasingly induced to abandon direct labour without giving up control over the provision of vital public services.

Westfälische Wasserwerks-gesellschaft (RWW), which is now part of the RWE Thames Water Group.

Table 8-2 outlines the relative importance of the different institutional arrangements at the municipal level in Germany.

Table 8-2: Institutional Arrangements at the municipal level & their relative importance

Organisational Form ¹⁸⁵	Description ¹⁸⁶	Percentage
Direct labour <i>(Regiebetrieb)</i>	Operated by the municipality within the scope of the regular municipal administration;	1,3
Semi autonomous municipal agency <i>(Eigenbetrieb)</i>	Operated by the municipality in a separate capacity with independent bookkeeping;	36,7
Inter-Municipal Association <i>(Zweckverbände)</i>	Can be established by two or more municipalities (and other public law corporations or the Land); public-law corporation in a separate capacity with independent bookkeeping;	16,5
Water & Soil Management Association <i>(Wasser- und Boden Verband)</i>	Can be created as public law institutions specifically for water management purposes; self-governing consortia which may involve property owners, companies, public-law corporations and other interested parties;	3,9
Municipal Enterprise <i>(Kommunale Eigengesellschaft)</i>	Private entity company entirely in the hands of the municipality;	21,1
Public enterprise <i>(öffentliche Gesellschaft)</i>	Like the Municipal enterprise, but involving next to the municipality other public law corporations;	6,9
Delegation to a private enterprise <i>(Betriebsführungsmodell)</i>	The plant property belongs to the municipality, but the operations and any further management tasks are delegated to a private firm;	11,9
Operator Model <i>(Betreibermodell)</i>	Delegation of the plant operations to a private firm, whereas the responsibility of tasks remains with the municipality;	
Concession Agreement <i>(Konzessionsmodell)</i>	Delegation of water supply by a municipality to a private company; concession agreements with a duration of 20 years or more are the contractual basis;	1,7

Source: Quoted figures: BGW Water Statistics, 2000.

8.2.4.5. Associations of Municipalities, Water Suppliers and Standard-Settings

Municipal associations are also active in the sphere of water policy because of municipal responsibility for water supply and sewerage. The **Congress of German Cities** (*Deutscher Städtetag* - DST) represents 5,500 independent cities and towns that form part of rural

¹⁸⁵ In order of decreasing integration into municipal administration.

¹⁸⁶ For more detailed information, cf. BMU (2001e).

districts, while the **German Federation of Cities and Municipalities** (*Deutscher Städte- und Gemeindebund* - DStGB) acts for about 13,000 towns and villages that form part of rural districts.

The **Association of Municipal Enterprises** (*Verband kommunaler Unternehmen* - VKU), with its membership of municipal agencies and companies for water and energy supply, as well as transport, is active in issues of water supply and the provision of sewerage services.

With regard to economic, legal, technical and organisational aspects, the interests of gas and water supply agencies and companies before parliaments, governments, authorities, as well as the general public, are represented by the **Federal Association of German Gas and Water Industries** (*Bundesverband der deutschen Gas- und Wasserwirtschaft* - BGW). BGW's members consist of about 1,300 enterprises active in the supply of gas and/or water.

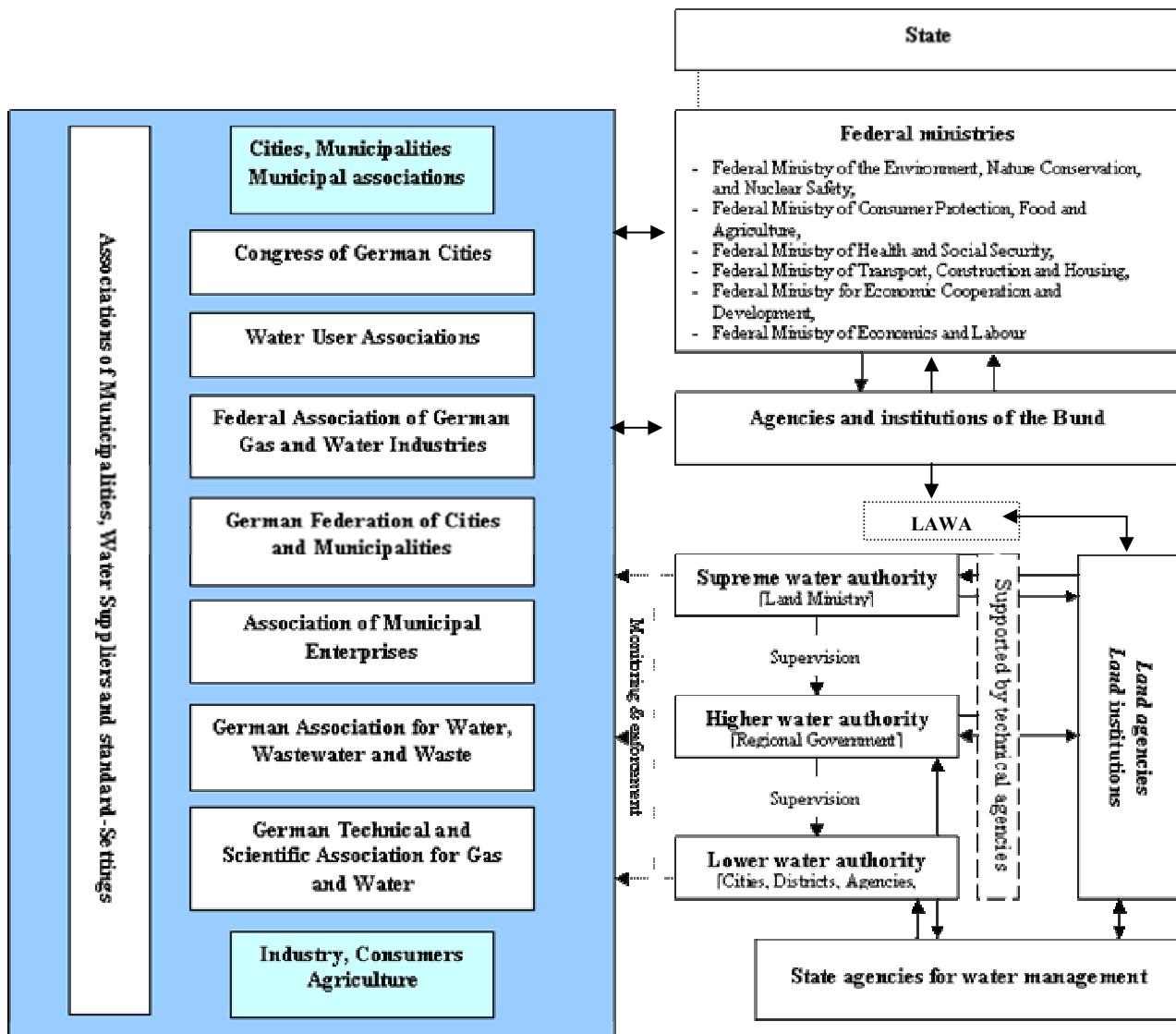
The most important standard-setting associations (*regelgebende Verbände*), which are all active at the federal level and often have regional groupings for the *Länder*, are in the following briefly presented: The **German Association for Water, Wastewater and Waste** (*Deutsche Vereinigung für Wasser, Abwasser und Abfall* – ATV-DVWK), with more than 16,000 members and sponsors, operates within the fields of water pollution control, wastewater, water-hazardous substances, waste, hydraulic engineering, hydropower, hydrology, soil conservation and the rehabilitation of contaminated sites.

With about 5,800 individual members, companies and authorities, the **German Technical and Scientific Association for Gas and Water** (Deutscher Vereinigung des Gas- und Wasserfaches - DVGW) is active in water and gas supply. The standard-setting associations not only contribute to the dissemination of expert knowledge, but they also have some influence over problem definitions and perception of water management issues.

The following figure gives an overview of the systematic structure for water management in Germany, detailing in particular the interplay of the different actors.



Figure 8-2: Actors in Water Management in Germany



8.2.5. Summary table

The following Table 8-3 summarises the information provided in this chapter and gives an overview of the historical phases by outlining the main legislative changes along with their underlying policy rationale.



Table 8-3: The History of Water Laws in Germany

Phase	Legislation	Content of the Legislation	Policy Rationale
Phase I: Until 1957 – Legislative Background	< 1957: Amalgamation of different Laws from the 19 th and 20 th century were in force > 1945 division into 2 German States (only BRD looked at in this review)		
Phase II: 1957 – 1963 Increasing drinking water quality through standards	1957: Federal Water Act (FWA) 1959: Drinking Water Treatment Ordinance	<i>Federal Water Act</i> : the basic law regulating activities in the water sector in Germany <i>Drinking Water Treatment Ordinance</i> : 1 st legal regulation to introduce a binding legal approach of quality standards for drinking water	<i>If we want to increase drinking water quality, consistent legally binding standards have to be established</i>
Phase III: 1964 – 1975 Increased monitoring of drinking water	1964: 2 nd Amendment of FWA 1967: 3 rd Amendment of FWA 1975: Federal Epidemics Water Act 1975: Drinking Water Ordinance	<i>2nd Amendment of FWA</i> : new regulations on handling hazardous substances to water <i>3rd Amendment of FWA</i> : extended FWA to coastal waters (in particular w.r.t. pollution control) <i>Federal Epidemics Water Act</i> : basis for the definition of legally binding requirements for drinking water quality <i>Drinking Water Ordinance</i> : concretised the Federal Epidemics Water Act and defined detailed quality standards for drinking water, monitoring and enforcement	<i>If we want to increase public health and prevent water-borne epidemics, then stricter quality standards with adequate monitoring and enforcement rules have to be introduced</i>
Phase IV: 1976 – 1985 Stronger regulation of discharges	1976: 4 th Amendment of FWA 1976: Effluent Charges Act	<i>4th Amendment of FWA</i> : extended the existing water quality regulations; requirements on discharges of wastewater into waters increased; requirements on installations handling hazardous substances increased; gave Länder the opportunity to transfer wastewater disposal to “third parties” (limited period and revocable contracts) <i>Effluent Charges Act</i> : first German Eco-tax at the federal level; the charge is incurred if effluent is discharged directly into water bodies; level of the charge is dependent on quantity and harmfulness of the discharge; lower rates are levied if the party liable to pay the charge satisfies a set of minimum standards; investments in improved waste water treatment can be set off against the payable charge	<i>If we intensify water treatment regulations and regulate discharges with respect to their harmfulness, then we will preserve the quality of our water bodies</i>
Phase V: 1986 – 1995 Improvements in water quality and integrated management	1986: 5 th Amendment of FWA 1991: Water Association Act 1986, 1990: 2 nd & 3 rd Amendment of	<i>5th Amendment of FWA</i> : new provisions regarding the discharge of hazardous substances into waters <i>Water Association Act</i> : allows for the establishment of water	<i>If we reduce harmful substances, decrease bacterial and chemical pollution and establish an integrated water management, then we will increase the water</i>



	<p>Effluent Charges Act 1994: 4th Amendment of Effluent Charges Act 1986, 1990: Drinking Water Ordinance</p>	<p>user associations (self-financing institutions used for the construction and finance of water infrastructure, allocation of services among users; promotion of co-operation between agriculture and water management, etc.) <i>2nd & 3rd Amendment of Effluent Charges Act:</i> aimed at increasing the incentive character of effluent charges; and at reducing the administrative effort of the charging process <i>4th Amendment of Effluent Charges Act:</i> extended the possibilities to write off investments for building new or upgrading existing treatment plants against the debts of payable charges <i>Drinking Water Ordinance:</i> commandment to decrease harmful chemical substances → implementation of the Drinking Water Directive 80/778/EEC</p>	<p><i>quality and preserve our water bodies</i></p>
Phase VI: 1996 – 2000 Improved Treatment of Discharges	<p>1996: 6th Amendment of FWA 1997: 1st Wastewater Ordinance 1998: 2nd Wastewater Ordinance</p>	<p><i>6th Amendment of FWA:</i> alteration to law on wastewater discharge related to: waterway engineering, flood protection, frequently flooded areas; technology involved with discharges has to be state-of-the-art <i>1st Wastewater Ordinance:</i> 1st measure to implement the 6th Amendment; regulates requirements for discharge of wastewater within scope of municipal handling of wastewater <i>2nd Wastewater Ordinance:</i> specific regulation for domestic wastewater and for various industries</p>	<p><i>If we intensify legally binding sewerage treatment regulations, then we will preserve the quality of our water bodies.</i></p>
Phase VII: – after 2000 Implementation of the WFD	<p>2002: 7th Amendment of the FWA 2001: Drinking Water Ordinance</p>	<p><i>7th Amendment of the FWA:</i> sets the scene for the implementation of the WFD in Germany; <i>Drinking Water Ordinance:</i> implements the Drinking Water Directive 98/83/EEC; streamlines parameters, point of use = point of compliance (“tap water directive”);</p>	<p><i>If we comply with European legislation, implement an integrated River Basin Management and achieve a good water status on River Basin scale, then we will improve the condition of the overall aquatic environment and achieve sustainable water management</i></p>

8.3. ANALYSIS OF THE LEGISLATION IN FORCE

With the historical evolution of legislation applying to the German water sector in mind, it is possible to investigate how the present legislative framework is applied towards the protection of water resources and the provision of services along the water cycle. For the purpose of the following analysis, the water sector is divided into three consecutive phases, namely resource access, water production and distribution, and sewerage collection and treatment. For each phase, the legislation in force, the relevant policy objectives, the available instruments and their target groups, and the actors of implementation are briefly introduced. Finally, the policy rationale and its effects are deduced.

8.3.1. Resource Access

Box 8-4: Legislation in Force on Resources Access

Federal Water Act (*Wasserhaushaltsgesetz*) of 2002

Land Water Acts (*Landeswassergesetze*)

Land Municipalities Act (*Gemeindeordnungen*)

Land Acts concerning Water Abstraction Charges (*Landesgesetze über Wasserentnahmeeentgelte*)

8.3.1.1. Property Rights over Water Resources

In Germany, the federal waterways are owned by the Federal Republic, while all other water bodies in the first class are owned by the *Land* in which they are situated. Other water bodies are owned by riparian land-owners, wholly owned by municipalities, or held under existing private ownership, depending on the water law of the respective *Land*. The question of ownership is, however, of secondary importance, as it does not confer the right to use, or to deny others the right to use, the water or to develop a water body. In particular, land ownership does not include the right to use ground water resources, except for those uses which are exempt from licensing procedures (Kraemer and Jäger, 1998).

One important aspect of water management in Germany is that water uses are prohibited unless a **permit** (*Erlaubnis*) or a **licence** (*Bewilligung*) has been granted by the competent authorities according to Articles 7 and 8 of the Federal Water Act.

The Federal Water Act (see section 8.2.3) allows for exemptions from the general requirement to obtain a licence or a permit with respect to the common use of surface waters (Article 23 WHG), coastal waters (Article 32a WHG) and groundwater (Article 33 WHG). Details are laid out in the *Land* water laws. Common uses usually include minor (recreational) use and the individual disposal of ground, spring or rainwater, as long as no other rights are infringed upon or certain other uses impaired. Similar rules exist for riparian use (Article 24 WHG) and fishing (Article 25 WHG).

8.3.1.2. Public Policies on Water Resources

Policy objective:

The objective of public policies on water resources can be summarised as: “effective water resource management in terms of water quality and quantity”, by maintaining or restoring the ecological balance of waters; providing protection against polluting substances (e.g. nitrates, hazardous substances, phosphorous, pesticides, etc.); as well as ensuring that water quality allows for all water uses serving the public welfare to continue to be possible at all times (UBA 2001).

Instruments:

The following instruments have been made operational in the context of achieving the objectives listed above:

Planning instruments

A number of planning instruments (e.g. local programmes of measures (e.g. for rectifying damages to the aquatic environment), management plans, development plans) have been made operational at the different administrative and basin levels.

Water protection areas

Water protection areas (*Wasserschutzgebiete*) have been established pursuant to Article 19 of the WHG. An obligation linked to their designation is to make information about restrictions (e.g. on fertiliser use) in protection areas available to the actors concerned as well as to the interested public.

Permits and licences for water use

The use of water requires either an official permit according to Articles 7 of the WHG or a licence pursuant to Article 8 WHG (with the exact legislative details regulating the issuance of a permit or licence depending on the *Land* water laws).

Both permits and licences may be refused or revoked in the following circumstances:

- Pursuant to Article 6 of the Federal Water Act, "*a permit or licence shall be refused if the proposed use is likely to be detrimental to the public interest and, especially, to endanger the public water supply, and where these adverse impacts cannot be prevented or compensated by the imposition of conditions or measures taken by a public corporation*".
- Pursuant to Article 12 of the Federal Water Act, "*[...] a licence may be revoked completely or in part, against payment of compensation, if the unrestricted continued use of water is likely to cause considerable impairment to the public interest, in particular the public water supply.*"

Water abstraction charge

Water abstraction charges (*Wasserentnahmehentgelte*) are instituted and operated on the basis of *Land* law (partly on the basis of clauses in *Land* Water Acts, partly on the basis of specific legislation) so that a variety of systems is operated in the different German *Bundesländer*: While the water abstraction charge of Baden-Wuerttemberg (BW) is levied on actual water

abstraction¹⁸⁷, a different scheme is applied in Hamburg by levying the charge on the quantity of water for which an abstraction permit has been granted. The regulatory framework of BW has been copied by many other German *Länder*.

Regulation related to pesticides, fertiliser use and manure spreading

Authorisation schemes have been made operational in order to control the use of substances hazardous to the aquatic environment, such as pesticides and *information* has to be provided on their use. Furthermore, regulations exist with regard to fertiliser use and manure spreading stipulating months and areas in which use is forbidden, along with allowed concentration levels.

Compensation payments

Compensation payments exist in some *Länder* that aim at fostering resource protection (e.g. compensation payments made to farmers that aim at encouraging the use of environmentally friendly farming techniques).

Monitoring

Water quality monitoring constitutes an important aspect of water resource management in Germany.

Target groups of the different instruments:

- Farmers, property owners, riparian owners and all other water users can be the target group of planning instruments.
- Within water protection areas, the owners and authorised users of land may be obliged to tolerate certain measures (including measures for monitoring water and soil).

¹⁸⁷ In BW, rebates up to 90 % are available for water-intensive agricultural, forestry, and industrial enterprises which might otherwise be affected in their competitive position. Similar rebates can be granted in the public interest.

- Users of water bodies, such as water supply enterprises, have to apply for a permit or license according to the Federal Water Act (in those cases where the use is not covered by the exemption regulations (minor uses)).
- Agriculture, forestry and industrial enterprises, as well as water supply companies, are the main target groups of water abstraction charges.

Actors of Implementation:

- The *Länder*, in co-operation with the Upper and Lower Water Authorities (see section 8.2.4.3), are responsible for water management planning as well as for authorisation, permitting and licensing and monitoring procedures according to the Federal Water Act.
- The German *Länder* are the implementing authority for water abstraction charges.

Rationale (overall approach):

If we protect wells from (diffuse) pollution and regulate water use through permission, then we will preserve our water resources for the production of drinking water.

Policy Outcomes:

Major achievements have been made over the past decades in terms of improvements in the ecological balance of water bodies. Through stringent protection policies, the compilation of data and information relevant for the management of water resources, as well as information policies aimed at changes in actor behaviour, a better water management basis and an enhanced ecological balance of water bodies could be achieved, with notable:

- Improvements in water quality;
- Increases in the number of water protection areas;
- Decreasing pollution levels from substances hazardous to waters.

The incentive function of some of the instruments for water resource protection contributed to these improvements. To give an example: When the water resource charge was proposed in Baden-Wuerttemberg in 1988, annual revenue of about 80 million Euro was projected

(Kraemer et. al 2003). This level was achieved in the first three years. Over the years, revenue has fallen and stabilised at around 70 million Euro due to lower abstraction levels.

8.3.1.3. Water Production and Distribution

Box 8-5: Legislation in Force on Water Production and Distribution

Federal Water Act (*Wasserhaushaltsgesetz*) of 2002

Land Water Acts (*Landeswassergesetze*)

Land Municipalities Act (*Gemeindeordnungen*)

Water Association Act (*Wasserverbandsgesetz*) of 1991

Land Acts concerning Water Abstraction Taxes (*Landesgesetze über Wasserentnahmeeentgelte*)

Municipal Charges Laws (*Kommunalabgabengesetze*)

Infection Protection Act (*Infektionsschutzgesetz*) of 2000

Food and Utility Articles Act (*Lebensmittel- und Bedarfsgegenständegesetz*) of 1997

Drinking Water Ordinance (*Trinkwasserverordnung*) of 2001

Policy objective:

The policy objective with regard to water production and distribution is to guarantee a sustainable and stable public supply of high quality drinking water for a large range of water use(r)s through quality standards and controls, charges and licences, monitoring and transparent public information policies.

Instruments:

The following instruments have been put in place in order to achieve these objectives in the area of water production and distribution:

Water price

In Germany, the water price payable by the consumer is mainly based on metered water consumption (all houses connected to the public water supply system are equipped with a

water meter¹⁸⁸), but also contains fixed elements (e.g. related to the costs of water purification and network maintenance). It is set in accordance with the principle of cost-recovery (town councils usually set rates). Water supply services are not exempted from value added tax (VAT), which is thus included in the water price.

Quality standards, monitoring and sanctions against non-compliance

According to the Drinking Water Ordinance, high quality standards apply to water intended for human use with regard to its distribution, collection and processing. Furthermore, the Drinking Water Ordinance stipulates that regular monitoring has to take place, and also contains the possibility of sanctions against non-compliance with the standards set out in the ordinance¹⁸⁹.

Self-regulatory technical quality standards are established by the DVGW¹⁹⁰ (cf. section 8.2.4.5), to which water supply companies have to adhere.

Public information policy

Information about the quality of drinking water has to be provided and made available to the public by water supply companies. Furthermore, information is provided by the local health authorities.

Alert systems (and emergency plans) for informing the population in case of severe irregularities in drinking water quality (e.g. due to accidents) have to be made operational.

Licensing procedures

Article 19a WHG sets out licensing procedures relating to the installation of pipelines that are intended for the conveyance of substances hazardous to water.

¹⁸⁸ Cf. BGW 2000.

¹⁸⁹ In order to prevent the exhaustion of the determined limit values, the Drinking Water Ordinance contained the commandment to minimise harmful chemical substances (the so-called “Minimierungsgebot”).

¹⁹⁰ Deutscher Vereinigung des Gas- und Wasseraufschlusses (German Technical and Scientific Association for Gas and Water).

Subsidies:

Generally, a no-subsidisation approach is being followed in the area of water production and distribution in Germany, in accordance with the principle of the recovery of costs of water service provision.

Target groups of the different instruments:

- Since the Drinking Water Ordinance defined the point of use as the point of compliance with quality standards (cf. section 0), house owners and water supply enterprises are the main target groups of drinking water quality standards.
- Water supply companies have to comply with the DVGW technical quality standards.
- Consumers of drinking water have to be informed about the quality of drinking water.
- All consumer of water, such as households, industries and farmers, are charged for water purification, water service provision and network maintenance.

Actors of Implementation:

- The provision of water services (including water purification and network maintenance) is the responsibility of the municipalities.
- The *Länder*, in co-operation with the Upper and Lower Water Authorities, are the implementation authorities for permitting and licensing procedures according to the Federal Water Act.
- Informing consumers about drinking water quality underlies the responsibility of water supply companies.
- Local health authorities (*Gesundheitsämter*) are responsible for the control of drinking water quality.
- Charges for water purification, water service provision and network maintenance are established under the framework of the Municipal Charges Law (*Kommunalabgabengesetz, KAG*) and levied by the community-owned utility or mixed enterprise, but not by

private operators. Private companies must set prices according to private law. However, these, too, are often set according to the KAG formulae.

Policy rationale:

If we want to guarantee stable drinking water supply at high quality and to improve public health, legally binding standards along with adequate monitoring and enforcement mechanisms have to be established.

Policy Outcomes:

Around 98% of the population in Germany is currently connected up to the public water supply system, to which a high level of drinking water quality is universally attested. As public drinking water services are governed by the principle of cost recovery, water companies must ensure that water prices cover the costs of supply (customers pay for their consumption levels (user-pays principle), and tariffs are determined by the cost structure).

A change in the behaviour of the average consumer in Germany could be observed over the last decade (1990-2000), with a decrease in per capita water consumption of about 19%, to about 129 litres per day in 2000.

8.3.2. Sewerage Collection and Treatment

Box 8-6: Legislation in Force on Sewerage Collection and Treatment

Federal Water Act (*Wasserhaushaltsgesetz*) of 2002

Land Water Acts (*Landeswassergesetze*)

Land Municipalities Act (*Gemeindeordnungen*)

Effluent Charges Act (*Abwasserabgabengesetz*) of 1994

Land Effluent Charges Acts (*Landesabwasserabgabengesetze*)

Municipal Charges Laws (*Kommunalabgabengesetze*)

Wastewater Ordinance (*Abwasserverordnung*) of 2002

Sewage Sludge Ordinance (*Klärschlammverordnung*) of 1992

Policy objective:

The policy objective with regard to sewerage service provision is to guarantee sewerage disposal and treatment for a high range of sewerage producers in order to maintain adequate living conditions for the local population.

Instruments:

The following instruments have been put into practice in order to achieve the objectives outlined above:

Sewerage charge

Sewerage charges are payable for the discharges of water to the sewer and for the service of sewerage treatment. The charges are generally based on metered freshwater consumption, but municipalities are also free to collect fixed contributions regularly¹⁹¹. The collection of sewerage charges is set in the Municipal Charges Law (*Kommunalabgabengesetz, KAG*) of the various federal *Länder* on the principle of cost-recovery: the revenues collected by a particular community may not exceed the actual costs of the sewerage services provided, and conversely, the charges should be set at such a level that no deficit arises.

Discharge permit

A permit has to be obtained for all direct discharges into natural waters. In order to be granted a permit, national minimum requirements in accordance with BAT have to be met¹⁹². Furthermore, the environmental quality of receiving waters plays a complementary role in setting the conditions for permits.

¹⁹¹ In general municipalities are able to finance their investments in sewerage systems and operational cost through revenues from contributions and sewerage charges. A legal right to state or federal government subsidies does not exist (Kraemer et. al. 2003).

¹⁹² Since 1996, national minimum requirements for all discharges are set on the basis of BAT (Hansen et al, 2001).

Effluent charges

Effluent charges are levied on direct discharge of effluents into natural waters. The charges contain an incentive element, as they decrease in case of compliance with the relevant standards, or if the monitored values are lower than stated in the permit. The revenue from the charge is earmarked to finance, among other things, the building and operation of wastewater treatment plants.

Quality standards

For discharges of wastewater into waters, quality standards are laid out in the Wastewater Ordinance. Technical quality standards, with which service providing enterprises have to comply, are established by the ATV-DVWK¹⁹³ (cf. section 8.2.4.5).

Monitoring

According to *Länder* regulations, dischargers have to self-monitor their discharges. Backup control is exerted through official monitoring in order to guarantee compliance with the standards and the values stated in the permit of dischargers (see above).

Regulations related to sewerage sludge

The application of sewage sludge is regulated via the Sewage Sludge Ordinance, which stipulates the exact conditions (e.g. months and concentration levels) under which the application of sludge is allowed.

Subsidies

In some German *Länder*, subsidies for the establishment of treatment infrastructure continue to exist, although they have strongly decreased in magnitude and importance (fading out). As sewerage collection and treatment are considered sovereign services in Germany, no VAT is charged for its provision (cf. also debate below in Chapter 8.4).

¹⁹³ Deutsche Vereinigung für Wasser, Abwasser und Abfall (German Association for Water, Wastewater and Waste).

Target groups of the different instruments:

- Waste water producers from the source categories listed in the currently 57 appendices¹⁹⁴ of the Wastewater Ordinance have to comply with the minimum requirements in order to be granted a permit for the discharge of waste water into natural water bodies.
- Sewage treatment companies have to comply with the ATV-DVWK technical quality standards.
- Households are the target group of sewerage charges.
- Industrial plants of all sizes with any quantity of (direct) discharges are subject to effluent charges¹⁹⁵; sewerage treatment plants are equally liable to the effluent charging scheme, and no reductions or exceptions apply to them.

Actors of Implementation:

- The provision of sewage services (including sewage treatment and network maintenance) is the responsibility of the municipalities.
- Municipalities collect sewerage charges.
- The issuance of permits for effluent discharges is under the responsibility of the *Länder*.
- The permit-issuing water authorities of the *Länder* are responsible for inspecting and monitoring the water quality of receiving waters.
- Where existing waste water discharges do not comply with the requirements pursuant to the Waste Water Ordinance, the *Länder* shall ensure that the necessary measures are carried out within appropriate periods of time.

¹⁹⁴ Such as domestic and communal wastewater, milk processing, production of fruit and vegetables products, meat industry etc.

¹⁹⁵ The definition of direct discharger includes industrial effluents, agricultural discharges and discharges from sewage treatment plants (SWP) and from landfills as well as direct rainwater discharges.

- As the *Länder* are the competent authorities for water management and legislation, they are the recipient authorities and are responsible for collecting effluent charges. They may also delegate the collection of charges to the municipalities.

Rationale (overall approach):

If we want to maintain adequate living conditions with high sanitation standards for the population, sewerage disposal and treatment have to be guaranteed.

Policy Outcomes:

In 1998, only 6.8% of Germany's population was not connected to a public sewer system. With a 93.2% connection rate, one can speak of a practically complete sewer system in Germany (BMU and UBA, 2001b)¹⁹⁶. The predominant amount of wastewater (99.5%) was treated in public wastewater treatment plans. Point source discharges without any treatment were reduced from about 115 million m³ in 1995 to about 65.3 million m³ in 1998 (BMU and UBA, 2001b). Revenue obtained through effluent charges is earmarked for a range of water management activities, such as investments in water pollution control and cost coverage for other quality improvement measures. Revenue is thus used to maintain and improve water quality and also fulfils a financing function.

8.3.3. *Synthesis*

8.3.3.1. *Table for the Comparison*

The following table provides a summary of the instruments applied, the target groups, as well as the implementing actors as described above.

¹⁹⁶ One should bear in mind that decentralised solutions, which are not connected to the public system, can provide a more cost-effective solution, and a connection rate of 100% therefore is not necessarily to be aimed at.



Table 8-4: Synthesis - Germany

Public policy Water cycle	Objectives	Instruments (regulations, incentives, information, self-regulation)	Target groups	Actors of implementation
1. Resource Access	Resource management in terms of water quality and quantity	<p><i>Reg.</i> Planning instruments, e.g. River Basin Management Plans, water protection areas (protection perimeters around wells) <i>Inc.</i> Permitting and licensing procedures for water uses Monitoring programmes Water abstraction taxes Financing of quality improvement measures and water pollution control with the revenue from effluent charges</p>	Farmers, property owners and all riparian owners Agriculture, forestry and industrial enterprises User of water bodies	<i>Länder</i>
2. Water Production and Distribution	Guaranteed and sustainable public supply of good quality drinking water for a high range of water users	<p><i>Reg.</i> Legal requirements according to Article 28 of the German Basic Law Licensing procedure for pipeline installations for conveyance of substances hazardous to waters High quality standards of drinking water Technical quality standards of Standard-setting Associations Water abstraction tax Charges for water service provision (including water purification and network maintenance) <i>Inf.</i> Consumer informed of the quality of drinking water</p>	House owners and water supply enterprises Agriculture, forestry and industrial enterprises User / consumer of water such as households, industries, farmers etc. Consumer of drinking water	Municipalities Local health authorities <i>Länder</i> with Lower and Upper Water Authorities Community owned utility or mixed enterprises
3. Sewerage Collection and Treatment	Guaranteed sewerage disposal and treatment for a high range of sewerage producers in order to maintain adequate living conditions for the local population	<p><i>Reg.</i> Legal requirements according to Article 28 of the German Basic Law Quality standards for discharges of wastewater in waters and for application of sewage sludge Technical quality standards of Standard-setting Associations Charges for wastewater services provisions (including sewage treatment and network maintenance) <i>Inc.</i> Effluent charges</p>	Waste water treatment enterprises Waste water producer when discharging waste water in waters Waste water producer such as households, industries, farmers etc. Industrial plants with discharges of waste water in waters	<i>Länder</i> Lower and Upper Water Authorities Municipalities

8.3.3.2. Main Characteristics of the National Model

The following characteristics are key to the German system of water management and describe the typicality of the “German Model”:

- The organisational structure of water management in Germany is characterised by local self-administration, with water supply and wastewater disposal under the responsibility of the local municipalities (*Daseinsvorsorge*), resulting in a highly decentralised system with about 14,600 enterprises.
- The competition between different organisational regimes (*Systemwettbewerb*) constitutes a further important feature of the German system: municipalities can choose between a variety of organisational arrangements for providing water and sewerage services to their customers (see also see Table 8-2).
- Furthermore, strong vertical competition (in supplying markets) is characteristic of the German system (*Vorleistungsmärkte*).
- On the technical side, the German water sector has become known for its high standards, which translate into a stable and efficient high quality service, of which the system’s low leakage rate is but one indicator.
- The management of water resources and the provision of water services is conducted under the guiding notion of sustainability, which manifests itself in the application of the following key principles:
 - The *precautionary principle* implies that potentially harmful activities have to be abandoned even if their probability of occurrence is minimal.
 - The *polluter-pays principle* states that those causing damage (e.g. pollution, over-intensive use, etc.) to the aquatic environment should bear the costs of its rectification.
 - The *co-operation and participation principle* captures the issues of democratic control and local co-determination: the wider picture has to be taken into

account, and all actors concerned or affected by a decision have to be consulted and involved into the decision-making process.

- The *integration principle* stipulates that water management should not be conducted in isolation; instead, an integrated approach taking account of environmental, social and economic considerations should be followed.
- The *region principle (Regionalitätsprinzip)* and the *principle of local provision* imply that each region should as far as possible resolve its water related problems while making use of its own resources.
- The *resource minimisation principle* states that as little influence as possible should be exerted on the water resource; the use of resources should be minimal; and that water uses should shift away from non-renewable to renewable resources.
- The *inter-generation principle* takes account of the fact that water management decisions may have long term repercussions. Therefore, the interests of future generations have to be taken into consideration in the decision making process.
- The *reversibility principle* states on the one hand that water management activities should generally be conducted in a way that allows for their reversal at a later stage (i.e. should they bear negative consequences), and on the other hand that the possibility and necessity of adjustments of measures / activities to changing circumstances should be taken into account from the beginning.

In essence, the "German model" can be summarised as **system diversity with a strong position of municipalities and vertical competition**, guided by the notion of sustainable water management.

8.4. FUTURE TRENDS IN WATER PLANNING AND MANAGEMENT

Over the past years, discussions on the privatisation and liberalisation of the German water and sewerage sector came to a head, caused by reports on the supposedly inefficient structure of water supply and sewage disposal in Germany. These discussions were linked to the liberalisation of other infrastructure industries (i.e. the electricity, gas, telecommunication and transport sectors). A number of conferences, advisory opinions and studies stimulated the debate and aimed at analysing the involved risks as well as potential opportunities that might be connected with liberalisation¹⁹⁷.

By the technical-scientific arguments evolving from this process, the overall discussion in Germany has been pushed towards the conclusion that liberalisation in the style of the electricity and gas industries is not possible in the water supply sector. A general understanding has been reached that the optimisation and efficiency gains aimed at through liberalisation can also be obtained through reform, i.e. modernisation of the present system. Therefore, the German Parliament initiated a working group under the lead of the Federal Ministry of Economics and Labour, which is currently working on a strategy for modernising the water supply and sewerage disposal sector (the so called ***modernisation strategy***)¹⁹⁸. Within this strategy, e.g. an equal fiscal treatment of water supply and wastewater service provision is being investigated, in order to facilitate economies of scale in this area¹⁹⁹. Furthermore, possible ways in which the use of benchmarking methods could be further strengthened in order to demonstrate and improve the performance of German water and sewage companies are discussed within the framework of this strategy formulating process

¹⁹⁷ In addition to the expert opinion about "Options, chances and general framework of opening the market for a sustainable water supply" for the Federal Ministry of Economics (Ewers et al., 2001), the Federal Environmental Agency published in November 2000 a study with the title "Liberalisation of the German water supply sector - Effects on health and environmental protection" (UBA, 2000) that should be referred to in this context.

¹⁹⁸ The modernisation strategy implements the decision of the German Bundestag "Sustainable water management in Germany" of 21 March 2002.

¹⁹⁹ Currently, the joint provision of these services is hampered by unequal fiscal treatment (water supply is subject to a VAT rate of 7% independent of the organisational form of the service provider (public or with private involvement), while sewerage services are considered as a sovereign service which is not liable to VAT, if it is provided by the municipality without the involvement of a third (private) party. In the case of the provision of sewerage services through an organisational arrangement under private law, the full VAT rate of 16% is applied).



(Kraemer et al., 2002). Box 8-7 outlines the different aspects of the currently formulated modernisation strategy in greater detail.

*Box 8-7: The national modernisation strategy (*Modernisierungsstrategie*)*

Within the framework of the modernisation strategy for the German water sector, which was initiated by the German Parliament and is now being formulated under the lead of the Federal Ministry for Economy and Labour in co-operation with other ministries, the LAWA, associations, municipalities and the water industry, the following main elements are being discussed:

Introduction of a transparent **benchmarking system** based on well-defined and objective indicators (including also environmental indicators). For the time being, benchmarking is only practised on a voluntary and not area-wide basis in Germany²⁰⁰.

Strengthening **municipal co-operation**, in order to achieve efficiency gains and allow for synergy effects to develop.

Annulment of the **unequal fiscal treatment of water and sewage**, which currently hinders the formation of multi-utility enterprises.

Relaxation or annulment of the **principle of locality** (*Ortlichkeitsprinzip*).

Strengthening of the **minimisation principle**.

Increased **information provision to municipalities** on the implications of privatisation.

Export promotion of the German water industry.

A further trend of growing importance is that an increasing number of municipal water service companies sell their shares to private companies, often without having a clear strategy for the future of their water and wastewater service provision (i.e. should the private company discontinue its involvement after a longer period of time, the responsibility for the service provision is transferred back to the municipality, which might pose significant challenges to municipalities, if they have not been involved in the provision for years). Particularly with regard to this ongoing privatisation process, it is considered necessary to formulate proposals detailing in which way the existing framework of the German water sector will have to be adapted (Hansen et al., 2000). Proposals should concentrate on the general conditions for privatisation in terms of the protection of the population, as well as on providing municipal

²⁰⁰ As an example for voluntary benchmarking, the VKU (see section 8.2.4.5) conducts a comparison of the performance of participating municipal enterprises on a yearly basis, by looking at key financial and technical data. However, the obtained results are strictly confidential and only distributed among the participating enterprises in anonymous format (as a publication of these sensitive data is considered as having potentially detrimental effects for the participating enterprises). While some actors favour this form of voluntary and anonymous benchmarking, others stress the need for a more open approach.

support related to an appropriate regulatory framework and qualified advice (Hansen et al., 2000).

8.5. CONCLUSION

This report analysed the historical development of the German water sector over the past 100 years, including its legislative requirements and regulations, the sectoral organisation, as well as the underlying policy rationales. It highlighted the main actors and stakeholders involved in the German water cycle and detailed their frame of action. Furthermore, the instruments currently in place for water management, their target groups and implementing actors have been detailed. The description and analysis of the German water sector has led to its characterisation as “system diversity with a strong position of municipalities and vertical competition, guided by the notion of sustainable water management”. The final discussion of the present status of debate on the issue of liberalisation of the water and sanitation sector in Germany has made clear that liberalisation is no longer considered an option in Germany: Rather, a modernisation of the present system is being strived for. The national modernisation strategy, which is currently being formulated in reaction to this understanding, constitutes the most important development in this context. Its outcome is expected for spring 2004 and will largely determine the further developments in the water sector in Germany.

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9. CHAPTER 9: COUNTRY REPORT UNITED KINGDOM

BRITTA PIELEN, NADINE HERBKE AND EDUARD INTERWIES²⁰¹

ABBREVIATIONS

CC	Competition Commission
CCC	Consumer Consultative Committees
CSC	Customer Services Committees (now WaterVoice Committees)
DEFRA	Department for Environment, Food and Rural Affairs
DETR	Department of the Environment Transport and the Regions (now DEFRA)
DIW	Drinking Water Inspectorate
DoE	Department of the Environment (then DETR, now DEFRA)
DOE	Department of the Environment in Northern Ireland
EA	Environment Agency
EHS	Environment and Heritage Services (Northern Ireland)
MAFF	Ministry of Agriculture, Fisheries and Food
M&A	Mergers and Acquisitions
NAW	National Assembly for Wales
NGO	Non-governmental organisation
NI	Northern Ireland
NRA	National River Authorities
OFWAT	Office of Water Services
ONCC	OFWAT National Customer Council (now WaterVoice Council)
PCV	Prescribed concentration or values
RIA	Regulatory Impact Assessment
RV	Rateable value
RWAs	Regional Water Authorities

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SEPA	Scottish Environment Protection Agency
STP	Sewerage Treatment Plant
UK	United Kingdom
WaSCs	Water and Sewerage Companies
SWCs	Statutory Water Companies
WoCs	Water only Companies

9.1. INTRODUCTION



The path of development of the water sector in the United Kingdom (UK) is unique within Europe: in 1989, the provision of water services in England and Wales was privatised, and statutory undertakers are now responsible for the abstraction, production and distribution of drinking water and the collection and treatment of wastewater. The evolution of the accompanying regulatory and administrative framework, as well as of consumer representation, provides an interesting example. Therefore, the case of the United Kingdom has been selected as one

of the national case studies within work package 4 of the Euromarket project, which is investigating the evolution of water related legislation and sector organisation across EU Member States²⁰².

In order to understand the evolution of the UK's water sector into its present institutional set-up, a few basic facts on the nation's geographical and historical background serve as a good starting point.

²⁰² Euromarket is a research project on 'Water liberalisation scenarios: An empirical analysis of the evolution of the European water supply and sanitation sectors. The project is funded by the European Union under the "Energy, Environment and Sustainable Development" programme of the 5th RTD Framework Programme as well as by the Swiss Federal Office for Education and Science. More detailed information on the project has been made available at the project's web-site: <http://mir.epfl.ch/euromarket>.



The territory of the United Kingdom covers 244,110 km², of which England makes up the largest and most populous division, with 130,410 km²; Scotland is second in size, with an area of 78,790 km²; Wales has an area of 20,760 km²; and the area of Northern Ireland is 14,160 km². The population density of Britain is one of the highest in the world, with on average 244 persons per km² (2003)²⁰³. However, it varies greatly across ‘countries’²⁰⁴ and regions: While England has an average population density of 389 inhabitants per square kilometre²⁰⁵, this compares to a figure of 119 for Northern Ireland²⁰⁶. Furthermore, Britain’s population is highly urbanised, with 89.4% living in villages, towns and cities of at least 1000 people, and only 10.6% living in rural areas (Green, 2003).

Britain can broadly be divided into two major natural regions, namely the highland (north and west) and the lowland zone (south and east). The highland zone, in which Wales, Scotland, and parts of England are located, consists to a large extent of hills, mountains and eroded areas, and in many places farming is impossible. The lowland zone is characterised by great plains and large areas of almost-level ground. It rains less in this zone, and the area receives more sunshine, making it more fertile and apt for cultivation. The capital, London, and most of Britain’s larger cities are located in the lowland zone.

Britain’s soil use varies greatly. While 77% of the land in Britain is used for agriculture, only 24% of this land is used to grow crops, with almost all of the rest being used as grazing land. Today, only 10.7% of the UK is forested, making up for roughly 3 million hectares²⁰⁷.

Rivers and lakes are numerous in Britain. The Thames (338 km) and the Severn (290 km) are the longest rivers in Britain. Other important rivers in England are the Mersey, the River Humber on the east coast, and the Tyne River in northern England. In Scotland, the important rivers are the Clyde and the Forth; and in Northern Ireland, these are the Lagan, the Bann, and

²⁰³ Cf. National Statistics [<http://www.statistics.gov.uk/>].

²⁰⁴ In this context, the term ‘country’ refers to the separate entities of England, Wales, Scotland and Northern Ireland.

²⁰⁵ Scotland possesses 5,062,011 people, and a population density of 65 persons per km². Wales has 2,903,085 people, with a population density of 141 persons per km². Northern Ireland’s population is 1,685,267, and it has 119 persons per km² (Weisser, H.G. and M. Kishlansky, 2004).

²⁰⁶ Cf. Weisser, H.G. and M. Kishlansky, 2004.

²⁰⁷ In contrast, 25 percent of Europe is forested. Only 8 percent of England is covered by forest, 15 percent of Scotland, 12 percent of Wales, and 6 percent of Northern Ireland (Weisser, H.G. and M. Kishlansky, 2004).

the Foyle²⁰⁸. Most of the large lakes in the United Kingdom are located in the upland areas of Scotland and northern England, although Lough Neagh in Northern Ireland is the largest lake in the United Kingdom. Furthermore, it is worth noticing that the United Kingdom includes a number of small islands off England's southern coast, to the west and north-east of Scotland, in the English Channel and off the north-west coast of Wales.

With this basic information on the geographical and water resource conditions of the UK in mind, this report gives an overview on:

- How the water sector developed over the past 100 years, including legislative requirements and regulations, sectoral organisation, as well as the underlying policy rationale;
- The main actors and stakeholders involved in the UK water sector;
- How UK legislation has been influenced by EU directives;
- The present status of the debate on the issue of liberalisation of the water and sanitation sector in the UK.

In tackling these issues, the report first gives an overview of the legislative and regulatory aspects of the water and wastewater sector of the UK. To this end, the water sector is placed within the general institutional context of Britain, followed by an historical overview of the evolution of legislation in the field of water management and water service provision (Chapter 2). Chapter 3 then turns to outlining the policy instruments applied along the different stages of the water cycle, the instruments' target groups and implementing actors, and finally the outcome and effects of these policies. Chapter 4 briefly summarises the present status of the debate on the issue of liberalisation of water and sanitation service provision in the England and Wales. Chapter 5 finally presents the reports conclusion.

As the development of the water sector in England and Wales is of particular importance and interest to the Euromarket project due to its unique path of development within the European Union, the following discussion will concentrate on the situation in England and Wales.

²⁰⁸

See Environment Agency Website, [<http://www.environment-agency.gov.uk>].



Nevertheless, reference will be made to the institutional arrangements in Scotland and Northern Ireland whenever deemed necessary in order to indicate principal differences in the systems operated in these countries.

9.2. GENERAL FRAMEWORK FOR WATER MANAGEMENT

9.2.1. *Institutional Framework*

The United Kingdom (UK) comprises the four ‘countries’ England, Wales, Scotland and Northern Ireland and is administrated via a single central government (see below) which operates through Departments and Geographical Offices (Rees and Zabel, 1998). In 1997 and 1998, referenda held in Scotland, Wales and Northern Ireland on how those countries and regions should be governed decided in favour of devolution. As a result, elections for a new Scottish Parliament, National Assembly Wales and Northern Ireland Assembly were held, and some power was formally transferred from the UK Government to the devolved administrations in Scotland, Wales and Northern Ireland in 1999 (see below).

Parliament is the highest legislative authority in the UK, and is the institution responsible for making and repealing UK law. The **UK Parliament** (also known as the Legislature) consists of three constituent parts: the House of Commons²⁰⁹, the House of Lords²¹⁰ and the Crown²¹¹. These three parts all have to be consulted before a new law can be passed. The House of Commons and the House of Lords scrutinise the work of the UK Government in debates and

²⁰⁹ The members of the **House of Commons** are democratically elected (by citizens above the age of 18) and it constitutes the source of real political power in the UK.

²¹⁰ The members of the **House of Lords** are not elected: It comprises the lords temporal (either hereditary peers or life peers, i.e. appointed by the monarch for the duration of the person’s lifetime), the lords spiritual (including the archbishops of Canterbury and York; the bishops of London, Durham, and Winchester; and the 21 next most senior bishops), and the law lords (who assist in the judicial functions of the House of Lords). The House of Lords has the power to introduce bills (except for bills dealing with financial matters); offer amendments to bills passed by the House of Commons; and to delay legislation (e.g. the House of Lords may delay bills for up to one year (except financial bills)).

²¹¹ The **Crown** or the Monarch is the official head of state and formally summons and dismisses Parliament and the Cabinet ministers. Formally, he or she also is head of the judiciary; commander in chief of the armed forces; Supreme Governor of the Church of England and the Church of Scotland; appoints all judges, military officers, diplomats, and archbishops; and bestows honours and awards (e.g. knighthood and peerage). However, in reality, these functions and duties are carried out by the government or made upon the advice of the prime minister.

parliamentary questions and through committees of inquiry known as Select Committees. The **UK Government** (also known as the Executive) is the institution that governs the country. The Government formulates policies and introduces legislation in Parliament. Members of the Government are usually either members of the House of Commons or of the House of Lords²¹².

In **England**, water management is the responsibility of the Department for the Environment, Food and Rural Affairs (DEFRA, see section 9.2.4.1) in collaboration with three regulatory institutions (see below).

In Wales, most of the powers and responsibilities of the **Welsh Office**²¹³, including almost all of the Secretary of State's functions, such as water issues, were transferred to the **National Assembly for Wales** (NAW). The NAW has statutory and policy responsibility for matters related to the Welsh water industry (see section 9.2.4.1)²¹⁴. The Cabinet is the main decision-making body within the Assembly. As a member of the Cabinet, the Minister for Environment, Planning and Countryside is accountable for the aquatic environment in Wales. The **Wales Office** came into being on 1 July 1999 as the successor to the Welsh Office. The **Secretary of State for Wales** is the key Government figure liaising with the devolved administration in Wales, and he represents Wales' interests in the UK Cabinet²¹⁵.

The administrative arrangements for water management are the same in **England and Wales**, with private water companies and national regulatory authorities. In the context of privatisation (described in greater detail below), three regulatory authorities were created: the Office of Water Services (Ofwat), to set the price regime that companies follow; the Drinking Water Inspectorate (DWI), for monitoring water quality; and the Environment Agency (EA), for monitoring river and environmental pollution (see Section 9.2.4.2).

²¹² See United Kingdom Parliament Website, [<http://www.parliament.uk/index>].

²¹³ The Welsh Office itself was set up in 1964 and progressively assumed powers from a number of Whitehall Departments - Education and Training, Health, Trade and Industry, Environment and Transport and Agriculture.

²¹⁴ The National Assembly of Wales was established under the Government of Wales Act 1998, see NAW Website, [<http://www.wales.gov.uk/index.htm>].

²¹⁵ See Wales Office Website, [<http://www.ossw.wales.gov.uk/>].

Like the UK Parliament, the **Scottish Parliament** passes laws in **Scotland**. It also examines the work and policies of the **Scottish Executive**²¹⁶. The Scottish Executive is the government in Scotland for all devolved matters. At Devolution (see above), the powers and duties exercised by UK Ministers in Scotland that related to devolved matters were transferred to the Scottish Ministers. Most of the responsibilities previously held by the **Scottish Office** have become part of the remit of the Scottish Executive. The **Secretary of State for Scotland** represents Scottish interests within the UK Cabinet. Like the EA in England and Wales, the Scottish Environment Protection Agency (SEPA) is responsible for the protection of the aquatic environment in Scotland (see section 0). In Scotland, water and wastewater services are currently provided by Scottish Water, a public sector model within the UK water industry (for details, see section 9.2.4.5).

The **Northern Ireland Assembly** established as part of the Belfast Agreement²¹⁷ has full legislative and executive authority over all matters that are the responsibility of the Northern Ireland Government Departments²¹⁸. Within the **Northern Ireland Executive**, the Department of Environment in Northern Ireland (DOE) is the competent government department for protecting, conserving and enhancing the aquatic environment (including water service provision) in Northern Ireland. The **Secretary of State for Northern Ireland** represents Northern Ireland's interests in the UK Cabinet.

9.2.2. Resource Status and Resource Use

Contrary to many other EU countries, the bulk of water abstractions in the United Kingdom (around 70%) is made from surface waters, with only 30% being made from groundwaters. Figure 9-1Figure 9-1: Estimated Abstractions by Purpose in England & Wales (2000)

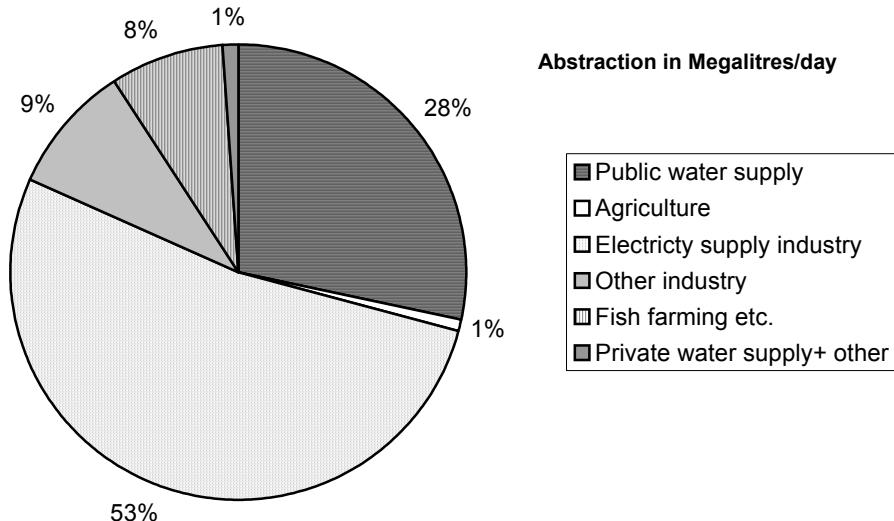
²¹⁶ Both were established under the Scotland Act 1998.

²¹⁷ The Belfast Agreement was endorsed through a referendum held on 22 May 1998 and subsequently given legal force through the Northern Ireland Act 1998.

²¹⁸ See NI Assembly and Executive Website, [<http://www.ni-assembly.gov.uk/>] and [<http://www.nics.gov.uk/>].

presents the estimated abstractions from all surface and groundwaters by purpose. In 2000, about half of the total amount of water (53%) was used by the electricity supply industry, followed by the public water supply, which amounted to 28%. Agricultural consumption is remarkably low, with 0.74% (2000). However, during the dry summer months, when the water level of rivers is low and the available water quantity is limited, water is needed for agricultural purposes. Therefore, during these months, agriculture may contribute considerably to regional water scarcity (Schönbäck et al., 2003a).

Figure 9-1: Estimated Abstractions by Purpose in England & Wales (2000)



* Some regions report licensed and actual abstractions for financial rather than calendar years. As figures represent an average for the whole year expressed in daily amounts, differences between amounts reported for financial and calendar years are small.

Note: Both surface and groundwater abstractions are considered. Private water supply contains private abstractions for domestic use by individual households. "Other" includes some private domestic water supply wells and boreholes, public water supply transfer licences and frost protection use.

Source: DEFRA, 2002b: Table 3.23a.

Box 9-1 provides key figures on the water and sanitation sector in the United Kingdom: In 1999, more than 99% of the population was connected to the water services systems. Furthermore, there are 100,000 private wells, with only 200 of them serving more than 500

people with drinking water. At present, about 96% of the UK population is connected to sewers leading to sewerage treatment plants²¹⁹ (DEFRA, 2002a).

Box 9-1: Key figures for Water and Sewerage Service in UK

Population served by water services in 1999	> 99 %
Water	
Water treatment works in 1999	> 2,500
Service / water towers in 1999	6,919
Private wells in water services	100,000
Total length of the water main	398,000 km
Sewerage	
Population connected to sewerage system	96%*
Average volume of wastewater	14,000 megalitres/day
Wastewater treatment plants in 1999	9,260
Total length of the sewer	354,000 km

Source: Schönbeck et al., 2003.

* Defra, 2002a.

9.2.3. General Description of the History of Water Laws

As stated in the introduction, this report concentrates on the general framework for water management in England and Wales. Accordingly, the legislation outlined in the following section applies to England and Wales and is not necessarily relevant to all parts of the UK.

In the following, the history of water law in England and Wales over the past 100 years will be described. The developments will be split into five phases based on changes in the underlying policy rationale for water management.

²¹⁹ 10% without wastewater treatment; 12% mechanical treatment, i.e. primary level; 52% biological treatment, i.e. secondary level; 20% advanced treatment, i.e. tertiary level (DEFRA, 2002a).

PHASE 1. UNTIL 1973: THE ROLE OF THE LOCAL AUTHORITIES AND STATUTORY WATER COMPANIES

Public water supply and sewerage treatment developed in England and Wales during the industrial revolution. The growing urban population was in some areas supplied with water by private companies (Statutory Water Companies - SWCs), which derived their powers directly from Parliament through local acts. The **Waterworks Clauses Acts** that were passed in **1847 and 1863** provided model powers for the SWCs. Many of the companies were taken over by local authorities, but later take-overs went the other way and a small number of SWCs secured a significant proportion of the market for drinking water supply in England and Wales. The **1848 Public Health Act** saw the start of the development of the sewerage system as method of foul waste disposal in England and Wales, and in **1876**, the **Rivers Pollution Prevention Act** made it an offence to pollute waters with solid matters or sewage.

The **Public Health Acts of 1875 and 1936** set out the basic code for domestic supply and sewerage disposal by local authorities (Rees and Zabel, 1998). This code was later revised by the Water Act 1945 (see below).

Prior to 1974, water supply and sewage collection, treatment and disposal were municipal responsibilities delivered through a large number of municipal and inter-municipal undertakings and a small number of private companies. A government survey in 1915 identified 2,160 water undertakings, including 786 local authorities. As both the scattered organisation and fragmented legislation was deemed inefficient, the **Water Act 1945** brought together previous water legislation and introduced a "*waterworks code*". It encouraged amalgamations of water companies and boards. By 1963, the numbers had been reduced to 100 water boards (each comprising two or more local authorities), 50 local authorities and 29 privately owned SWCs (Ofwat, 2002a)²²⁰.

In 1951, the powers of the boards were increased when they were given the role of consenting discharges, of which sewage effluents were the most important, under the **Rivers (Prevention of Pollution) Act 1951**, which applied to new discharges only, and the **1961 Act**, which

²²⁰ The number of sewerage undertakers, however, remained around 1,4000 until 1974 (Rees and Zabel, 1998).

brought existing discharges under the same control. A severe drought in 1959, combined with concern over spray irrigation, led to the passage of the **Water Resource Act in 1963**. The Act gave extra powers and responsibilities to the river boards, including powers to develop water resources to assist the water suppliers in their task (Rees and Zabel, 1998).

This phase was characterised by establishing a legal framework for water supply and sewage collection, treatment and disposal, including regulations on discharges into waters.

PHASE 2. 1973-1985: CENTRALISATION OF WATER SERVICES

A further centralisation of water services was initiated in 1973 through the **Water Act 1973**, which created ten *Regional Water Authorities* (RWAs) with boundaries based on river basins. The RWAs had responsibilities for water conservation; controlling pollution of inland and tidal waters; land drainage and flood control; fisheries; and supply of water and sewerage services (Zabel and Rees, 1998). The water authorities, like nationalised industries, were subject to government targets and financial control (Ofwat, 2002a).

This system was further reformed and centralised through the **Water Act 1983**, which removed residual municipal powers in favour of central government control. In order to compensate for the reduction in public involvement, *Consumer Consultative Committees* (CCC) were set up by the regional water authorities on an area-wide basis within their territories. The water authorities were responsible for all appointments to these committees (Ofwat, 2002a).

This phase was characterised by centralising the provision of water services and removing municipal power in favour of central government control.

PHASE 3. 1986-1989: THE PRIVATISATION PROCESS

In **1986**, a discussion paper on the possible privatisation of the water industry (**White Paper**) was published by the Department of the Environment (DoE). It proposed privatising the ten regional RWA's in their existing form. This included responsibility for providing water and



sewerage services and monitoring river water quality and the control of abstractions (Ofwat, 2002a)²²¹.

In response to the White Paper, many organisations expressed their concerns about privatising the regulatory aspects of the water authorities. In response, the DoE published a **Consultation Paper** in 1987 which proposed privatising the water and sewerage provision aspects of the boards and setting up the *National Rivers Authority* (NRA) to take responsibility for water quality in rivers, lakes and bathing waters (Ofwat, 2002a).

The current legal framework was laid out by the **1989 Water Act** (the 1989 Act), which provided for the privatisation of the RWAs by selling shares to the UK public²²². The newly floated companies became owners of the entire water and sanitation systems and property of the RWAs, and became statutorily responsible for water and sanitation services in their areas. About 25% of the population continued to be provided with water supply only by previously existing small private water supply companies. To meet European water quality and environmental standards, the Government wrote off £5 billion (€7.32 billion) of the industry's debts and gave them a £1.6 billion (€2.34 billion) cash injection, known as the "*green dowry*". All the companies are private entities which can be bought and sold like any other company, and most have become owned by larger groups. They have statutory duties to provide water and sewerage services in their areas, however, and are directly obliged to implement relevant EU legislation, as they have been ruled to be "*emanations of the state*" (Ofwat, 2002a). Under the 1989 Act, the Director General of Water Services has established ten Customer Service Committees (CSCs) to represent the interests of customers and potential customers of the appointed companies. The CSC areas correspond broadly to those of the former water authorities (c.f. section 9.2.4.6).

The **Water Supply (Water Quality) Regulations 1989** (the 1989 Regulations) incorporate all the standards set out in the 1980 EC Drinking Water Directive on the quality of water

²²¹ The paper stated "*Privatisation itself will encourage the water services plcs* (Annotation: public limited companies) *to compete effectively in fields where they can do so. Where this is not practical the Government's aim is to introduce a system of regulation which will stimulate a competitive approach. Profit is a more effective incentive than Government controls*" (Ofwat, 2002a).

²²² Shares in the holding companies of the ten water and sewerage companies were offered for sale in November 1989 at £1.00 on application with two further payments of 70p in July 1990 and July 1991. The offer was oversubscribed (Ofwat, 2002a).

intended for human consumption. They also include some specific national standards and set out requirements for monitoring drinking water quality, water treatment, and the provision of information. The 1989 Regulations also govern the use of water treatment chemicals and drinking water system construction products. In 1990, provisions for the control of pollution arising from certain industrial and other processes were introduced by the **Environmental Protection Act 1990**.

This phase was characterised by the privatisation of the provision of water and sewerage services.

PHASE 4. 1990-1999: CONSOLIDATION OF EXISTING LEGISLATION AND EXTENDING COMPETITION

A major consolidation of the different acts governing water management was carried out in 1991. The consolidation resulted in the introduction of four important acts for water management, namely the Water Industry Act 1991, the Water Resources Act 1991, the Statutory Water Companies Act 1991 and the Water Consolidation (Consequential Provisions) Act 1991.

The **Water Industry Act 1991** (WIA 1991) consolidated the 1989 Act and was introduced in preparation for the privatisation of the public water utility providers. The WIA 1991 is the primary legislation which provides the basis for additional and more detailed regulations establishing limit values and requirements (see below).

It determines the obligations and powers of the Water Companies and establishes the responsibility of the economic regulator, the Director General of Water Services, and his agency, the Office of Water Services (Ofwat, see section 9.2.4.4). Two years after the privatisation process had been launched, it had become apparent that an official regulator was needed to ensure that the customers' and society's (long-term) interests were respected.

The second major act passed in 1991 is the **Water Resource Act 1991** (WAR 1991). It defines the functions, duties and powers of the National Rivers Authority (NRA), which has since been converted into the Environment Agency (see Environment Act 1995). The duties of the Authority include issuing and controlling abstraction and effluent discharge licences.



The third important Act passed in 1991 is the **Statutory Water Companies Act 1991**, which aimed at consolidating prior enactment relating to the statutory water companies. The amendments, repeals and transitional arrangements arising from the consolidation of the water legislation in 1991 are defined by the **Water Consolidation (Consequential Provisions) Act 1991**, the fourth important piece of legislation passed in 1991.

In 1995, the **Environment Act** was introduced as an amendment to the WIA 1991²²³. This Act established the Environment Agency (EA) in England and Wales and combined the previously separate functions of the NRA. The new agency was now responsible for water resources management, of Her Majesty's Inspectorate of Pollution, controlling the main polluting processes, and of the Waste Disposal Authorities, dealing with the management of waste disposal services under the auspices of this new Agency. Analogously, the Scottish Environment Protection Agency (SEPA) was established in Scotland under the Environment Act 1995 (see section 9.2.4.2).

In 1992, the **Competition and Service (Utilities) Act** was passed, which covers all utilities (gas, water, electricity and telecommunication). With regard to water services, the Act amends and updates the WIA 1991 with respect to the standards of performance and service to customers. Part I of the Act defines the obligations and powers of Ofwat for measuring the performance of water services and for dealing with complaints and resolving disputes. Part II deals with competition and the provisions for replacing an appointed undertaker. The EC directive on public procurement, which governs procurement in the water and other utility industries, was implemented later by the **Utilities Contracts Regulations 1996** (the "Utilities Regulations"). On the basis of this regulation, Ofwat monitors companies' use of associates for subcontracting e.g. construction and maintenance work.

In order to further strengthen the overall framework for competition in the UK, a major piece of legislation was passed in 1998 which also affected the water sector: the **Competition Act 1998**²²⁴ outlaws any agreements that (may) have a damaging effect on competition. The Act prohibits agreements between businesses (including water companies) that actively or intend

²²³ This amendment is called "Section 101A of the Water Industry Act 1991."

²²⁴ The Director General of Fair Trading has the main responsibility for administering this Act. The regulators for each of the utilities share this responsibility for the sectors they regulate (Ofwat, 2002a).



to prevent, restrict or distort competition, and also forbids conduct that amounts to the abuse of a dominant position in a market that may affect competition in the UK.

After the election of a Labour government in 1997, changes were introduced in the **Water Industry Act 1999** (WIA 1999) which made Ofwat's first priority the interests of the consumer, removed companies' powers to disconnect customers for non-payment of charges and limited the circumstances in which companies can compulsorily meter customers. The WIA 1999 gives Ofwat the task of approving companies' charges schemes. It also allows the Secretary of State to issue regulations setting out requirements that should be included in companies' charging schemes.

This phase was characterised by the consolidation of the relevant legal framework, the establishment of EA and SEPA, regulations for increased competition, the focus on interests of the customers and the regulatory framework for approval of prices.

PHASE 5. AFTER 1999: INDEPENDENCE OF CONSUMER REPRESENTATIVES AND IMPLEMENTATION OF THE WATER FRAMEWORK DIRECTIVE

In 1998, the Government issued a **consultation paper** on utility regulation²²⁵, followed by a White Paper. This anticipated a number of legislative changes for each of the utilities. The proposed **Utilities Bill** applied to gas, electricity, water and telecommunications, but during the course of its passage through Parliament, the clauses relating to the water and telecom industries were dropped from the final Utilities Act 2000 due to insufficient parliamentary time (Ofwat, 2002a).

In November 2000, the Department of the Environment, Transport and the Regions (now Department for Environment, Food and Rural Affairs – DEFRA) published a **draft Water Bill** for public consultation²²⁶. This includes clauses dropped from the Utilities Bill (see above). The draft bill sets out to secure the independence of consumer representatives by setting up an independent Consumer Council for Water; make the protection of customers one of Ofwat's primary duties (cf. Section 9.2.4.4); give Ofwat a duty to promote, rather than

²²⁵ Cf. Ofwat, 1998.

²²⁶ Cf. Ofwat, 2000b.

facilitate, competition; and reform abstraction licensing and promote water conservation. The **Government's Response** to the consultation was published in **May 2002**²²⁷. The draft Water Bill was suspended by the **Water Bill** published on 20 February 2003. On 21 November 2003, the Water Act 2003 was granted Royal Assent.

Following a **consultation paper on competition in the water industry**²²⁸, the Government announced in March 2001 that it would boost the opportunities for competition in water services. Since then, the Government has been undertaking further work with Ofwat, the industry and other stakeholders, and announced in March 2002 that it proposes to extend competition for non-household customers that use large quantities of water.

In 2000, the **EC Drinking Water Directive**²²⁹ was transposed into UK law by the **Water Supply (Water Quality) Regulations 2000**, which differentiates between microbiological and chemical parameters. The Regulations apply to water companies whose area of supply is entirely or mainly in England. The National Assembly for Wales adopted similar new Regulations at the end of 2001, and these apply to water companies whose area of supply is entirely or mainly in Wales. The majority of the new Regulations will come into force at the end of December 2003.

In the UK, the co-ordination of the implementation of the **EC Water Framework Directive** (WFD)²³⁰ lies under the overall responsibility of Defra, with devolved implementation responsibility with SEPA (Scotland) and the Environment Heritage Service (Northern Ireland). While no specific national guidance document has been prepared, several documents that support the implementation of the WFD have been developed for the UK. The most important documents are the second and third consultation documents on the WFD **DATE**. They set out the next implementation steps for England and Wales until 2015 and identify the responsible bodies²³¹. The **third consultation paper** on the implementation of the WFD was published on 4 August 2003. The paper contains draft transposing regulations and

²²⁷ Cf. Ofwat, 2002b.

²²⁸ Cf. Ofwat, 2000a.

²²⁹ Council Directive 98/83/EC of 3 November 1998 on the quality of water intended for human consumption, OJ EC No. L 330, 5.12.98, p. 32.

²³⁰ Directive of the European Parliament and of the Council 2000/60/EC of 23 October 2000 establishing a framework for Community action in the field of water policy, OJ EC No. L 327, 22.12.2000, p. 1-73.

²³¹ Andrews, 2003.

commentary on these, a revised Regulatory Impact Assessment (RIA) and a summary of responses to the second consultation paper (of October 2002) with the Government's reply²³².

This phase was characterised by reform of abstraction licensing, procurement of water conservation, implementation of EU Directives and efforts to extend competition to large non-household customers.

9.2.4. Main Public and Private Actors Involved

9.2.4.1. UK Government and the Devolved Institutions

In England, the **Department for Environment, Food and Rural Affairs** (Defra²³³) is responsible for all aspects of water policy, including water supply and resources, and the regulatory systems for the water environment and the water industry. These include: drinking water quality; the quality of water in rivers, lakes and estuaries; coastal and marine waters; sewage treatment; and reservoir safety. The **Secretary of State** for Environment, Food & Rural Affairs deals with appeals against the Environment Agency's abstraction licensing decisions.

The **National Assembly for Wales** (NAW) was established under the Government of Wales Act 1998. The NAW has statutory and policy responsibility for matters related to the water industry in Wales, although there are special powers for the Secretary of State to intervene in matters concerning the cross-border rivers – the Severn, the Dee and the Wye.

One of the main responsibilities of the **Department for the Environment in Northern Ireland** (DOE) is to protect, conserve and enhance the aquatic environment for the benefit of present and future generations in Northern Ireland.

In Scotland, the **Scottish Executive** has overall responsibility for the regulatory framework for the water industry and is also responsible for ensuring compliance with the water authorities with specified drinking water quality standards.

²³² In Scotland, the Water Environment and Water Services (WEWS) Act 2003 transposes the WFD.

²³³ DEFRA is a merger of functions from the former Ministry of Agriculture, Fisheries and Food (MAFF), Department of the Environment, Transport and the Regions (DETR) and Home Office (the Government department responsible for internal affairs in England and Wales).

9.2.4.2. *Further Institutions for Water Management*

The **Environment Agency** (EA) was set up by the 1995 Environment Act (see section **Erreur ! Source du renvoi introuvable.**). As a non-departmental public body, the EA is sponsored largely by the Department for Environment, Food & Rural Affairs (DEFRA) and the National Assembly for Wales (NAW). The EA has the duty to conserve, augment, redistribute and secure the proper use of water resources in **England and Wales**. It is the central body with responsibility for long-term water resources planning in England and Wales. Other relevant responsibilities of the Agency include: abstraction licensing (for more details, see section 9.3.1.2), flood defence on main rivers, water quality, waste minimisation in certain regulated industries (including the minimisation of the waste of water), fisheries and navigation on some rivers.

In Scotland, the **Scottish Environment Protection Agency** (SEPA), also established by the Environment Act 1995 (see section 9.2.3), has the duty to control discharges into surface water, tidal water to a three-mile limit, and groundwater²³⁴. Furthermore, SEPA's functions include regulating the impact that Scottish Water (the public water service provider) has on the environment, principally by granting consent to discharges into the aquatic environment from Scottish Water's wastewater treatment works (Scottish Executive Environment Group, 2003).

The **Environment and Heritage Service** (EHS), which is the largest agency within the Department of the Environment in Northern Ireland (DOE, see above), takes the lead in advising on, and in implementing, the Government's environmental policy and strategy in Northern Ireland. The Water Management Unit (WMU) of EHS protects the aquatic environment through a variety of activities, including monitoring water quality; preparing water quality management plans; controlling effluent discharges; taking actions to combat or minimise the effects of pollution; and supporting environmental research. The **Northern Ireland Water Council** consists of fifteen people who have been appointed to the council for a three-year period up to March 2006. The Water Council's role is to advise the DOE on the promotion of the conservation of water resources in Northern Ireland, the supply and

²³⁴ Cf. Scottish Environment Protection Agency Website, [<http://www.sepa.org.uk/about/facts.htm>].

distribution of water, the provision and maintenance of sewers and on water management programmes²³⁵.

9.2.4.3. *Further Institution for Quality Control*

The **Drinking Water Inspectorate** (DWI) is responsible for assessing the quality of drinking water in **England and Wales** and taking enforcement action if standards are not being met and when water is unfit for human consumption. Its main job is to monitor that the water companies in England and Wales supply water that is safe to drink and meets the standards set in the Water Quality Regulations (see section 9.3.2). It also investigates complaints from consumers and incidents which affect or could affect drinking water quality. Its investigations of incidents can lead to prosecution of water companies.

In **Scotland**, the **Drinking Water Quality Regulator** (established by the Water Industry (Scotland) Act 2002) is responsible for assessing the quality of drinking water. The regulator's functions include ensuring that Scottish Water complies with drinking water quality duties (Scottish Executive Environment Group, 2003).

In **Northern Ireland**, the **Drinking Water Inspectorate (for Northern Ireland)** regulates and assesses drinking water quality.

9.2.4.4. *Responsibilities for Economic Regulation*

Economic regulation of the water companies of **England and Wales** is carried out by the Director General of Water Services (the Director) through his **Office of Water Services** (Ofwat). Ofwat is responsible for ensuring that the long term interests of the consumers are respected; that prices charged by the water companies are reasonable; and that the service-providing companies duly perform their duties. To this end, Ofwat steps in and compares the companies' performance against each other through a mechanism known as *yardstick competition*.

Ofwat's regulatory mechanism is by price-cap and is carried out every five years, taking account of general retail price inflation as well as performance standards, efficiency and

²³⁵ Cf. Environment and Heritage Service Website, [<http://www.ehsni.gov.uk/about/advisorycouncils.shtml>].



service levels. Box 9-2 gives a short overview of the overall framework for competition in the water sector in England and Wales, and Ofwat's role in it.

Box 9-2: Framework for Competition in England & Wales

The general framework for competition in the water sector in England and Wales is based on comparative competition, or **yardstick competition**: the economic regulator Ofwat evaluates the relative efficiency of each company in comparison to the most efficient company²³⁶ and determines on this basis the allowable price increase (price cap, see below, Box 9-7) for each regulated company. With the allowable price increase thus being fixed, each company has an incentive to further reduce its costs and to improve its efficiency beyond the one assumed when prices were set, in order to increase its profits. The resulting new efficient practices then serve as the basis for the next periodic review by Ofwat. While this method ideally leads to continuous improvements in service quality and (relative) reductions in costs, its efficiency in application to the water sector of England and Wales has often been questioned, as it lacks key features of market competition, most notably the threat of market entry and customer choice (Ofwat, 2002).

To enhance this basic framework for competition, the Utilities Act 1992 and the Competition Act 1998 paved the way for introducing supplementary methods. At present, Ofwat describes four main ways to achieve further competition, namely inset appointments, cross-border supplies, unregulated supplies and common carriage:

Inset Appointments:

This mechanism aims at increasing the incentives for supplying companies to introduce lower tariffs and better services for the larger

customers. A competitor who wishes to challenge a licensed supplier can apply at Ofwat for a so-called inset appointment, which allows him to replace the licensed supplier for a specific geographic area within his monopoly supply area. Inset appointments are limited to large users of more than 100 megalitres of water per year²³⁷, or to sites which are not already served by a licensed supplier (greenfield).

So far, no extensive use has been made of this mechanism, as the application process is very detailed and has been criticised as being too slow and cumbersome.

Cross-border supplies or out-of-area supplies

Customers are entitled to receive water for domestic purposes from any licensed supplier, irrespective of where they live (Ofwat, 2002). Accordingly, customers can get connections from another company within a monopoly supply area licensed to one supplier, but must finance the cost of that connection themselves.

Unregulated supplies

Most people in England and Wales receive their water and sewerage services from licensed companies which are regulated by Ofwat. However, a few unregulated companies still exist, and consumers are also free to buy supplies from them. While customers of unregulated supplies are not represented by the standard customer representation organs, customer complaints can be considered by Ofwat under the premises of the Competition Act 1998.

Common carriage

The concept of common carriage applies if one service provider shares the use of another's assets, such as its pipes or treatment works. In order to avoid infringements on the Competition Act 1998, all companies had to publish so-called access codes, which set out the terms under which they grant access to their facilities. Common carriage still does not occur in practice, and therefore has been dismissed by many as an ineffective tool for enhancing industry-wide competition and facilitating the entry of new entrants. Furthermore, the mechanism has

²³⁶ In this assessment, not only final costs play a role, but also the quality of the service provided (e.g. the security of supply, the water quality, etc.).

²³⁷ On 20 July 2000, the threshold for inset-appointments was lowered from the previous limit of not less than 250 megalitres per year to 100 megalitres per year (for England) due to low take-up rates.



by many been criticised as an inapt mechanism for water service provision based on severe quality and hygienic concerns linked to the sharing of facilities.

Competition on the “supply market” to the water industry

In the UK, the Utilities Contracts Regulations 1996 (the “Utilities Regulations”), which implement EC directives on public procurement, govern procurement in the water and other utility industries. Ofwat monitors companies’ use of associates for subcontracting e.g. construction and maintenance work. A significant portion of the industry’s operational and investment activities are already contracted out, including meter reading, pipe laying and the operation of treatment works (Hall, 2002). It has been claimed by the companies that substantial efficiency gains could already be reached on the basis of contracting out. Nevertheless, due to the high degree of vertical integration in the water sector in England and Wales, it has often been claimed that competition on the supply market is far less pronounced than in other European water sectors (cf. UBA, 2001).

The **Water Industry Commissioner for Scotland** (WIC) is the economic and customer services regulator of Scottish Water and has the function of promoting the interests of Scottish Water's customers. The Commissioner's particular functions are to investigate and report on customer complaints, advise ministers on the level of income needed by Scottish Water to perform its functions and, in light of the ministers' decisions on that point, to approve annual water charges schemes proposed by Scottish Water (Scottish Executive Environment Group, 2003).

9.2.4.5. Regional Services by Private Companies

The ten independent **Water and Sewerage Companies** (WaSCs) created in 1989 (for details about the privatisation process, cf. section 9.2.3) are key to the structure of the water industry in **England and Wales** and provide the licensed sewerage service for all of England and Wales on a regional monopoly basis. They also provide the licensed water service for much of England and Wales, with the remainder being provided by thirteen licensed **Water supply ‘only’ Companies** (WoCs). Together, these twenty-three companies provide the regulated water and sewerage services for England and Wales.

Water and sewerage companies have the statutory duty to develop and maintain an efficient and economical system for water supply and sanitation in their area. Water companies are responsible for providing a clean and reliable supply of water; publishing annually reviewed water resources plans, submitted to the Environment Agency, setting out each company’s view of how it will manage water resources over the next 25 years; creating drought plans setting out responses to different types of drought; proposing and justifying water resources schemes for incorporation into Ofwat’s periodic reviews of water charges; promoting the



efficient use of water on behalf of customers; and maintaining an economical and efficient supply system.

The overall structure described above has remained in place to the present day. There have been a number of mergers, but only involving smaller companies, as the ten large companies are still separately owned (although not necessarily by the same owners as in 1989). This has in part been the result of the government's restrictive merger policy (cf. section **Erreur ! Source du renvoi introuvable.**). The main change, which continues to impact the industry, is change of ownership. Companies change owners relatively frequently and some are no longer listed on the London Stock Exchange, as they have been bought by companies based outside the United Kingdom. Box 9-3 presents the framework for contracts for water supply and sewerage companies in England and Wales.

Box 9-3: Framework for Contracts in England & Wales

Under the Water Act 1989 (see section 9.2.3), the newly floated companies were appointed as statutory undertakers by the Secretary of State for the provision of sanitation and water supply services²³⁸. These concessions will last at least until 2014, although they may be terminated by the government with ten years notice. Ofwat can seek court orders to insist on the performance of a duty. If the company does not comply, Ofwat can ask the court to appoint a special administrator.

While EU procurement directives do not currently require competitive tendering procedures for concessions, there was a recent court ruling that prevented the transfer of an operating concession without allowing competing bids, when Welsh water was restructured.

In case of transfer of ownership, the Water Industry Act 1991 (see section 9.2.3) requires the Secretary of State to refer a merger to the Competition Commission (CC) if the gross assets of each of the water enterprises to be merged exceed £30 million (about €44 million). EC Mergers Regulations²³⁹ apply if the combined aggregate turnover of all the undertakings concerned is more than €5,000 million. Proposals for transfer of ownership and changes in structure other than through mergers and acquisitions have to be referred to Ofwat, which then has to take account in its decision making process of consumer benefits, efficiency aspects and environmental duties.

Source: Schönböck et al., 2003.

The situation in **Scotland** is different, with one public sector company (**Scottish Water**) that replaced East of Scotland Water, North of Scotland Water and West of Scotland Water in 2002, which now provides water and sewerage services. Scottish Water was established as a public corporation by the Water Industry (Scotland) Act 2002. Accountable to the Scottish

²³⁸ With the exception of the 25% of the market covered by the existing small private companies.

²³⁹ "Council Regulation (EEC) No 4064/89 of 21 December 1989 on the control of concentrations between undertakings," OJ EC L 395, 30.12.1989, p 1-12.

Ministers, and through them to the Scottish Parliament, it is structured and managed like a private company²⁴⁰. The Programme of a Better Scotland, published in May 2003, confirmed the ministers' commitment to keeping Scottish Water in the public sector (Scottish Executive Environment Group, 2003).

In **Northern Ireland**, the provision of water services remains part of a governmental department.

9.2.4.6. Representing Water Customers

Ten regional Ofwat **Customer Service Committees** (CSC) were established under Section 28 of the Water Industry Act 1991 and set up by the Director General of Water Services (see section 9.2.3). The ten committee chairmen form the Ofwat **National Customer Council** (ONCC). In April 2002, **WaterVoice** was introduced as the official name of the Ofwat National Customer Council and the Ofwat Customer Service Committees. WaterVoice provides an independent voice for all customers of the water and sewerage companies in England and Wales. Since then, the Customer Service Committees have been called **WaterVoice Committees**, and the Ofwat National Customer Council **WaterVoice Council** (WaterVoice, 2002).

The WaterVoice Committees operate throughout nine regions in England and one in Wales²⁴¹. They promote customers' interests in respect to price, service and value for money, and also investigate complaints from customers about their water companies. The WaterVoice Council and its sub-groups are made up of WaterVoice Committee chairmen and members and deal with issues at the national and European levels (WaterVoice, 2002).

The Government made the provision in the draft Water Bill (since 21 November 2003 Water Act 2003, see section 9.2.3) to replace the existing committees with an independent **Consumer Council for Water** (see Box 9-4) supported by new regional committees

²⁴⁰ Ministers appoint the chairman and non-executive members of the Scottish water board and approve the appointment of its executive members (Scottish Executive Environment Group, 2003).

²⁴¹ Each committee meets in public at least four times a year (WaterVoice, 2002).



(WaterVoice, 2003). In October 2003, the Government stated that the new Consumer Council for Water will not be set up and made operational before April 2005²⁴².

Box 9-4: The Consumer Council for Water

One of the new structural elements introduced through the Water Act 2003 is the provision to establish an independent *Consumer Council for Water*. The main functions of the council, as set out in clauses 31-35 of the Act, can broadly be summarised as:

- To keep itself informed of consumer matters and the views of consumers throughout England and Wales;
- To make proposals, provide advice and information and represent the views of consumers to public authorities, companies holding an appointment as a water or sewerage undertaker and anyone else whose activities may affect the interests of consumers;
- To seek to resolve specific complaints from consumers;
- To provide consumers with information and advice; and
- To publish information and advice in the consumers' interest.

Furthermore, the clauses give the Council the power to carry out investigations and set out arrangements for the exchange of information from the Director and companies holding an appointment as a water or sewerage undertaker.

Source: Defra Homepage, 2003.

In **Scotland**, the views and interests of Scottish Water's customers in their respective areas are represented by the **Water Customer Consultation Panels** (established by the Water Industry (Scotland) Act 2002) (Scottish Executive Environment Group, 2003).

9.2.4.7. Local Authorities

Strategic planning authorities and local authorities are responsible for the land use planning framework and planning decisions. Local authorities also regulate the quality of private drinking water supplies through their environmental health duties.

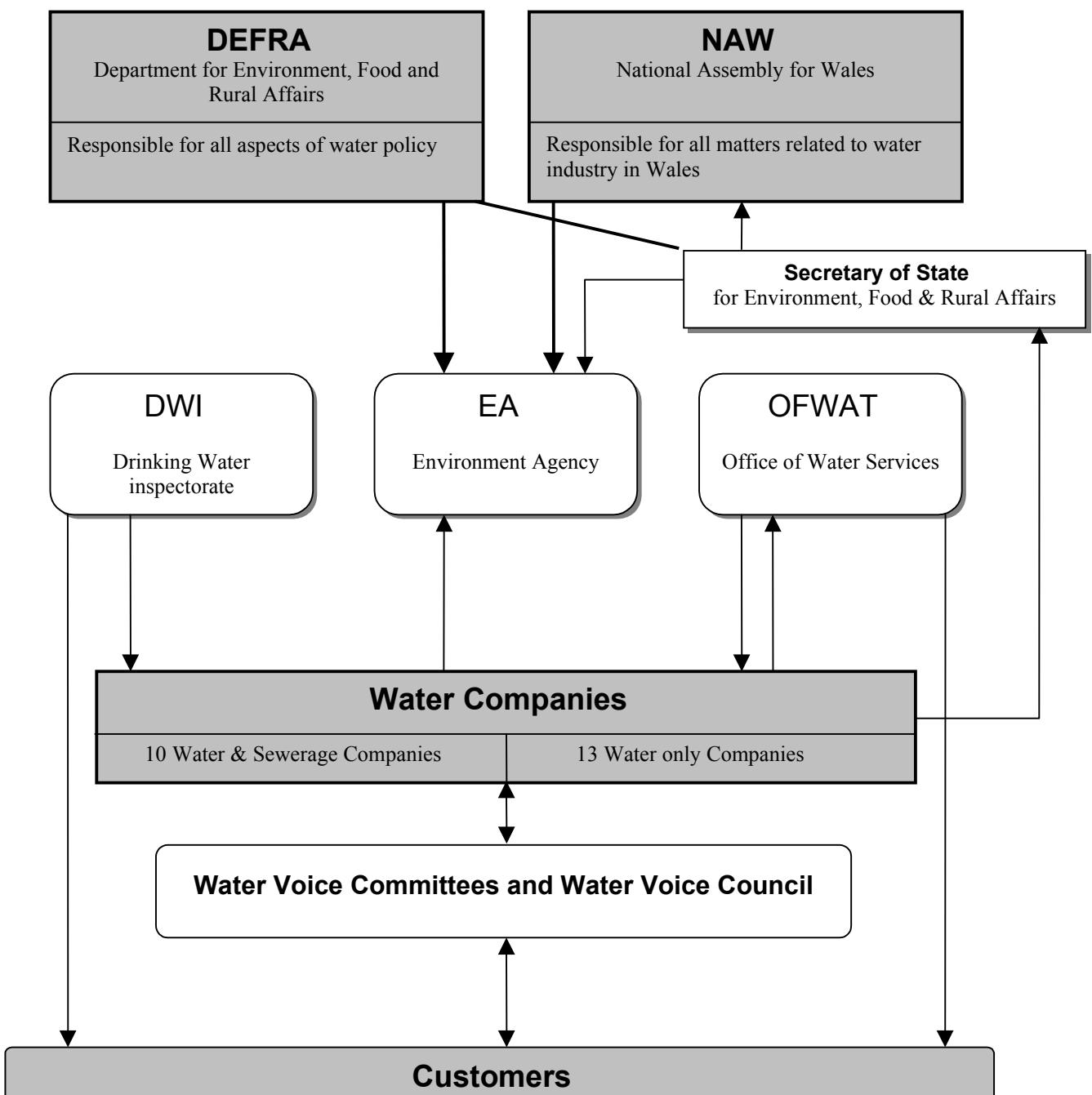
Figure 9-2 gives a summary of the principal institutional relationship for water management in England and Wales²⁴³.

²⁴² See news release of DEFRA, [<http://www.defra.gov.uk/news/2003/031017a.htm>].

²⁴³ Annex 1 provides an analogous figure for Scotland.



Figure 9-2: Actors in Water Management in England and Wales



9.2.5. Summary table

The following Table 9-1 summarises the information provided in this chapter: It gives an overview of the historical phases by outlining the main legislative changes along with their underlying policy rationale.



Table 9-1: Summary of the History of Water Law in the UK

Phase	Legislation	Content of the Legislation	Policy Rationale
Phase I: Until 1973: The Role of the Local Authorities and Statutory Water Companies	1847 and 1863: Waterworks Clauses Acts 1848: Public Health Act 1876: Rivers Pollution Prevention Act 1875 and 1936: Public Health Act 1945: Water Act 1951 and 1961: Rivers (Prevention of Pollution) Act 1963: Water Resource Act	<i>Waterworks Clauses Acts</i> : provided model powers for the SWCs <i>Public Health Act</i> : start of the development of the sewerage system as method of foul waste disposal <i>Rivers Pollution Prevention Act</i> : made it an offence to pollute waters with solid matters or sewage <i>Public Health Act</i> : set out the basic code for domestic supply and sewerage disposal by Local Authorities <i>Water Act (1945)</i> : brought together previous water legislation and introduced a "waterworks code"; encouraged amalgamations of water companies and boards <i>Rivers (Prevention of Pollution) Act</i> : 1951 Act increased the powers of the Boards: they were given the role of consenting discharges; applied to new discharges only; 1961 Act, brought existing discharges under the same control. <i>Water Resource Act (1963)</i> : gave extra powers and responsibilities to the River Boards including powers to develop water resources to assist the water suppliers in their task	<i>This phase was characterised by establishing a legal framework for water supply and sewage collection, treatment and disposal including regulations on discharges in waters</i>
Phase II: 1973-1984: Origins of the Regional Water Authorities	1973: Water Act 1983: Water Act	<i>Water Act 1973</i> : Created ten Regional Water Authorities with boundaries based on river basins; <i>Water Act 1983</i> : removed residual municipal powers in favour of central government control;	<i>This phase was characterised by centralising the water services and removing municipal power in favour of central government control</i>
Phase III: 1985-1989: The Privatisation Process	1989: Water Act 1989: Water Supply (Water Quality) Regulations	<i>Water Act (1989)</i> : provided for the privatisation of the RWAs, by sale of shares to the UK public <i>Water Supply (Water Quality) Regulations (1989)</i> : implemented the 1980 EC Drinking Water Directive; include some specific national standards and set out requirements for monitoring drinking water quality, water treatment, and the provision of information; govern the use of water treatment chemicals and drinking water system construction products	<i>This phase was characterised by the privatisation of the provision of water and sewerage services</i>
Phase IV: 1990-1999: Consolidation of Existing Legislation and Extending Competition	1990: Environmental Protection Act 1991: Water Industry Act 1991: Water Resource Act 1991: Statutory Water Companies Act 1991: Water Consolidation	<i>Environmental Protection Act (1990)</i> : introduced provisions for the control of pollution arising from certain industrial and other processes <i>Water Industry Act (1991)</i> : determines the obligations and powers of the Water Companies and the responsibility of the economic regulator (Ofwat); the primary legislation which enables Regulations setting limiting values and requirements <i>Water Resource Act (1991)</i> : defines the functions, duties and powers of the National Rivers Authority (nowadays the Environment Agency), including the responsibilities for	<i>This phase was characterised by the consolidation of the relevant legal framework, the establishment of EA and SEPA, the regulation to increased competition, the focus on interests of customers and the regulatory</i>



	(Consequential Provisions) Act 1995: Environment Act 1992: Competition and Service (Utilities) Act 1996: Utilities Contracts Regulations 1998: Competition Act 1999: Water Industry Act	issuing and controlling abstraction and effluent discharge licences <i>Statutory Water Companies Act (1991)</i> : consolidates enactment relating to statutory water companies; Water Consolidation (Consequential Provisions) Act (1991): deals with repeals and transitional arrangements arising from the consolidation of the water legislation in 1991 <i>Environment Act (1995)</i> : introduced as an amendment to the WIA 1991; established the Environment Agency (EA) in England and Wales and the Scottish Environment Protection Agency in Scotland; <i>Competition and Service (Utilities) Act (1992)</i> : amends and updates the WIA 1991 with respect to the standards of performance and service to customers; defines the obligations and powers of Ofwat with regard to measuring the performance of water services and for dealing with complaints and resolving disputes <i>Utilities Contracts Regulations (1996)</i> : implemented the EC Directive on Public Procurement: Ofwat monitors companies' use of associates for subcontracting e.g. construction and maintenance work <i>Competition Act (1998)</i> : outlaws any agreements that have a damaging effect on competition Water Industry Act (1999): made Ofwat's first priority the interests of the consumer, removed companies' powers to disconnect customers for non-payment of charges and limited the circumstances in which companies can compulsorily meter customers; gives the Director (Ofwat) the task of approving companies' charges schemes	<i>framework for approval of prices</i>
Phase V: After 1999: Independence of Consumer Representatives and Implementation of the Water Framework Directive	2000: Water Supply (Water Quality) Regulations 2003: Water Act 2003: 3 rd consultation paper on the European WFD	<i>Water Supply (Water Quality) Regulations (2000)</i> : implements the EC Drinking Water Directive 98/83/EC; differentiates between microbiological and chemical parameters; Regulations apply to water companies whose area of supply is entirely or mainly in England; <i>Water Act (2003)</i> : sets up an independent Consumer Council for Water; modifies abstraction licensing system; <i>3rd consultation paper on the European WFD</i> : contains proposed draft transposing regulations, a revised Regulatory Impact Assessment (RIA) and a summary of responses to the second consultation paper	<i>This phase was characterised by reform of abstraction licensing, procurement of water conservation, implementation of EU directives (Drinking Water and WFD) and extension of competition to large non-household customers</i>

9.3. ANALYSIS OF THE LEGISLATIVE DEVELOPMENT

In the following analysis, the water sector is divided into three parts: resource access, water production & distribution, and sewerage collection & treatment. In each part, legislation in force, objectives, instruments, target groups and actors of implementation are briefly introduced. Furthermore, the policy rationale and effects (outputs and outcomes) of the different parts are identified.

Prior to the following analysis, it should be noted that the water and sewerage industry in England and Wales currently consists of 23 companies created through the privatisation of the Regional Water Authorities (Water Act 1973, see section 9.2.3, phase 3 above), of which ten provide both water and sewerage services, while thirteen are Water only Companies (WoCs)²⁴⁴. Each company operates within a particular geographic region. The 23 companies are statutory undertakers, with duties and rights set out in primary legislation. They are vertically integrated and are responsible for all functions in the water supply chain, from resource development to the local distribution of water services, and from collection to treatment and discharge for sewerage services.

In general, customers buy water from their regional water company and cannot choose their supplier. However, as already outlined in Box 9-2, there are a few exceptions to this, particularly for industrial customers or those who are supplied from a private water source. The Competition Act 1998 has provided opportunities for new entrants to enter the market, and water companies have drawn up access codes describing the terms on which they will provide competitors with access to their pipes and facilities (*common carriage*).

²⁴⁴ Water only Companies supply drinking water to certain areas within the regions covered by the major Water and Sewerage Companies but are not involved in wastewater collection, treatment and disposal. As far as drinking water supply is concerned, the duties of water only and water and sewerage companies are the same.



9.3.1. Resource Access

Box 9-5: Legislation in Force on Resource Access

The Water Act 2003

The Water Resources Act 1963/ 1991

Natural Heritage (Scotland) Act 1991

9.3.1.1. Property Rights over Water Resources

The UK has a long-standing tradition of thinking of water as a “*shared resource*”, with even the state seen more as managing rather than owning UK waters (Zabel and Rees, 1998). According to this understanding, land ownership does not include the right to use ground water resources, except for those uses that are exempt from licensing procedures (e.g. abstractions of small amounts of water for domestic and agricultural uses are permitted on the basis of land ownership alone (see below, section 3.1.2)). The owners of land along a river bank (riparian owners) have rights up to the mid point of the channel, which include mooring, recreation and angling; but discharging wastes to the river or modifying its flow is generally prohibited without the consent of the Environment Agency (Zabel and Rees, 1998). Similar rights accrue to owners of land in which natural or artificial lakes are situated.

In general, it is an offence (according to the Water Resources Act 1991) to cause or knowingly permit the entrance into rivers, lakes, groundwater, coastal waters or relevant territorial waters, either directly or indirectly (i.e. via a drain or sewer), of polluting material, solid waste, effluents or any matter likely to hinder the water’s flow, unless the discharge was permitted by the Environment Agency (see section 9.3.3)²⁴⁵.

Reservoirs which are used for e.g. compensating flows to a river may be owned by the Environment Agency²⁴⁶.

²⁴⁵ The principal exceptions are small ponds and reservoirs which do not supply water to other watercourses - although public water supply reservoirs are included

²⁴⁶ <http://www.environment-agency.gov.uk>.

9.3.1.2. Public Policies on the Resource

Policy objectives:

The objective of public policies on water resources is to prevent over-abstraction and to improve control over the environmental effects of water abstractions; to ensure a fair and efficient allocation of water between competing local demands; and to contribute to maintaining and enhancing the quality of water dependent environments.

Instruments:

The following instruments have been made operational in order to achieve the objective stated above:

Abstraction Licences

Prior to the new Water Act 2003, the Water Resources Act 1991 formed the basis for abstraction licences. According to the new Water Act 2003, Article 1.1 (1), there will be *three general types of abstraction* licences, which are all time limited:

A licence can be issued for abstracting water from one source of supply:

- (a) over a period of twenty-eight days or more for any purpose (a "full" licence)²⁴⁷;
- (b) over a period of twenty-eight days or more for the purpose of transferring water to another source of supply without intervening use (a "transfer" licence);
- (c) over a period of less than twenty-eight days (a "temporary" licence).

There exist a number of exceptions to the general requirement for obtaining a licence for water abstraction, namely related to domestic and agriculture abstractions of 20 cubic metres or less per day from surface water or from groundwater; one-off abstractions up to 20 cubic metres; land drainage²⁴⁸; abstraction to test for the presence, quantity or quality of water; and

²⁴⁷ All abstractions granted in accordance with legislation prior to the Water Act 2003 have been of this type (full licence).

²⁴⁸ According to the Water Act 2003, the definition of land drainage does not include warping and irrigation (while former legislation only required a licence for spray irrigation).

fire fighting. Furthermore, dewatering mines, quarries or engineering excavations is in case of emergencies liberated from the general licence requirement. Generally, abstraction licences are granted based on the demonstrated right of access of the applicant for at least one year to the land where the abstraction will take place. Licence applications then need to be *brought to the attention* of those likely to be affected by them. In case a licensed abstraction causes damage or loss to anyone, the person has the right to seek *financial compensation* from the abstractor.

The Environment Agency charges abstraction licence holders in order to fund costs incurred in ensuring that water resources are managed effectively. Charges consist of an application fee as well as an annual fee which is based on volume abstracted and is linked to local water resources.

Water protection zones

With a view to preventing or controlling the entry of any polluting matter into controlled waters, areas can be designated as water protection zones, with activities in such zones being subject to specific restrictions (Water Resources Act 1991). Through the Environmentally Sensitive Areas Scheme, programmes are operated that aim to encourage good farming practices within these areas.

Sites of Special Scientific Interest

Seventy-seven rivers in England and Wales are classified as Sites of Special Scientific Interest, which represents the UK's top conservation status.

Planning instruments

A number of planning instruments (e.g. Regional Development Plans) have been made operational at different levels (e.g. Environment Agency and its regional offices).

Regulation related to pesticides, fertiliser use and manure spreading

Specific regulations apply to manure spreading fertiliser use and pesticides. For pesticides, a strict approval process and Codes of Practices on their use have to be followed. A voluntary

package of measures to reduce the environmental damage caused by pesticide use was implemented by the industry and other stakeholders (as of April 2001).

Target groups of the different instruments:

- Abstraction regulation is targeted at any abstractor that does not qualify for one of the exceptions outlined above in the description of the instrument.
- Within water protection areas, owners and authorised users of land may be obliged to tolerate certain measures (including measures related to the monitoring of water and soil).

Actors of Implementation:

- In England and Wales, the **Environment Agency** (EA) licences all abstractions²⁴⁹.
- The power to designate water protection zones belongs to the **Secretary of State** (DEFRA).
- The EA developed a long term strategy for water resources that looks 25 years ahead and considers the needs of both the environment and society. Regional offices of the EA develop regional plans for water resource management.

Rationale (overall approach):

If we prevent over-abstraction and improve control over the environmental effects of water abstraction, we can ensure an efficient allocation of water and enhance our water environment.

Policy Outcomes:

Over abstraction of water represents serious environmental problems for sensitive rivers in England and Wales. As Table 9-2 indicates, abstractions have remained relatively stable over the last years, both in total magnitude and in relative terms. In 2001-02, 43.880 abstraction licences were in force and 958 new licences were issued.

²⁴⁹ See Environment Agency Website, [<http://www.environment-agency.gov.uk/subjects/waterquality/>].



Table 9-2: Abstraction from freshwater in England and Wales

Public water supply		Industry	Fish farming, cress and ponds	Electricity supply industry	Other
1999	16,3	4,9	4,9	12,9	1,1
2000	17,0	4,4	4,7	16,9	1,1
2001	16,2	3,6	4,7	18,1	0,6

Units: thousand megalitres per day

Source: Environment Agency, Abstraction from freshwater in England and Wales, 1971 – 2001.

The designation of protection zones (e.g. designation of nitrate vulnerable zones²⁵⁰ and nitrate sensitive areas, and identification of sensitive areas) has increased considerably in recent years in an attempt to better preserve vulnerable areas and to comply with EU regulations (e.g. the EU Nitrates Directive).

Despite this trend, only an estimated 80% of the length of England and Wales' 77 "Sights of Specific Scientific Interest" (SSSI) rivers are considered to be in a 'good' or 'very good' chemical condition. Many of the rivers classified as SSSI have been affected by diffuse pollution. High phosphate levels were found in 54% of the rivers in England and Wales, and excessive nitrate concentrations were found in 29%²⁵¹.

²⁵⁰ It is being aimed at increasing the percentage of land area of England designated as "Nitrate Vulnerable Zone" from currently 8% of land to 47% of the land area.

²⁵¹ Environment Agency, www.environment-agency.gov.uk (2003).

9.3.2. Water Production and Distribution

Box 9-6: Legislation in Force on Water Production and Distribution

Water Industry Act 1991
 Water Industry Act 1999
 Water Supply (Water Quality) Regulations 1989
 Water Supply (Water Quality) Regulations 2000
 Private Water Supplies Regulations 1991

Policy objectives:

The objective is to ensure the efficient provision of good quality drinking water and compliance with national and EU regulations at affordable prices for consumers through quality standards and controls, economic regulation (charges), monitoring and transparent public information policies.

Instruments:

The following instruments have been put in place in order to achieve these objectives in the area of water production and distribution:

Water price

In England and Wales, only one in five households has a metered water supply that allows for bills to reflect the amount of water used²⁵². As charges based on actual use are not feasible without metering, most water in England and Wales remains charged as a rate on an old property tax base (rateable value – RV)²⁵³. The unmeasured bill usually comprises a fixed charge which includes the customer-related costs of supply (for example, billing) and an RV-related charge. As unmeasured charges have been criticised because water consumption does

²⁵² Per company, the proportion of domestic customers metered varies considerably and ranges from 3.3% (Portsmouth Water) to 53.7% (Tendring Hundred Water) (Ofwat, 2002d).

²⁵³ The Water Industry Act 1991 allowed companies to use RVs as a basis for charging until 31 March 2000. However, the Industry Act 1999 removed this deadline and gave companies the right to continue to use RVs for unmeasured charging purposes.

not necessarily increase with an increase in RV²⁵⁴, some companies have included an additional amount in the fixed charges, which reduces the range in the level of customers' bills between higher and lower RV properties (referred to as the RV modifier)²⁵⁵. As of 1 April 2000, all household customers are entitled to have a meter installed free of charge and the number of households with a meter has increased since then.

Quality standards

Water companies have a duty under the Water Industry Act 1991 to supply water that is wholesome at the time of supply, i.e. when water passes from the water company's pipe into the consumer's pipe. "Wholesomeness" is defined by reference to standards and other requirements set out in the Water Supply (Water Quality) Regulations 1989 (the 1989 Regulations, see section 9.2.3) and the Water Supply (Water Quality) Regulations 2000 (see also section 9.2.3). Water companies are required to submit to the Authorities programmes of work designed to secure compliance with the new and the revised standards.

Monitoring:

Water companies are themselves responsible for ensuring the quality of their supplies through adequate monitoring. This 'self-monitoring' role is, however, subject to supervision by local authorities and the Drinking Water Inspectorate, which conducts continuous technical audits to ensure that water companies are meeting all their regulatory obligations²⁵⁶.

Public information policy:

Water companies are obliged to publish the results of their monitoring activities and make all results of regulatory sampling available to the general public via their public record. Information must be provided to the interested public free of charge. Furthermore, water companies have to produce an annual report on drinking water quality for the local authorities in their supply area.

²⁵⁴ The more important criticism related to unmeasured charges concerns, however, the fact that this charging system does not offer incentives for more efficient resource use (incentive pricing).

²⁵⁵ Cf. Ofwat, 2002c.

²⁵⁶ Reports of these audits, where relevant, are available on the web site at: www.dwi.gov.uk.

Sanctions

Section 70 of the Water Industry Act 1991 makes it a criminal offence for a water company to supply water that is unsuited for human consumption. Section 18 of the Act requires the Authorities to take enforcement action for any breach of:

- wholesomeness standards,
- monitoring and treatment, and/or
- records and information requirements

of the Regulations. However, enforcement action is not taken if the breach is: deemed to be trivial; unlikely to recur; the water company has taken immediate remedial action to prevent a recurrence; or the water company has submitted a legally-binding programme of work to achieve compliance within an acceptable time scale.

Target groups of the different instruments:

- All consumers are charged by the water supply companies. No levy/tax is imposed by municipalities with respect to water.
- Water supply companies are the target group at which quality standards, monitoring, information requirements and sanctions are aimed.

Actors of Implementation:

- The **Secretary of State for Environment, Food and Rural Affairs** and the **National Assembly for Wales** are responsible under the Water Industry Act 1991 for regulating the quality of public drinking water supplies. These Authorities have appointed technical assessors, in the form of the **Drinking Water Inspectorate**²⁵⁷, to act on their behalf. They

²⁵⁷ In England and Wales, the Drinking Water Inspectorate audits water companies to check whether they comply with the regulatory requirements. In Scotland, the Drinking Water Quality Regulator is responsible for assessing the quality of drinking water. In Northern Ireland, the Drinking Water Inspectorate (for Northern Ireland) regulates and assesses drinking water quality (see section 9.2.4.3).

have also delegated specific powers to the **Chief Inspector** to enforce water quality standards and initiate prosecutions.

- **Ofwat** regulates water (and sewerage) charges by setting a limit on the average increase in charges that a company can impose in any year. Box 9-7 provides more details on Ofwat's role in regulating charges.
- Disputes between Ofwat and the companies it regulates are mediated by the **Monopolies and Mergers Commission**, or at the highest level by the Minister of Commerce in his role as the head of the Board of Trade (Wrc, 1997).

Box 9-7: Ofwat's role in regulating water and sewerage charges

Ofwat regulates water and sewerage charges by setting a limit (also known as the *K factor*) on the average increase in charges that a company can impose in any year, for the 23 water (and sewerage) companies in England and Wales. K is the amount by which a company can increase (or must decrease) its average charge above (or below) inflation each year to finance its services and meet its legal obligations. When inflation is included, this is commonly referred to as the "price cap". K is applied to the basket of regulated charges - the tariff basket. This covers both measured and unmeasured water and sewerage services as well as trade effluent charges. Within the price limit, companies can increase or decrease average charges for individual basket items by different amounts. A company can, for example, increase charges for unmeasured sewerage services by a greater percentage than charges for measured sewerage services. A company has the option of increasing its overall average charge by less (or decrease them by more) than its K. If the company decides not to take the full available increase for any particular year, it can carry forward this unused K to future years.

For 2000-05, a single K factor for water and sewerage companies has been set by Ofwat, rather than separate water and sewerage service K factors.

Source: Ofwat, 1999.

Rationale (overall approach):

If we set the right economic regulations and ensure compliance with drinking water quality standards through adequate monitoring and enforcement, we can ensure an efficient provision of good quality drinking water.

Policy Outcomes:

Around 99% of the population of the England and Wales is currently connected to the supply network (Eurostat, 2002). As Ofwat reports in its tariff and charges report 2002, the charges set by the water companies for the provision of their services broadly correspond to the costs of providing these services, for metered and non-metered customers alike (Ofwat, 2002).

With regard to drinking water standards, 99.8% of sample tests in England and Wales in 2002 complied with the relevant standards²⁵⁸. The former comparably high rates of distribution cuts, for which the system had been criticised in the past on the quality side of service provision, could according to Ofwat be further reduced over the year 2002.

It is worth noticing that the distribution system in England and Wales is characterised by a high leakage rate (with an average rate of 22% in 2002). In order to foster reductions in leakage rates, Ofwat set the medium term objective in 1997 of achieving a so-called Economic Level of Leakage (ELL) by 2002-2003²⁵⁹, “which is the point at which the cost of reducing leakage is the same as the value of water saved” (Defra, 2003). While this target led to reductions in leakage rates, this approach has often been questioned at the international level for not taken sufficiently account of the value of the water resource itself and the benefit of preserving it.

9.3.3. Sewerage Collection and Treatment

Box 9-8: Legislation in Force on Sewerage Collection and Treatment

The Water Industry Act 1991
The Water Resources Act 1991
The Water Consolidation (Consequential Provisions) Act 1991
The Environment Act 1995
The Trade Effluents (Prescribed Processes and Substances) Regulations 1989
The Trade Effluents (Prescribed Processes and Substances) (Amendment) Regulations 1990
The Trade Effluents (Prescribed Processes and Substances) Regulations 1992

Policy objectives:

The objective can be summarised as ensuring the provision of sewerage collection and treatment through adequate control and monitoring devices financed through (financial) cost covering charges.

²⁵⁸ Fo more detailed results, see DWI at <http://www.dwi.gov.uk/pubs/annrep02/mainindex.htm>.

²⁵⁹ Ofwat, 2003.

Instruments:

The following instruments have been put into practice in order to achieve the objectives outlined above:

Sewerage charge

Sewerage charges are mostly derived on the basis of standardised property values used for taxation purposes (rateable values – RV). The remaining population pays volume-based sewerage charges (cf. Section on water tariffs above). Overall, Ofwat demands that charges should broadly relate to the costs of providing the service, for metered and non-metered customers alike. The individual water companies are, however, relatively free in setting tariffs and can charge different regions or classes of customers differently as long as they do not discriminate.

Discharge Consent:

All discharges to controlled waters require the granting of a discharge consent²⁶⁰. There are two main types of discharge consents, namely *numeric* and *descriptive consents*. Discharges which have the greatest potential to affect the quality of the receiving water have numeric concentration limits attached to their consents. These limits may apply to an individual substance or groups of substances. In the case of small discharges with a low potential of harming the aquatic environment, descriptive consents are applied which typically define the nature of the effluent treatment plant to be used and require that the plant be correctly operated and adequately maintained. Through the Environment Act 1995, it is allowed to transfer a discharge consent to another person who proposes to carry on the discharge in place of the existing holder.

Discharge charge

In case a discharge consent has been granted for discharges into controlled waters, a discharge charge is levied from the Environment Agency. This charge is meant to fully recover the

²⁶⁰ An important exception to the discharge consenting system is that it is not an offence to permit water to enter controlled waters from a mine that was abandoned before 31 December 1999. Any mine abandoned since this date is not covered by the exception.

costs, such as monitoring, encountered by the Environment Agency in fulfilling its pollution control function. The scheme includes both an application charge (payable on application for a new or revised consent) and an annual charge which is based on three factors, namely volume, content and receiving waters. For each factor, a series of bands has been established, to each of which a different weight applies which reflects the monitoring costs associated with that band²⁶¹. The charging mechanism implies that where dangerous substances are present in the discharge, the costs of the additional monitoring are passed on to the sewerage company. The charging scheme does not cover the costs of more general environmental monitoring nor pollution prevention and control work that is not directly related to specific discharges.

Trade effluent charge

In England and Wales, water companies levy charges for trade effluent discharged to sewers on the basis of the so-called Mogden formula, which links charges to the costs of treating effluents. Dischargers pay according to the volume and strength of the effluent that they discharge²⁶². Charges are calculated on a company-wide basis rather than being plant-specific.

Target groups of the different instruments:

- Household and non-household customers are the target group of sewerage charges;
- Discharge consents and the connected discharge charge are targeted at any consent holder (e.g. sewerage companies, industry).

Actors of Implementation:

- The **Environment Agency** is responsible for pollution control and resource management, and issues licences for discharges.

²⁶¹ The charging system gives greater weight to larger volumes, more sophisticated effluents and the complexity of monitoring given the nature of the receiving waters.

²⁶² For more detailed information on the exact composition and application of the Mogden formula, please refer to the following website of the Department for Environment, Food and Rural Affairs: [<http://www.defra.gov.uk/environment/envrwp/water/13.htm>].

- **Ofwat** is responsible for the economic regulation of the water companies in terms of price limits for sewerage services and levels of services.
- The **sewage treatment service providers** are responsible for maintaining and improving the public sewers which serve most of the UK population.
- Disputes between Ofwat and the companies it regulates are mediated by the **Monopolies and Mergers Commission**, or at the highest level by the Minister of Commerce in his role as the head of the Board of Trade.
- The **Environment Agency**, the **Scottish Environment Protection Agency** and the **Environment and Heritage Service** of the Department of the Environment for Northern Ireland are the environmental regulators that regulate discharges from waste water treatment works and combined sewer overflows.

Rationale (overall approach):

If we regulate and monitor discharges to the aquatic environment, we can improve the water environment and ensure sustainability of the resource and its quality.

Policy Outcomes:

About 94% of the UK population is connected to sewers leading to sewage treatment plants, of which 11% are of preliminary treatment; 13% are with mechanical treatment, i.e. primary level; 55% have biological treatment, i.e. secondary level; and 21% are of advanced treatment, i.e. tertiary level (DEFRA, 2002a). Compared to other European countries, this rate of tertiary treatment is exceptionally low (European Communities, 2003). Most of the remaining population is served by small private treatment works, cesspits or septic tanks (DEFRA, 2002a). Table 9-3 provides some key figures on the sewerage collection and treatment system in the UK.



Table 9-3: Sewerage Collection and Treatment (1998)

	UK	England & Wales	Scotland	Northern Ireland
Population connected to the sewer system (1998)	94%	96%	93%	83%
Population served by sewerage treatment works to sea outfalls (1998)				
Preliminary / none	11%	10%	15%	n/a
Primary	13%	12%	25%	n/a
Secondary	55%	55%	59%	n/a
Tertiary	21%	23%	1%	n/a
Sewage treatment works (1998)		6415	1927	918
Sewers, Km (1998)		313,663	30,196	10,207

With regard to discharge permits, the Environment Agency estimates that there are approximately 30,000 numeric limited discharge consents in England and Wales, of which 10,000 are routinely monitored by the Agency.

9.3.4. Synthesis

9.3.4.1. Table(s) for the Comparison

The following table provides a summary of the instruments applied in the different stages of water services provision, their target groups and the implementing actors, in the same chronology as described above.



Table 9-4: Synthesis – England & Wales

Public policy	Objectives	Instruments (prescriptive, regulative, incentive, informative, self-regulative)	Target groups	Actors of implementation
1. Resource access	Prevent over-abstraction and improve control over the environmental effects of water abstraction Ensure a fair and efficient allocation of water between competing local demands Contribute to maintaining and enhancing the quality of water dependent environments	<p><i>Reg.</i> Abstraction licenses Water Protection zones Sites of Special Scientific Interest (SSSI)</p> <p><i>Inc.</i> In case a licensed abstraction causes damage or loss to anyone, he is entitled to compensation from the abstractor;</p> <p><i>Abstraction charges have a volumetric component, setting incentives to lower water abstraction;</i></p> <p><i>Inf.</i> Applications for abstraction licenses need to be brought to the attention of those likely to be affected;</p>	Any abstractor that does not qualify for one of the exceptions under the Water Act 2003 Owners and authorised users of land	EA Secretary of State (DEFRA)
2. Production / Distribution	Ensure efficient provision of good quality drinking water and compliance with national and EU regulations at affordable prices for consumers through quality standards and controls, charges regulation, monitoring and transparent public information policies	<p><i>Reg.</i> Quality standards pursuant to the Water Industry Act 1991 Monitoring the quality of drinking water supplied Water companies have to submit work programmes that outline how they will manage to comply with standards;</p> <p><i>Inc.</i> Sanctions pursuant to the Water Industry Act 1991 Water price (incentive effect is low for most household users, as metering is not widespread)</p> <p><i>Inf.</i> Publishing the results of monitoring (service providers and authorities)</p> <p><i>Self-reg.</i> Water companies are to self-control drinking water quality</p>	Water supply companies All customer groups	Secretary of State (DEFRA) / NAW DWI EA Ofwat
3. Sewerage collection and treatment	Ensure the provision of sewerage collection and treatment through controls and monitoring devices financed through (financial) cost covering charges.	<p><i>Reg.</i> Pollution monitoring Discharge consent</p> <p><i>Inc.</i> Sewerage charges Discharge charge raised in case that the agency has granted a discharges consent Charge on trade effluent discharged into the sewer; charges are linked to the cost of treatment (harmfulness);</p>	Sewage treatment companies Household and non-household customers, dischargers	EA Ofwat

9.3.4.2. National Model? Main Characteristics

The following characteristics are key to the system of water management in England and Wales and describe the typicality of the “England & Wales Model”:

- Municipalities in England & Wales are no longer responsible for water service provision – an exception to the rule in the European Union. In 1989, the provision of water services in England and Wales was **privatised, and statutory undertakers** that obtained licences for 25 years are now responsible for the abstraction, production and distribution of drinking water and the collection and treatment of wastewater. Each service provider operates as a **vertically integrated local monopoly**. Vertical competition is accordingly very low.
- A strong regulatory framework developed alongside the privatisation of service provision and resulted in **three new independent regulating institutions**:
 - The economic regulator *Ofwat*, is responsible for ensuring proper activity on the part of the companies; protecting consumer interests; ensuring companies' financial viability; promoting the efficiency and economy of companies; and promoting effective competition;
 - The *Environment Agency* is the environmental regulator concerned with, e.g. licensing and monitoring water abstractions and discharges; and
 - The *Drinking Water Inspectorate* is responsible for ensuring compliance with drinking water quality standards.
- The application of **price cap regulation, combined with yardstick competition**, constitutes a further outstanding feature of the system. In the absence of effective market competition, Ofwat, the economic regulator, bases its decision on setting price limits and standards of services on comparative competition (see Box 9-7).
- Four main ways have been introduced to promote competition within the privatised local monopoly system, namely through inset appointments, cross-border supplies, unregulated supplies and common carriage (see Box 9-2).

The water sector in England and Wales is thus a privatised system of vertically integrated local monopolies, no role for local municipalities and with a strong position and responsibility of the three regulating institutions.

9.4. FUTURE TRENDS IN WATER PLANNING AND MANAGEMENT

The present system of privatised service provision in England and Wales has in its basic features been accepted by all actors involved²⁶³. One can speak of a general consensus at the national level that re-introducing public ownership of water systems or management is not considered a viable policy option. While NGOs and other civil society actors raise a range of issues that they consider apt for change, they do not go as far as to promote a different model of service provision. In particular, local authorities, which have not been involved in water management issues for about 30 years, cannot be considered a source of political initiative for change²⁶⁴, as one might assume when considering the municipality-based service provision in most EU Member States.

The focus of discussion clearly lies on how the present framework of competition could be further enhanced in order to mitigate its shortcomings and to improve both the quality of services provided to consumers as well as the efficiency of provision.

One proposal for restructuring, which has been made by the water companies themselves²⁶⁵, entails splitting the physical network assets of the water system itself, with private companies adopting the role of operators under a version of delegated management. While different propositions have been made in this respect, they all contain the following two key elements²⁶⁶:

²⁶³ See also Green, 2001.

²⁶⁴ D. Hall and E. Lobina in: Schönbäck et. al. (2003a).

²⁶⁵ The water companies Kelda (Yorkshire) and Welsh Water were first in making such a proposal, but others have followed suit since then (e.g. Wessex Water or Anglian Water) and shown interest in such a re-organisation.

²⁶⁶ D. Hall and E. Lobina in: Schönbäck et. al. (2003a).

- The physical infrastructure of the network itself is sold to a not-for-profit body, which then finances capital investment through borrowing;
- The operation of the system is contracted out to another expert water company to run with a long-term lease or concession.

These proposals originate from the fact that private service companies have increasingly come under economic pressure due to measures that squeezed their profitability (e.g. more stringent price caps imposed by Ofwat since the 1999 price review, stricter social regulations to which the companies have to adhere, regarding for example supply cuts, etc.)²⁶⁷.

With the Water Act 2003, the government has introduced a new way to further competition: New entrants will be given the opportunity to supply water to large commercial and industrial customers. A system to licence new entrants will be established, which will regulate the relationship between the new entrant and the appointed undertaker and simultaneously ensure coherent water resource planning and continuing water quality standards. The eligibility threshold will initially be set at an annual consumption of 50 megalitres²⁶⁸.

9.5. CONCLUSION

This report analysed the historical development of the water sector in the UK over the past 100 years, including its legislative requirements and regulations, the sectoral organisation, as well as the underlying policy rationales. The analysis outlined the main actors and stakeholders involved in the UK water cycle and detailed their frame of action. Due to the unique evolution of the water sector in England and Wales, the investigation of instruments currently in place for water management, their target groups and the implementing actors concentrated on the case of England and Wales.

²⁶⁷ Schönbäck et. al. (2003a).

²⁶⁸ Environment Daily 1558, 21-11-2003.

The description and analysis of the water sector of England and Wales has led to its characterisation as a “privatised system of vertically integrated local monopolies, with no role for local municipalities and a strong position and responsibility of regulating institutions”. The final discussion on the present status of debate in England and Wales regarding the water sector’s organisation has shown that the present system of privatised service provision has in its fundamentals been accepted by all actors involved, and that re-introducing public ownership of water systems or management is not considered an option. Instead, the focus of discussion is on how the present framework of competition could be further enhanced in order to limit its observed deficiencies and to improve the quality of the service provided to the consumer as well as its efficiency of provision. It can therefore be expected that the future focus will be on incremental improvements in the existing regulatory system (e.g. aiming at further increasing its transparency).

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10. CHAPTER 10: COUNTRY REPORT BELGIUM

DAVID AUBIN AND FRÉDÉRIC VARONE

10.1. INTRODUCTION

The presentation of the Belgian legislation on water supply and sanitation (WSS) is made through an analysis of the sectorial actors and of the regulatory framework within which they evolve. It includes institutional and legal aspects, i.e. the evolution of water legislation, the different actors involved, the decision-making process and the repartition of policy competencies and responsibilities. Our analysis focuses on the public/administrative regulatory framework of the WSS sector with the goal to conduct a comparative analysis of nine EU countries: Belgium, France, Spain, The Netherlands, Sweden, Italy, Portugal, Germany and the UK (see WP4 comparison). Our central research question is the following: Which trend do we observe towards harmonisation and liberalisation in the WSS sector? Our study concentrates on legal matters. We analyse the content of the legislation in force, i.e. all pieces of legislation formally adopted by July 1st, 2003. Pending legislation is analysed separately. From this legal description, we conduct a policy analysis of the legislation and emerging regulation in the WSS sector. This analysis concentrates on five constitutive elements of a public policy: (1) Objectives; (2) Instruments; (3) Target Groups; (4) Implementers; and (5) Action logic (rationale of the policy). We also attempt to assess the effects (outputs and outcomes) of the WSS policies.

What are the characteristics of Belgium? Belgium faces multiple challenges concerning water management in a broad sense (not only WSS sector indeed). Pollution in most water streams is persisting. It comes from discharges of diverse sectors, mainly from agriculture and households. In 1995, only 28% of domestic waste water is treated (OCDE 1998: 84), while the European Union (EU) requires conformation to the set of water directives. These obligations increase the financing needs while the country is already indebted and must conform to the objectives of the European and Monetary Union (EMU). While hydric stress is important (Gleick 1993), the water resource is distributed unequally between the three regions. Both Flanders (at 25%) and Brussels-Capital (at 100%) are dependent from Wallonia

for drinking water provision. Wallonia benefits from the main aquifers. Policies and structure of the sector are deeply influenced by this specific context.

A broad contextualisation of the history of water policies and the actors precedes the detailed description of the current WWS policies. The report ends with a broadening of the perspectives through an assessment of future trends. First we briefly present the history of the regulation and the repartition of competencies (Part 10.2). We make a general description of the history of water laws (Part 10.2.1), describe the different public authorities (Part 0) and the main actors (Part 10.2.2) involved in water management for each of the three Belgian regions, i.e. Flanders, Wallonia and Brussels-Capital. The analysis of the current legislation constitutes the core of the report (Part 0). Our policy analysis divides the WSS sector in five areas: resource access (Part 10.3.1), production (Part 10.3.2), supply (Part 10.3.3), sewerage (Part 10.3.4) and treatment (Part 10.3.5). The legislation of each Region is analysed in details. After a short synthesis, that gives an overview of the main trends at national level (Part 10.4.1), we present the future expectations from water legislation in Belgium (Part 10.4.2). We conclude with a presentation of the main challenges that a shift to integrated water management creates.

10.2. HISTORY OF REGULATION AND REPARTITION OF THE COMPETENCIES

10.2.1. General description of the history of water laws

In the last decades, water management and environmental policies faced crucial changes in Belgium. First the decision-making system on these issues is federalised in the 1980s²⁶⁹. Consequently, any analysis of water issues in Belgium has to consider three regional policies regarding Flanders, Wallonia and the Region of Brussels-Capital since then. In each region, water management is on the way of integration. However, the respective policies of water supply and sanitation have been considered rather independently. In a region, sewage activities are embedded in a global water quality policy (Flanders). In another, a company

²⁶⁹ Residual competencies remain in the hands of the Federal State (e.g., ionised radiations, control of prices, etc.).

supervises the whole WSS sector, but operation remains in the hand of distinct operators (Wallonia). In Brussels-Capital, integration is yet to be done.

(1) To get forth back in time, a policy in the WSS sector has developed since 1893. Years before, Belgian municipalities in main towns had built WSS networks (supply and sewerage) on their own (e.g. Brussels in 1852 and Liège) or delegated to individuals. This initial organisation of the sector led to a poor quality of the water provided, a weak suburban extension of the networks and exclusion of the most part of the population (increased by the cutting of fountains) (Cornut 2000; Viré 1986). Since 1893 the change is induced by the official perception of major river pollution problems and weaknesses in public health. A nation-wide enquiry about water supply is published in 1902. The government reports, called the André's reports²⁷⁰, attest that only 20% of housings are supplied with distribution water and that a major part of Flanders is supplied with rainwater or water withdrawn in ponds. It calls for a sanitary law. The Central State recognises the right of communes to associate in order to set distribution networks in common. The law of 1907 sets the legal frame of the inter-communal associations (*intercommunales*), and attributes subsidies. In complement, a national water distribution company, the *Société nationale de Distribution d'Eau* (SNDE) is created in 1913. During the period, the causal hypothesis which underlies the public intervention is: *If we develop public water distribution and regulate the sale of water products, then we will improve public health.*

(2) After the Second World War, the building of distribution networks is not yet finished²⁷¹. Works on infrastructure are still carried on for years, while the policy design is reoriented towards punctual water protection (1945-1963). Persistent pollution of streams (Escaut, Vesdre, Senne) and frequent floods are observed. The law of 1950 on the protection of water against pollution establishes a general prohibition of direct discharges in surface water and an authorisation procedure for industrial discharges. Communes are charged to realise programs of treatment. Then public health remains the priority, but new concerns are merged into the policy rationale: *If we limit industrial discharges and we strengthen the evacuation of water by cleaning out watercourses, then we will improve public health and the productivity of*

²⁷⁰ André J. B., 1902 &1906, *Enquête sur les eaux alimentaires*, Bruxelles, ministère de l'Agriculture.

²⁷¹ In 1947 the rate of connection to water distribution networks is 56% (Cornut 2000: 68).

agriculture. The implementation of the legislation is led by the Minister of Public Health, designated as the central actor in pollution problems. The measures remain sectoral and lead to a failure: despite the fact that they receive subsidies from the Central State, the communes do not see any interest in investing in water treatment at the benefit of downstream communes.

(3) Because of this failure, the Central State redefines its intervention strategy and organises public action in favour of a more systematic water protection (1963-1982). The problem of a generalised pollution of rivers, because of a lack of treatment, and the problem of frequent floods of fields are persistent. The government nominates a commission, the *Commissariat royal aux Problèmes de l'Eau*, to work on this matter. Its report warns the government against possible drinking water shortages. The resulting new policy model is: *If we protect springs and wells and we purify wastewater, then we will secure water supply and strengthen public health*. The model is translated in the legislation with the law of 1971 on the protection of surface and groundwater. The Central State reinforces its competence to the detriment of the communes. The Minister of Public Health promotes the creation of three public companies of treatment. The territory of the companies corresponds to three water basins (the Coast, river Meuse and river Escaut), and not to the three Belgian regions (Flanders, Wallonia and Brussels). The main instruments are a general prohibition of pollution unless prior authorisations for discharges are granted, fees and subsidies. The main weakness of this reform is that it did not anticipate broader institutional changes in Belgium, i.e. the federalisation process launched in 1970. The law on groundwater has not been implemented and the basin companies have never been settled properly.

From 1974 onwards, water competencies enter progressively in the jurisdiction of the Regions. Then each Region reconsiders the current water framework according to its own interests and culture. Flanders partially implements the law on surface water. The *Waterzuivering Maatschappij van het Kustbekken* (VZK), is created in 1975 for the coast territory and an Escaut/Meuse treatment company, the *Vlaamse Waterzuiveringsmaatschappij* (VWZ) in 1981. The municipalities are expropriated of their treatment plants at the benefit of these two authorities. In Wallonia, the national minister of Walloon Affairs bypasses the institutional arrangement of the law of 1971 and gives in 1977 the task to treat wastewater to eight inter-communal associations of water treatment (*intercommunales*). Thus the



intercommunales become effectively the recipients of State subsidies. Treatment plants are then subsidised at a 100% level. The first discrepancies between the two regions are effective.

(4) Following the special law of institutional reform of 1980, autonomous regional administrations are put in place and, consequently, water regional policies are deepened. **Flanders** enters in a policy of water independence (1982-1990). Its water provision is at that moment dependent at 60% from Wallonia. The law of 1971 on the protection of surface water is maintained and completed with decrees on the protection of groundwater and on environmental permission. The Flemish policy design is based on this assumption: *If we protect wells from (diffuse) pollution and we regulate discharges through global permissions, then we will develop our own capacities to product drinking water.* A prohibition of spreading manure from abroad and the environmental permission are introduced. The Region levies fees on industrial emissions and taxes on households in order to finance water treatment. It confirms its leading role in water policy with a complete review of the former institutional arrangement. First, the *Vlaamse Maatschappij voor Watervoorziening* (VMW), i.e. the Flemish water distribution company is created in 1983. Second, a single authority becomes competent in water treatment, the '*Vlaams Maatschappij voor Waterzuivering*' (VMZ). The picture is different in **Wallonia** (1982-1995). The Region does not implement the laws of 1971 and waits until 1985 to rule the protection of surface water and 1990 for groundwater. Over the period, the objectives are to preserve the quality of every potential drinking water (surface and groundwater) (*eau potabilisable*). The intervention hypothesis becomes: *If we protect wells, we regulate discharges and we plan the restoring of streams, then we will preserve the quality of potential drinking water and the tourist attractiveness of streams.* The reform leaves a bigger room to the local authorities than in Flanders. Communes are highly involved through the inter-communal associations (or *intercommunales*) of production/distribution and of water treatment. Innovations are set in the field of policy instruments. Taxation systems are developed towards industries and households in order to finance water protection measures, i.e. financing of treatment plants and protection perimeters of wells. The main difference between Flanders and Wallonia during this period is that actors involved in water treatment are less numerous in Flanders. The **Region of Brussels-Capital**, an urban area on the whole, is more focused on treatment and water access (1989 onwards). The rationale of its intervention is that: *If we preserve groundwater and surface water from*

the pollution with environmental permits and natural areas, then their quality enhances and we guaranty a better access to water to all including for recreation purposes. For years, the regional water policy, based on the laws of 1971, has been focused on the financing of two huge treatment plants in respect of the 1991 directive on urban wastewater. The institutional arrangement for the implementation of the water policy is very fragmented.

(5) If the current policy design in Brussels remains partial, Flanders and Wallonia operated a last change that consolidated the design of their on-going water policy. As a reaction to the persistent pollution of rivers and to European obligations, **Flanders** decides to partly privatise its treatment activities and to extend the regulation of discharges to new users (since 1990). The new causal hypothesis is that *if we intensify water treatment, regulate discharges through global permission, limit manure spreading and define absolute protection zones, then we will improve our reserves of potential drinking water and preserve ecosystems and bio-diversity.* The list of target groups is particularly extended to farmers. The spreading of manure in fields is severely regulated. Nevertheless the main change in the period consists in a complete restructuring of the implementation structure of the policy. **Wallonia** chooses to reinforce water protection measures with a process of contractualisation between the regional authority and the water operators (since 1995). The policy rationale is: *If we intensify water treatment and we regulate discharges and protect specific areas through global permissions, then we will preserve the quality of potential drinking water.* As in Flanders, the main change concerns the institutional arrangement. The whole cycle of drinking water is integrated in a coherent framework supervised by the *Société publique de gestion de l'eau* (SPGE).



Table 10-1: Phases in the development of the policy design concerning water policy in Belgium

Phases	Policy design	Actors of implementation
1. 1893-1945: Widening of distribution networks	<p><u>Objectives</u>: organise a good water supply, protect groundwater partially, monitor the quality of water products</p> <p><u>Causal Hypothesis</u>: if we develop public water distribution and regulate the sale of water products, then we will improve public health</p> <p><u>Instruments</u>: legal framework and subsidies to develop public water distribution, protection of wells and limitation of competition, some interdictions of withdrawing and discharging in navigable rivers</p> <p><u>Target groups</u>: communes, riparian landowners, mineral water producers, boatmen</p>	Ministers of Agriculture, Public Works, and Internal Affairs, Government
2. 1945-1963: Punctual water protection against pollution	<p><u>Objectives</u>: reduce the pressure on surface water due to the development of the industry and clean out waterbeds for the drainage of fields</p> <p><u>Causal Hypothesis</u>: if we limit industrial discharges and we strengthen the evacuation of water by cleaning out watercourses, then we will improve public health and the productivity of agriculture</p> <p><u>Instruments</u>: general prohibition of pollution, prior authorisation for discharges, authorisation for works, subsidies for cleaning out</p> <p><u>Target groups</u>: industries, communes, riparian landowners</p>	Ministers of Public Health, Agriculture, and Public Works, provinces, communes, <i>polders</i> and <i>wateringues</i>
3. 1963-1982: Systematic water protection	<p><u>Objectives</u>: reduce the pollution problems due to petrol depots and other hazardous products, strengthen the implementation of the ongoing legislation and satisfy growing needs of water</p> <p><u>Causal Hypothesis</u>: if we protect springs and wells and we purify waste water, then we will secure water supply and strengthen public health</p> <p><u>Instruments</u>: cleaning out by public authorities, general prohibition of pollution and prior authorisation for discharge, subsidies for building of public and private (industrial) treatment plants, fees on discharges for industries and taxation of households</p> <p><u>Target groups</u>: riparian landowners, <i>polders</i> and <i>wateringues</i>, communes, provinces, water companies, petrol companies, farmers, industries, entrepreneurs</p>	Ministers of Agriculture and Public Health, provinces, communes, <i>intercommunales</i> in Wallonia (1977) and basin companies in Flanders
4. Regionalisation of the water policy		
4a. 1982-1990: Flanders	<p><u>Objectives</u>: preserve the quality of every potential drinking water (surface and groundwater) and limit imports from Wallonia</p> <p><u>Causal Hypothesis</u>: if we protect wells from (diffuse) pollution and we regulate discharges through global permissions, then we will develop our own capacities to product drinking water</p> <p><u>Instruments</u>: protection zones, general prohibition and authorisation of discharges and deposit in water and on the ground, prohibition of spreading of manure coming from abroad, classification of production plants, environmental exploitation permit, twinning of the environmental permission with the planning permission, (fees on discharge for industries and taxation of households for water treatment in application of the 1971 law)</p> <p><u>Target groups</u>: water producers, farmers, industries, households</p>	Regional executive, provinces, communes
4b. 1982-1995: Wallonia	<p><u>Objectives</u>: preserve the quality of every potential drinking water (surface and groundwater) and get rational management</p> <p><u>Causal Hypothesis</u>: If we protect wells, we regulate discharges and we plan the restoring of streams, then we will preserve the quality of potential drinking water and the tourist attractiveness of streams</p> <p><u>Instruments</u>: protection zones, general prohibition and authorisation of discharge and deposit in water and on the ground, prohibition of discharge of hazardous products in groundwater, fees on withdrawing, fees on discharge for industries and taxation of households for water treatment, taxation of exports, subsidies for treatment plants to the <i>intercommunales</i> and industries</p> <p><u>Target groups</u>: <i>intercommunales</i> of water production, industries, intensive breeding, households, boatmen, communes, <i>intercommunales</i> of treatment</p>	Regional executive, communes, water distributors (tax collection), <i>Inspection générale de l'Eau</i> (regional administration), regional taxation office
4c Since 1982: Region of Brussels-Capital	<p><u>Objectives</u>: rationalise the environmental management, improve water quality, respect the European requirements and guarantee the supply with drinking water to anybody</p> <p><u>Causal hypothesis</u>: if we preserve groundwater and surface water from the pollution with environmental permits and natural areas, then their quality enhances and we guaranty a better access to water to all including for recreation purposes</p> <p><u>Instruments</u>: environmental exploitation permit, prohibition of interruptions in water supply, fees on emissions, subsidies for investments in treatment plants</p> <p><u>Target groups</u>: industries, IBDE, entrepreneurs, farmers, boatmen, fishermen, households</p>	Regional executive, regional administrations including IBGE, CIBE-IBDE (water producer), communes
5. Deepening the regional policies		
5a. 1990: Flanders	<p><u>Objectives</u>: react against persistent pollution of aquifers through a complete restructuring of the implementation of the Flemish legislation</p> <p><u>Causal Hypothesis</u>: if we intensify water treatment, regulate discharges through global permission, limit manure spreading and define absolute protection zones, then we will improve our reserves of potential drinking water and preserve ecosystems and biodiversity</p> <p><u>Instruments</u>: annual inventory of emissions of pollutants, fees on discharges for industries and taxation of households for water treatment, limitation of manure spreading, natural protection zones</p> <p><u>Target groups</u>: farmers, industries, households</p>	Regional executive, <i>Mestbank</i> (VLM), AMINAL, VMM, Aquafin
5b 1995: Wallonia	<p><u>Objectives</u>: restructure the water sector (production, distribution, treatment), conform to the European requirements, set a global and integrated water management</p> <p><u>Causal Hypothesis</u>: if we intensify water treatment and we regulate discharges and protect specific areas through global permissions, then we will preserve the quality of potential drinking water</p> <p><u>Instruments</u>: classification of production plants, environmental exploitation permit, twinning of the environmental permission with the planning permission, fees on harnessing or contract between water producers and the SPGE, full-cost pricing</p> <p><u>Target Groups</u>: industries, farmers, boatmen, communes, <i>intercommunales</i> of production and treatment, households</p>	Regional executive, DGRNE, DGATL, SPGE, water distributors, communes



As a conclusion, we observe that water policy in Belgium has evolved with concerns in public health tied to the movement of hygienism of the late 19th Century (see Table 10-1). Environmental concerns come much later. In a first period (1893-1950), public authorities promote the municipal development of water distribution and sewerage. Wastewater is directly discharged in rivers. Since the late 1940s, people observe an important pollution of water streams. This is due to direct discharges of industries and households combined to the high density of population. Such dispersion of wastewater threatens human health and, more particularly the availability of potential drinking water in a context of an exponential growth of the demand (1960s). The reaction (1950-1982) consists in financing the construction of treatment plants. The successive policies fail due to a lack of public investment for the communes and latter to political struggles between the Regions in a context of institutional reforms. The growing concerns for the protection of ecosystems have been considered since the mid-1980s (1982-onwards), while public health and a secure water provision remain central. The rationale of the current regional water policies is also much influenced by the compliance to the EU.

10.2.2. Repartition of the policy competencies in the country

Whilst a unitary State since its creation, Belgium engages in a gradual process towards federalism in 1970. The current system is bipolar and asymmetrical. It is based on two different kinds of federated entities: three Regions (Flemish, Walloon, and Brussels-Capital) which are in charge of economic matters and three Communities (French, Flemish and German-speaking) which deal with personified matters (culture, social matters & education). The Regions and Communities are formally set up in the 1970s, and since 1980 (1989 for the Region of Brussels-Capital) the Walloon and Flemish Regions have become autonomous, governed by their own assembly and executive. Further transfers of competencies are made in 1988. Since 1993, Belgium is a federal State (first autonomous elections). Regions and Communities are added to the already existing levels of administration, and take place in the territorial hierarchy between the Federal State and the lower levels of the Provinces (10 since 1993) and the communes (589). The Regions are originally responsible for economic development, regional development, environmental protection and housing. Their competencies are extended in 1988 to public transportation, public works and to the financing

of subordinate bodies. Regions are thus the central actors of the water management since 1980, with a few exceptions²⁷².

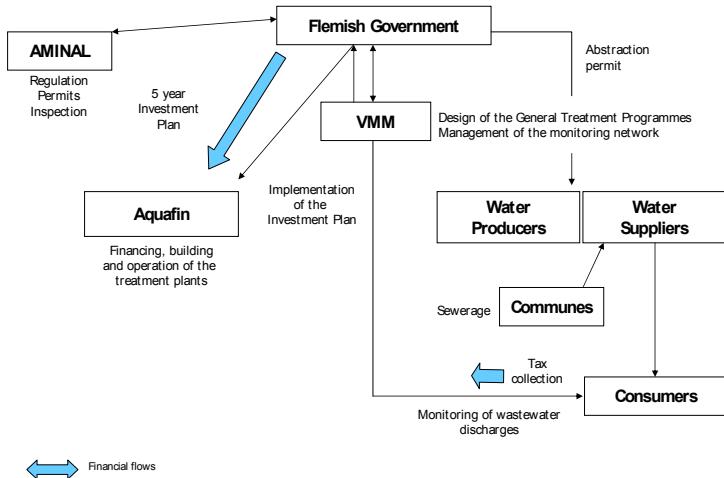
Water competencies are concentrated in two specialised regional administrations. In Flanders, the management of water quality and drinking water belongs to AMINAL (i.e. monitory of surface and groundwater quality, authorisation of discharges, supervision of investment plans for water treatment, etc.). The management of river flows and navigation belongs to AWZ (*Administratie Waterwegen en Zeewezen*). In Wallonia, the organisation is similar. Water quality and management of secondary rivers belongs to DGRNE (i.e. taxation, authorisation of withdrawals and discharges, integrated water policy design). Some residual competencies are dispersed through different administrative bodies (e.g. supervision of the *intercommunales*, regulation of manure spreading, location of industrial activities and housings, etc.). Another regional level, the Community, is responsible for social matters (so as social funds for public intervention in the payment of water bills). Despite the regionalisation process, some residual competencies remain in the hands of the Federal State. The ministry of Public Health monitors food quality (including the quality of mineral water) and measures radioactivity. The ministry of the Economy also still does price control on water prices (prior consent to price increase, a price generally determined by the communes). Last but not least, the communes are responsible of price setting and sewerage.

10.2.3. Main actors involved

The historical choice of a communal public water service is challenged. Regulation is increasing, particularly for the quality of drinking water, due to EU pressure. The growing needs for investment and know-how lead to the opening of water management to private interests. This trend is reflected on the bill of the consumers. Price increase may become a more sensitive debate than privatisation. As water management is regionalised since 1980, we systematically present separate analyses for each Region. The evolution of water management in the three Regions diverges.

²⁷² The Federal State is still competent for matters such as the determination of norms of radioactivity in the water.

Figure 10-1: Organisation of water actors in Flanders



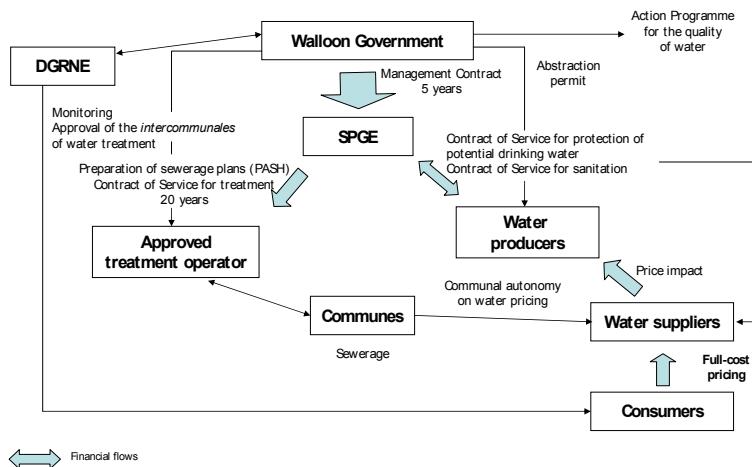
Source: Adapted from Aubin & Varone (2001: 54)

In Flanders, AMINAL (*Administratie Milieu-, Natuur-, Land- and Waterbeheer*) remains supervisor, but with little capacity (see Figure 10-1). A public company, the *Vlaamse Milieumaatschappij* (VMM) monitors water quality and decides on the localisation of sewage treatment plants. The number of drinking water suppliers is high and their statuses differ much: A regional company, the *Vlaamse Maatschappij voor Watervoorziening* (VMW) serves 176 communes (2,380,000 inhabitants, 40% of the population in the region). The remaining part is supplied by 7 inter-communal associations and 12 communal companies. Some operators in the distribution sector are constituted in public/private partnerships (with Aquinter and Electrabel, two daughter companies of Suez). Concerning treatment, a single operator, Aquafin, implements the regional treatment policy. NV Aquafin is a public/private partnership (PPP) that holds a monopoly on the whole region²⁷³. The competence remains in the hands of the communes in the areas representing a treatment capacity of less than 2,000 population-equivalent (p.e.). The rate of connection to a treatment work is of 52% in 2000.

²⁷³ The company is held at 20% by Severn Trent (UK), 29% by institutional investors and at 51% by the *Vlaamse Milieuholding* (i.e. the investment company of the Flemish Region).



Figure 10-2: Organisation of water actors in Wallonia



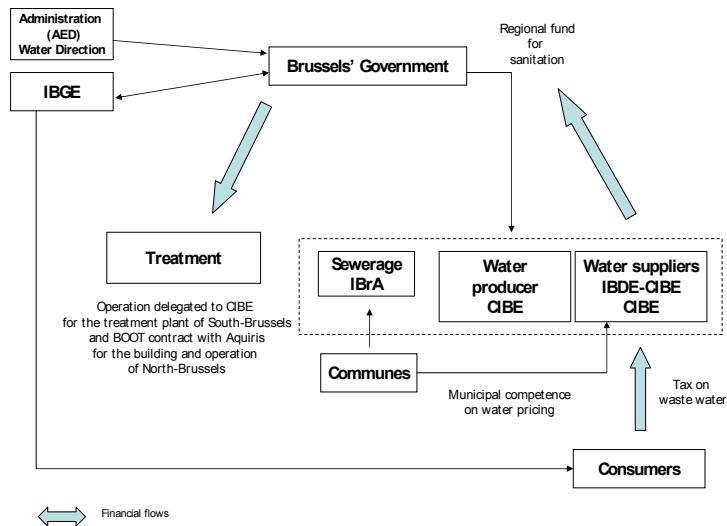
Source: Adapted from Aubin & Varone (2001: 57)

In Wallonia, the *direction générale des Ressources naturelles et de l'environnement* (DGRNE) has a competence limited to monitoring and police (see Figure 10-2). Since 1999, the *Société publique de gestion de l'eau* (SPGE) heads the WSS sector. With the aim to implement a full-cost pricing policy, it collects and distributes the money raised for water management, more precisely for sanitation and the protection of wells. The SPGE, a public company opened to private participation, contracts out with the operators²⁷⁴. Concerning water production and distribution the activity is shared between communal companies, *intercommunales* and the *Société wallonne des Eaux* (SWDE) that is the major water distributor in Wallonia, with 172 communes supplied (1,750,000 inhabitants or 60% of the population). In 2001, the company signed a management contract, negotiated with the Walloon Region. The remaining part of connections is managed by 18 inter-communal associations, 5 communal companies and 57 communal services. Water treatment is under the responsibility of 8 specific inter-communal associations. The activity is subsidised at 100%

²⁷⁴ The SPGE is held at 50% (+ 1 share) by the *Société de financement des eaux* (SFE) (Walloon Region and SWDE), at 24% by the *Société wallonne de l'eau* (SOWE) (regional water operators) and at 26% (- 1 share) by financial institutions, i.e. Dexia, SOCOFE and AUXIPAR.

by the Region. The rate of connection to a treatment plant rises from 25.4% in 1996 to 32% in 1999. 22% of the population in Wallonia uses an individual installation.

Figure 10-3: Organisation of water actors in Brussels



Source: Adapted from Aubin & Varone (2001: 51)

In the Region of Brussels-Capital (see Figure 10-3), the *Institut bruxellois pour la Gestion de l'Environnement* (IBGE) monitors the quality of water for the Region and collects the taxes on discharges. The *Administration de l'Equipement et des Déplacements* (AED) remains responsible of wastewater treatment. The historical operator in Brussels is the *Compagnie intercommunale bruxelloise des Eaux* (CIBE). It produces drinking water from its own wells and plants in Wallonia. The CIBE is owned and managed by the 19 Brussels' communes. The activities of distribution in the Region are operated by the *Intercommunale bruxelloise de Distribution d'Eau* (IBDE), but still run by the CIBE. The current debate on the single price for water could lead to a merger between the three *intercommunales* (CIBE, IBDE and IBrA). Sewerage activities are under the competence of the new IBrA (*Intercommunale bruxelloise pour l'Assainissement*), an *intercommunale* operated by CIBE. Concerning wastewater treatment, there is still only one treatment plant in Brussels, South-Brussels, owned by the Region and operated by CIBE. Another one, North-Brussels, is under construction. It is

subject to a BOOT contract (build, own, operate and transfer) held by the consortium *Aquiris*, led by *Veolia Environment*²⁷⁵.

Broadly speaking, water management in Belgium is driven by the public sector. Regional companies (i.e. VMW and SWDE) and municipal companies (*intercommunales*) hold the activities of water production and distribution (see Table 10-2). Water treatment is either organised around a single regional company (Flanders) or specific *intercommunales* (Wallonia). In Brussels it is put under direct control of the operators. Supervision activities are either directly held by the regional administration or public companies. No independent regulatory authorities have been set up yet (however under development in Flanders).

²⁷⁵ To be more precise, Aquiris is a joint-venture between OTV-Veolia Water Systems (36.5%), Veolia Environment (former Vivendi Environment) (36.5%), Marubeni (20%) and other partners (7%).



Table 10-2: Main WSS companies in Belgium

	Production, 1995			Distribution, 1991			Treatment	
	Company	Volume (mio m³)	Share	Company	Volume sold (mio m³)	Share	Company	Population equivalent
Flanders	AWW	144	20%	VMW	105	19%	Aquafin NV	3,000,000
	VMW**	141	19%	AWW	93	16%		
	PIPDA	63	9%	PIDPA	63	11%		
	TMVW	13	2%	TMVW	31	5%		
				Régie de Gand***	15	3%		
<i>Sub-total</i>		361	49%		307	54%		
Brussels	CIBE**	141	19%	IBDE-BIWB	59	10%	CIBE	350,000
				CIBE-BIWM	9	2%	AQUIRIS	1,100,000
<i>Sub-total</i>		141	19%		68	12%		
Wallonia	SWDE	108	15%	SWDE	70	12%	AIDE	2,700,000
	ERPE*	35	5%	CILE	29	5%	IDEA	
	CILE	29	4%	IDEML-SWDE	8	1%	AIVE	
	IDEA	9	1%	Régie des Eaux de Charleroi	7	1%	INTERSUD	
	Régie des Eaux de Charleroi	7	1%				IBW	
							INASEP	
							IGRETEC	
							IPALLE	
<i>Sub-total</i>		188	26%		114	20%		
	Others (Belgium)	48	7%	Others (Belgium)	78	14%		
TOTAL		738	100%		567	100%		

* ERPE has been transferred to the SWDE; ** Many companies in Flanders and Brussels produce water in Wallonia; *** Operated by TMVW since 2002

Source: (Cornut 2000: 79)

Partial privatisation nevertheless occurred in the three Regions. Flanders set up a public-private partnership (NV Aquafin) to finance and conduct its water treatment policy. Wallonia opened the capital of its regional water management company (SPGE) to private interests (i.e. financial institutions). Brussels-Capital is building a huge treatment plant through a BOOT contract (Aquiris). The water sector is then opening up to privatisation, a trend more or less strictly enclosed in the legislation. The Regions have the hand on the process while at the same time municipalities keep the possibility to contract with private operators for their own water services. More, they assure the broad supervision of the sector, while the operators monitor their activities by themselves, the quality of drinking water for instance.

Each year, Belgium (three regions) produces 730mio m³ drinking water that are supplied to households, industry and agriculture. 34% are produced from raw surface water, mainly from the Meuse (or Albert Canal which is fed by the Meuse) and necessitate a heavy drinking water treatment. Surface water is needed to limit over exploitation of existing aquifers and also for more political reasons. Nowadays, aquifers in Belgium are exploited at a rate of 75% of their renewability. While Wallonia exerts not much pressure on the groundwater resource, Flanders wants to intensify drinking water production from surface water. The Flemish Region wants to reduce all kinds of withdrawals in aquifers in order to constitute reserves and avoid salination near the Coast. More production from surface water would also make it autonomous from Wallonia, a policy in place since the 1980s. In fact, at a national scale, the current production capacity is sufficient for the country, as water consumption is stabilised (even in low decline). Given the high density of population, consumption per capita is relatively low with 112l per year. Moreover, production in Wallonia is already in overcapacity.

10.3. ANALYSIS OF REGULATION OF THE WATER SECTOR IN THE COUNTRY

For each part of the sector, we conduct a policy analysis, attempting to make clear the rationale (intervention logic) of the water policy. To that end, we identify a series of elements in the relevant pieces of legislation, i.e. objectives, instruments, target groups, actors of implementation, causal logic and effects.



10.3.1. Resource access

How can an operator have access to the resource in order to produce drinking water?

10.3.1.1. Property rights on the water resource

Ownership on water is particularly interesting when we talk about the water resource. Ownership rights on water are consigned in the Civil Code (CC). Concerning the WSS sector the question is limited to two aspects: ownership of the water in pipes and access possibilities to potential drinking water sources. Concerning the first aspects, the water that flows in pipes is held in private property. The owner of the pipe is the owner of water. Here water is a private good that can be sold at market price.

Table 10-3: Summary of the structure of ownership of water bodies in Belgium

	Surface water	Springs	Groundwater
Formal ownership rights	<p>Running water is public (art. 714 CC)</p> <p><u>Navigable rivers</u>: State property (public domain) (Regions since 1980) (art. 538 CC). Banks belong to the riparian landowners (private).</p> <p><u>Non-navigable rivers</u>: presumption of public property for the riverbed and private property for the banks (related to land ownership)</p> <p>Exception for NNR of 2nd cat. and al. inside the <i>polders</i> and <i>wateringues</i> (common property)</p> <p><u>Ponds and wetlands</u>: private property</p> <p><u>Water in pipes</u>: private property</p>	Private. Related to land ownership (principle of access)	Related to land ownership (principle of access, art. 552 CC)
Disposition rights	<p><u>Navigable rivers</u>: the State gives concessions or administrative authorisations</p> <p><u>Non-navigable rivers</u>: owned by the riparian landowners</p> <p><u>Ponds and wetlands</u>: owned by the landowner (limited by regulations)</p>	Private. Limited in the interest of the common good (art. 643 CC)	Private but limited by regulations. Prior authorisations for pumping. Monopolies conceded by the communes for mineral water sources and aquifers
Use rights	<p>The State owns the fishing rights (permission system)</p> <p><u>Navigable rivers</u>: depends on the disposition rights of the State</p> <p><u>Non-navigable rivers</u>: All other uses owned by the riparian landowners for non-navigable rivers.</p> <p><u>Ponds and wetlands</u>: to the landowner (can be limited by the regulation)</p>	Private. Limited by the disposition rights	Private. Limited by the disposition rights Limitation of indirect uses (manure spreading)

Source: Aubin & Varone (2004)

Concerning raw water the question is a bit trickier (see Table 10-3). Groundwater abstraction is tied to land ownership according to the principle of access (art. 552 CC). It means that only

the landowner has the right to dig a well. He has also the possibility to give (or hire) his consent to withdraw water on his land. About surface water, the situation differs according to the water body. We distinguish the springs, non-navigable rivers and navigable rivers. Concerning the springs, they are private properties. The landowner has the full disposition rights on them. Concerning the non-navigable rivers, the right of withdrawal belongs to the riparian landowner. Finally, withdrawals in navigable rivers are subject to a concession given by the State. As such, access to potential drinking water is far from evident. Any water producer needs either a property right on land or a concession from a landowner or the State.

10.3.1.2. Public policies about resource access

Flanders

Legislation in force

National law of 26 March 1971 about the protection of water against the pollution
 Regional act of 28 June 1983 establishing the regional water company (capacity of expropriation)
 Regional act of 24 January 1984 on groundwater
 Regional act of 28 June 1985 about environmental permission (+ Vlarem 1 & 2)
 Regional act of 23 January 1991 about manure spreading (*mestdecreet*) (reform 1994-1995)
 Regional act of 6 July 2001 about the *intercommunales*
 Regional act of 9 July 2003 about integrated water management

Concerning resource access in Flanders, the **objectives** are twofold: to guarantee the multifunctional uses of the water cycle for the current and future generations and **to protect the drinking water resources against the pollution and over-abstraction**. Policies about resource access concern the protection of the environment and public health. The conservation of the water cycle is a great concern with a special attention to the renewability and maintenance of **surface and groundwater reserves**. Flanders has already transposed the objective of a good status of hydrological systems as of 2015 in the regional law. The approach tends to be more ecosystemic. At the same time, the absolute priority consists in preserving the regional **capacity of drinking water production**. In particular, extensive measures are developed in favour of the reduction of manure disposal.

Instruments are mainly prescriptive. They consist in regulating abstraction, protecting against less indirect pollutions and allow access to the resource to drinking water operators.



Abstraction is regulated with abstraction permits and protection perimeters. An **authorisation is required for any pumping in groundwater and in navigable rivers**. The permit is necessary for the construction, modification, exploitation, artificial recharge and restarting of exploitation of a groundwater withdrawal. In addition, **sensitive areas and protection perimeters** are created. Vulnerable zones for water (*kwetsbare zones water*) are created where concentrations of nitrates in water already exceed 50mg/l, and action programmes are elaborated to reduce pollution sources. 46.6% of the farming areas are classified as such. Protection zones are delimited around the withdrawals intended for public distribution. Concerning the protection against the pollution, **environmental permits** are necessary to construction works and the conduct of economic activities. The environmental permit scheme consists in a general prohibition affecting discharges associated with the delivery of prior authorisations for the exploitation of industrial activities. Any delivery of a building or exploitation licence is conditioned to the fact that it makes no harmful effect on the natural water cycle. If possible, the effect is limited, repaired or compensated. In case of harmful effect on groundwater, the permits are systematically refused. Licenses and permits can be revised in case of failure in reaching the environmental objectives. Concerning diffuse pollution sources, particularly by intensive catering, Flanders adopted a whole programme of **restrictions in manure disposal**. The treatment of manure is made compulsory above a certain level of production (from 2.6mio kg P₂O₅ in 2001 to 7.0mio kg in 2002) and time periods and quantities for disposal are limited. Transportation of manure is limited with an authorisation system, as well as imports, and the obligation for each producer to dispose of the manure he produces. Concerning access to the resource, drinking water producers have the opportunity to benefit from **expropriations for cause of public interest**. The drinking water producer proceeds to expropriation with the agreement of the regional government.

Incentive instruments are constituted of taxes and subsidies. Taxes are spread on different target groups. They are collected on water abstraction and discharges in rivers. Industrial and domestic discharges are taxed, with a particular emphasis on the reduction of industrial emissions. Also, farmers are penalised for excess in the production of manure. A basic fee applies on each farmer that produces manure in excess, in complement to an annual fee for manure disposal. At the same time, farmers are compensated for losses in revenues due to water protection against nitrates, especially in vulnerable zones. Additional indemnities are



even foreseen if the farmer goes above the objectives contractually set with the Region. At last recourse, farmers can request the expropriation of their parcels by the public authorities.

Informative and self-regulative instruments are used in resource protection policies. Public campaigns are conducted in direction of the citizens about pesticide uses. The public is more generally informed of water management plans in the context of the implementation of the WFD. Farmers receive more specific training about manure disposal, particularly in areas where water is intended for the production of drinking water. In vulnerable areas also, codes of good practice are developed for farmers, as well as bilateral water conventions between farmers and regional authorities that set more stringent objectives for the reduction of manure production and disposal (33,950ha concerned today).

The main target groups of the water resource protection and access policies are the **farmers**, drinking water producers, and industries. The actors of implementation are diverse, with a predominance of the regional administration. Policies are developed according to the following action logic: *If we protect waters against punctual and diffuse pollution and we prevent excessive withdrawals, then we will secure our reserves for drinking water production.* The Government and the ministers of the Environment and the Agriculture take decisions that are implemented by diverse regional administrations or agencies: the Administration of the Environment (AMINAL), the Environmental Agency (VMM) and the Land-Use Agency (VLM), that manages in particular the "Bank of Manure" (*Mestbank*). Drinking water producers, for their part, are directly in charge of water protection inside the protection perimeter.

The question of effects (outputs/outcomes) is less evident to determine. Concerning the regulation of nitrates, even if a complex policy programme is effective since 1991, the legislator never succeeded in prescribing limitations in the production of manure that would concretely mean a stop in the growth of extensive farming. As a result, in some areas rivers remain deeply polluted by nitrates and phosphorous (e.g. West-Flanders). Even if reductions of discharges by industries and households are substantial, the impossibility to tackle the problem of diffuse agricultural pollution hampers these good results. As a consequence of constant pollution of groundwater, Flanders is directing its drinking water production to



surface water and encouraging the use of polluted water for non-drinking water uses, in particular by industry.

Wallonia

Legislation in force

Regional act of 7 October 1985 about the protection of surface water against the pollution

Regional Act of 30 April 1990 about the protection and exploitation of groundwater and potential drinking water

Regional Act of 5 December 1996 about the Walloon *intercommunales* (capacity of expropriation)

Regional Act of 11 March 1999 about the environmental permission

Regional act of 15 April 1999 creating the Public Water Management Company

Regional Act of 7 March 2001 reforming the Walloon Water Company (capacity of expropriation)

The initial objective of public policies concerning resource access is to preserve potential drinking water against the pollution and improve their quality. The policy intends to put in place all the necessary mechanisms to guarantee the security in provision of drinking water. Both groundwater and surface water intended for the production of drinking water are put under the same concept of **potential drinking water**. The same protection regime applies to both kinds of water bodies. The secondary objective consists in **managing potential drinking water “rationally”**. This means an equitable distribution between the needs of drinking water producers, prevention of the pollution and the respect of the property (ownership). The authorisation system both for the withdrawals and competing activities has been simplified. Some of the mechanisms presented here are also used at other stages of the anthropic water cycle following the current logic of global and integrated management of the water cycle.

In the water protection and access policies, instruments are of different nature. *Prescriptive* instruments cover four kinds of public interventions: the abstraction permits, protection perimeters, limitations to activities and expropriations. First, any potential or existing water producer asks for an environmental permission for every wells and spring it exploits. The **environmental permission** authorises the producer to conduct its activities and sets its rights and obligations. It defines the maximal volumes withdrawn and the control procedure. Eventually, notably in case of the exploitation of a fragile aquifer, it sets the minimal level that the aquifer can reach. The authorisation is given by the commune for 20 years renewable. It is revocable in case of abuse or disrespect of the obligations.



Second, **protection perimeters** are delimited around the wells. They are concentric circles drawn around the wells and corresponding of the time needed for water to reach the pond. The first perimeter is the abstraction perimeter. It is an area with a radius of 10 meter around the wells, generally fenced. The producer owns it and no activities are allowed inside. The second perimeter is the prevention perimeter. It corresponds the distance covered by water in 24 hours. Activities are strongly limited inside. The third one is the perimeter of observation. Restrictions are less important there. In the prevention perimeter, activities are possible but restricted. Any **discharge or deposit of polluting substances and oil** are put under **prior permission**. Construction works and digging are regulated. **Farming activities** are also restricted. Manure spreading and pesticide spreading can be limited and, in case of excessive concentration in groundwater, prohibited. The injuries caused by the requirement of the protection perimeter are put at charge of the water producer.

Third, given the public status of all drinking water producers in Wallonia, the Law recognises the character of public interest of their activities. Consequently, they all have the capacity to **expropriate land** in order to realise the goals they pursue. Put into concrete terms, they ask a deliberation to the Government and buy the land (or easements only) above the aquifers and along the pipes they install.

The regulation of resource access uses *incentive* instruments. They are organised around a system of fees and subsidies. Water producers are submitted to an **annual fee on water withdrawals**. They choose between a fixed tax rate corresponding to the volume withdrawn or a contract with the Public Water Management Company (SPGE). In general, all drinking water producers are under contract. The contract (*contrat de service de protection de l'eau potabilisable*) stipulates that SPGE executes the legal and financial obligations of the producer. The water producers pay this service EUR 0.074 /m³ to SPGE. The water producer is also responsible of end-of-pipe wastewater treatment of the water it produces. This measure is generally subject to a second contract with SPGE (*contrat de service d'assainissement public*). Instead of operating the future wastewater treatment of the waters it produces, it entrusts SPGE to supply the service at a price of 0.3966 EUR/m³. Money is recovered to the water supplier that passes it on the water bill of the consumer.



The product of the fees and contracts constitutes the Regional funds for the protection of water. This funds finances the protection of withdrawals, more specifically the related hydrogeological studies and tests, indemnities of expropriation, subsidies for works made by particulars inside the protection perimeter, prevention measures, action programmes in areas vulnerable to nitrates, remedies to accidental pollution, etc. Most of the indemnities that the producer pays for the prejudice faced by former activities inside the protection perimeter are taken at charge of SPGE according to the contracts²⁷⁶.

Finally, some *informative* measures are mentioned in the Law. On the one hand, during the procedure of delivery of a building licence or an environmental permission, the communes inform the persons concerned of the restrictions specific to the protection perimeters. Notices are put at place all around the protection perimeter.

The main target groups of the water protection and access policies are the water producers, residents, farmers and other activities located inside the protection perimeter. The policy is elaborated by the Walloon Government and the Minister of Water and the Environment. Implementation is shared between the administration of the Environment (DGRNE) and the Public Company for water management (SPGE) that manages the collection and distribution of water charges (costs and taxes). The policies follow this action logic: *If we regulate withdrawals and we limit punctual and diffuse pollution sources, then we will guarantee a safe and sufficient potential drinking water over time.*

In the present case, most part of the legislation is new. It is too early to measure any potential effect, as it has just been implemented. Outputs are low then. The number of protection perimeters is slowly increasing: 2 protection perimeters were adopted by a Walloon execution decree end 2001 and 35 end 2003. At the same time, 103 applications from the drinking water producers were submitted to the government, representing 287 water intakes and 141mio m³ (44% of total regional water withdrawals). At the same time, a recent report of the Administration of the Environment (DGRNE) states that groundwater reserves are high and that the potential drinking water from the aquifers is of a good quality. Then the outcomes seem to be high. We wonder however if the good results are imputable to the public policy

²⁷⁶ The funds does not take the purchase of news wells at charge, e.g. in the case of expropriation. This purchase is at charge of the drinking water producer.



conducted. In fact, we conclude in such a situation that the degree of imputation is low and that the policy is not liable of the outcomes.

Region of Brussels-Capital

Legislation in force

National law of 26 March 1971 about the protection of surface water against the pollution

National law of 26 March 1971 about the protection of groundwater against the pollution

National law of 22 December 1986 about the status of the inter-communal associations (capacity of expropriation)

Execution decree of 26 February 1987 about the inventory of withdrawing points

Execution decree of 8 March 1989 about the creation of the Brussels' Institute for Environmental Management

Regional act of 2 May 1991 about pesticides use

Regional act of 22 August 1991 organising land-use and urban planning

Regional act of 5 June 1997 about the environmental permission

Regional act of 29 March 1996 instituting a tax on wastewater discharges

Execution decree of 20 September 2001 establishing the project of Regional Development Plan

Access to the resource and production standards for CIBE are determined by the competent authority on the production place. That is to say that most of the production activities of CIBE are under the regulation of the Walloon Region. There is no drinking water production from surface water in the Region of Brussels-Capital and very few wells that withdraw groundwater (*Bois de la Cambre*).

Nevertheless, the Region of Brussels-Capital is complained to develop a drinking water protection policy by the European Union. This policy is also tied to the protection of the natural resource. This policy consists in developing **knowledge** on the aquifers and groundwater withdrawals, ensuring the protection against **hazards and nuisance** that an activity could cause on the environment, public health and safety, reducing the pollution of surface and groundwater by nitrogen from agricultural sources and avert any new pollution of this kind and limiting **pesticides use** on the public domain. In fact, this protection policy is oriented towards the development of recreation and ecological functions of surface water bodies. The goal is to ensure the quality of surface water and enhance biological diversity, notably in localising pollution sources, re-establishing the continuity of the surface water network (blue network) and concentrating discharges of clear water in this web (reduction of water floods and dilution of the influents to the treatment plants).



The instruments are mainly *prescriptive*. The regulation of industrial discharges is equivalent to the one developed in Wallonia. The conduct of an (industrial) activity necessitates a prior environmental permit. Four classes of activities correspond to the potential nuisance of the activity and the permit is valid for 15 years. Concerning water abstraction, the Region makes an inventory of abstraction points in aquifers. A prior declaration is only required for the construction works around or modification of a drill. About nitrates, one single sensitive area has been delimited around the withdrawing points of CIBE. As *incentives*, industrial discharges are taxed according to the polluting charge. Prevention campaigns are set up to promote alternative means to weed killers (mechanic and thermal weed, differentiated management, biologic weed killers) in order to avoid the spreading of pesticides.

The target groups of the protection policy are the industries, households, and farmers (one farm in the Region of Brussels-Capital), as well as public services operating on the public domain. The action logic is: *If we reduce punctual and diffuse discharges in pollutants and we develop the web of surface water bodies, we will improve the quality of living in the Region.* The policy is implemented by the Government, the Minister of the Environment and the Environment Agency (IBGE) that makes most of the environmental management, and the communes.

The policy has not much effect on the availability of drinking water resources, as drinking water production is non-significant in the Region of Brussels-Capital. The inter-communal water producer CIBE withdraws almost all water in Wallonia. It has only one single abstraction perimeter in the Region of Brussels-Capital. Concerning the resource, there is not much pressure of the resource. The tax on industrial discharges incites industry to invest in their own treatment works (mainly the small steelworks industries).

10.3.2. Drinking water production

10.3.2.1. Flanders

Legislation in force

Regional act of 28 June 1983 establishing the regional water company (capacity of expropriation)

Directive Lenses of 1984

Regional act of 6 July 2001 about the status of the *intercommunales* (capacity of expropriation)

Regional act of 24 May 2002 about water intended for human consumption (quality controls)

Execution decree of 13 December 2002 about the quality and delivery of water intended for human consumption

The objectives of the water production policy in Flanders are oriented towards the protection of public health and the security in drinking water provision. The operator must provide a **water of a high quality**. Water intended for human consumption must be healthy (salubrious) and clean. The Region intends also to ensure a **sustainable water supply**. This consists in the preservation of the production capacity with a special emphasis on the renewability and maintenance of groundwater and surface reserves. In fact, the Region intends to **reduce the dependence from abroad** for drinking water supply (still 25% of total production), i.e. Wallonia and, in a lesser extent, the South of the Netherlands. This research of autonomy notably goes through a reduction of drinking water consumption, by the means of an alternative supply according to the principle of supplying a water **quality fit to uses**. Water quality must be adapted to specific human uses (other than drinking), i.e. drinking water must not be supplied where not necessary. Water for other human uses is supplied with a second water circuit separated from the public network of drinking water supply. Finally, the Region wants to improve the **efficiency of the drinking water sector**, particularly with a rationalisation and comparability of the operators' cost structure and an enhancement of the collaboration between the sectorial actors.

The instruments of the drinking water production policies consist mainly in using quality standards and subsidies. First, in application to the 1998 Drinking Water Directive, **technical standards** are going to be set for drinking water treatment and **quality controls** be reinforced. The policy also introduces the possibility to install and connect to a **second-circuit** of water provided with raw water (with specific standards), intended for other human uses than drinking water consumption. The investments and operation on the drinking water

production infrastructure are subsidised. In complement, the operators are subject to incentives in order to increase the production capacity from raw surface water. **Subsidies to operation** are allocated both to the regional water company (VMW) and to the various inter-communal associations in charge of drinking water production.

The target groups of the production policy are essentially the drinking water producers and the communes. The action logic is: *If we improve our production capacity and adapt production to actual demand, then we will guarantee an autonomous and sustainable water supply*. The Flemish Government, the Administration of the Environment (AMINAL), and the communes implement the production policies. A new actor of implementation should join the scene: a regulatory authority, initially exclusively in charge of the production and supply sub-sectors.

In terms of effects, once again, the researchers face a **lack of data** in order to assess the organisation of the sector and the policy. This deficiency is publicly acknowledged by the Flemish Parliament and the Belgian Audit Office that particularly demand the creation of a database about drinking water supply and demand. Concerning the policy of independence in drinking water production, it produced some effects as dependence was reduced from 60% to 25% since the launch of the policy in 1984. It is too early to tell about the effects of the optimisation of water provision (second-water circuit) on the preservation of groundwater reserves. However, the Region has already financed alternative supplies of textile industries in West-Flanders to fight against the risk of salination of aquifers by coastal water due to previous over-abstraction of these industries.

10.3.2.2. Wallonia

Legislation in force

- Regional Act of 30 April 1990 about the protection and exploitation of groundwater and potential drinking water
- Regional Act of 15 April 1999 creating the Public Water Management Company
- Regional Act of 7 March 2001 reforming the Walloon Water Company
- Regional act of 12 December 2002 about the quality of water intended for human consumption

Concerning water production, the priority objective in Wallonia remains **groundwater production without prior treatment**. It also commits itself to guarantee the quality of the product, fight against the pollution upstream (e.g. discharges of hazardous substances,

limitation on manure spreading), and enhance the production capacity of the Region, both in infrastructure and in terms of efficiency. The Region also sets ambitious structural objectives with the aim to **harmonise water production prices** and set up a **regional water industry**.

As in Flanders, the 1998 Drinking Water Directive requires production standards. As such, Wallonia determined a binding list of substances and processes that are used in prior treatment. Concerning incentives, out of the traditional subsidies to investments and operation, the Region participates to the financing of the development and works on mains (*Tranhennuyère*), as well as research about prior treatment of *mining waters* in order to convert them into drinking water (removal of heavy metals). The structural goal is mainly reached by *self-regulation* with the constitution of groups of economic interest (GEI) between the operators of drinking water production. The purpose is to develop co-ordination of purchases and public works between the inter-communal associations and the other public companies (also extended to other public utility sector, such as gas or electricity). It consists also in the creation of a syndicate of operators that announces the Regional Water Production Company. In fact, the final goal remains the edification of one single regional drinking water company (not necessarily limited to the production of drinking water), on the basis of the current regional water company.

The target groups of the Walloon production policy are necessarily the water producers. Implementation is conducted by the Minister of Water, the Administration of the Environment (DGRNE) and the Public Water Management Company (SPGE), according to the following action logic: *If we protect aquifers and we set up an industrial capacity, then we will guarantee long-term provision of safe drinking water at an affordable price as well as the export capacity of the Region in the drinking water sector.*

10.3.2.3. Region of Brussels-Capital

Legislation in force

- National law of 14 August 1933 about the quality of drinking water
- National law of 26 March 1971 about the protection of surface water and groundwater against the pollution
- National law of 22 December 1986 about the status of the inter-communal associations
- Execution decree of 24 January 2002 about the quality of drinking water

Despite the fact that drinking water production in the Region is residual (one single drill of CIBE), the Region of Brussels-Capital is complained to develop a production policy, because of the requirements of the European Law and domestic production from small wells. The policy is limited to a minimum set of prescriptive measures. The central objective consists in ensuring the provision of a water of high quality and protecting public health. The supply of drinking water without certainty that it is healthy and clean is prohibited. Quality standards for production determine technical standards that limit the processes and additives used in the drinking water treatment. The production activities of CIBE are partially subsidised by the Region, notably through the financing of the operation activities of IBDE, the regional water supplier operated by CIBE.

The drinking water suppliers (even the residual or domestic ones) are the targets groups, according to the following action logic: *If the provider respects stringent quality standards and informs the users of any other risks on human health, then drinking water will not be a threat for human health.* The policy is implemented by the Government, the Minister of the Environment and the regional environmental agency (IBGE).

Most of the drinking water treatment plants of CIBE are located in Wallonia, a situation that limits the effects of the current Brussels production policy. Furthermore, the relationships between the producer and the provider (actually the same company) are not taken into account into the law, even for the destination of subsidies. We imagine that cross-subsidisation between the two entities (CIBE and IBDE) are of common occurrence.

10.3.3. Drinking water supply

10.3.3.1. Flanders

Legislation in force

National law of 22 January 1945 (price control at Federal level) and application decree of 20 April 1993

Regional act of 28 June 1983 establishing the regional water company (capacity of expropriation)

Regional act of 6 July 2001 about the status of the inter-communal associations (capacity of expropriation)

Regional act of 20 December 1996 (free supply)

Execution decree of 29 June 1999 about the installation of rainwater tanks

Regional act of 24 May 2002 about water intended for human consumption (quality controls)

Execution decree of 13 December 2002 about the quality and delivery of water intended for human consumption



Water intended for drinking (for "human consumption" according to the 1998 Directive) must be **healthy (salubrious) and clean**. The priority objective of the Flemish drinking water supply policy goes to the protection of public health. The policy requires the supply of a water beyond reproach (continuity, access and quality) on the whole territory. In particular, it intends to put an end to lead-poisoning (*saturnisme*) and to limit the risks of bacterial infection (*legionella*). Concerning the customer, he must receive the best possible **service**, through the development of contractual relationships between the subscriber and the provider. The service includes social measures. The provider guarantees the continuity of **water supply to poor families**, considered as essential to live in dignity and in respect to the current standards of living. In complement, a federal price control intends to avoid any abuse from the monopoly position of the drinking water supplier and the Region wishes to reduce the individual consumption of drinking water. Concerning the sector, the efficiency of the drinking water sector must be improved, particularly with a **rationalisation and harmonisation of the cost structure of the operators** and the collaboration made acceptable between the different actors of the sector.

Prescriptive instruments respond to the three main objectives, i.e. quality of supply, services to the client and affordability of drinking water to all. First, **new quality standards** were adopted for drinking water and for water in the second circuit. A decrease in the current quality of drinking water is prohibited. Exceptions are tolerated only if it has no impact on human health and on the resource. Derogations to the standards are made possible if no alternative exist and human health is not threatened, but only for a limited period of time (three-year period, max. 9 years). Correction measures and restrictions are required in case of non-conformity to the drinking water standards. In parallel, quality controls are reinforced. In conformity to the European Law, the water distributor is held liable for the **quality of drinking water at the tap** and organises controls. In case of non-respect of the standards, **liability is shared between the distributor and the subscriber**. The liability of the distributor is released if it proves that the individual installation of the subscriber is not conform to the technical standards, and after it has informed the subscriber of the corrective measures to take. The distributor takes the necessary measures in case of a risk of non-conformity. The subscriber (or the owner) must execute the corrective measures. As a

consequence of this, the right of visit in private houses is extended for controls of conformity and inventory of installation of collection and re-use, rainwater tanks, waste-water or water withdrawals.

The guarantee of the best service to the client is ensured by the development of a **contractual relationship** between the water supplier and the subscriber. A regulation of water sales (*règlement de vente d'eau*) is adopted, that sets the modalities of water controls and inventories, the division of responsibilities between the subscriber and the supplier, and the adoption of corrective measures. This relationship is supplemented with a legal definition of the obligations of **public service** for the water supplier. The water supplier must:

- Exploit, maintain and develop the public network of water distribution;
- Develop action and awareness programmes about sustainable uses of water towards subscribers and consumers;
- Take social measures;
- Ensure and guarantee the provision of services to the client;
- Ensure the protection of the environment during withdrawals, treatment and distribution (using the best available techniques);
- Set a right of connection and apply a defined price structure for it;
- Send the general and particular regulation of water purchase to the subscriber;
- Apply the lowest possible operation cost;
- Provide a free quantity of drinking water.

Indemnity to the water suppliers are expected for the implementation of missions of public service that do not belong to their core business.

Prescriptive instruments also respond to the social objectives of drinking water supply. A **minimal provision of water for free** is set. Each subscriber receives 15m³ per person and per year for free on the whole regional territory. The costs of supply are at charge of the water

supplier. In addition, supply cuts are limited by a binding procedure, and the right of connection should be soon confirmed in an execution decree.

Concerning the target of a drinking water consumption decrease, the regional legislator introduced the possibility of a **second-circuit** of water provided with raw water, intended for human uses other than human consumption. The double circuit can be installed in individual houses, but distinct circuits are compulsory and withdrawals on the second circuit for human consumption strictly prohibited. The installation and use of the second-circuit are put under the responsibility of the subscriber and the provider. Another measure is the installation of rainwater tanks. Every new house constructed must have a rainwater tank of a minimal capacity of 3 m³, with a pump. The building license is not delivered if the tank is not foreseen.

Incentives are well-developed in the distribution policy. The Region allocates **subsidies for investments and operation of the drinking water supply infrastructure**. They are allocated to the water suppliers (VMW, inter-communal associations and communal services) that meet the policy objectives. The Region particularly encourages an increase in interconnectivity of water mains. For their part, the drinking water customers are encouraged to install a second circuit and rainwater tanks.

A mechanism of **price control** remains operational on water supply at the Federal level. The Federal Minister of Economic Affairs (Commission of Prices) gives his prior consent to any price increase. This procedure is justified by the situation of natural monopoly, completed by the fact that such price increases have an effect on inflation.

Both customers and operators are targeted by *informative* instruments. **Information campaigns in favour of the limitation of consumption** are organised by the Regional administrations and agencies and by the water distributors themselves. In complement, the **regulations** of water purchase and the derogations to the parametric values must be communicated to the customers. An **alert system** signals excesses of parametric values and provides information about the safeguard measures. The operators are going to be submitted to **cost comparison**, a procedure that makes the costs of the actors of the sector more comparable.



The core target group is the water supplier. This notion is more encompassing than the water distributor. It includes both the operator of a public distribution network and the holder of the abstraction permit. The communes, the customers and the industries are also targeted with the water supply policy. The action logic is: *If we establish contractual relationships, we define missions of public service and we encourage the development of a second circuit, then we will obtain the best possible service to the client, a service adapted to his uses.* The actors of implementation are diverse. The Flemish Government adopts the implementation decrees, sets the modalities of application and extends the missions of public service, after consultation of the regulatory authority. The Flemish Minister of the Environment, with the Administration of the Environment (AMINAL), prepares and implements the reform of the quality standards, after consultation of the Hygiene Inspection. The **water supplier** controls the quality of drinking water at the tap. It plays a role in the protection of the environment, in particular in making the inventory of its environmental costs. A local commission of water considers any demand of supply cuts or reclamations for unilateral cuts. The scheme should be soon completed with a regulatory authority that has the duty to reach and accompany improvements in performance, a better service and more transparency (*Drinkwaterdecreet*). Its missions are to inventory, evaluate, advise, report, and submit proposals to the Government about: harmonisation, transparency, separation of tasks (transparency in accounting between the different activities of the sector) and regulation. Its competence concerns water production and supply, missions of public service, investment plans, accounting standards, and benchmarking (competition by comparison).

In terms of effects, we can say that the supply of the 15m³ for free is costly to the water distributors, a cost reflected in the rising price of water²⁷⁷. Furthermore, it does not benefit to the poorest customer and even tends to increase their drinking water bill (Van Humbeeck 1998 and 2000). Many measures are quite new. However, the quality standards of drinking water are well respected, and the installation of rainwater tanks are widespread in Flanders.

²⁷⁷ Source: Rekenhof (1999), "Drinkwatervoorziening in Vlaanderen: sterke-zwakte analyse", *Boek van het Rekenhof 1999. 11e boek met opmerkingen en informatie voorgelegd aan het Vlaams Parlement*, Stuk 36 (1999-2000) - Nr. 1, pp.430-448 and Vlaams Parlement (2001), *Voorstel van resolutie betreffende de drinkwatervoorziening in Vlaanderen*, 669 (2000-2001) n°3, 6 juni.



10.3.3.2. Wallonia

Legislation in force

National law of 22 January 1945 (price control at Federal level) and application decree of 20 April 1993

Regional act of 30 April 1990 about the protection and exploitation of groundwater and potential drinking water

Regional act of 5 December 1996 about the Walloon *intercommunales* (capacity of expropriation)

Regional act of 15 April 1999 creating the Public Water Management Company (SPGE)

Regional act of 7 March 2001 reforming the Walloon Water Company (SWDE) (capacity of expropriation)

Regional act of 12 December 2002 about the quality of water intended for human consumption

Regional act of 20 February 2003 about the creation of a social funds over water

Proposal for price determination (gradual pricing)

Walloon Government's agreement of 1999

Region's roadmap (Contrat d'Avenir pour la Wallonie)

Strategic guidelines for the Walloon Minister of Water about water management in 2015

Providing drinking water of a good quality (healthiness and cleanliness), with a prior objective on public health, guide the drinking water supply policy in Wallonia. The Region intends to combine a rational use of water and sustainable modes of consumption with the provision of the best possible service to the customer in the respect of the missions of public service: continuity, quality and (price) affordability. It guarantees access to tap water to all. Costs inside the WSS sector must be rationalised, with the aim in reaching one single retail price for drinking water throughout Wallonia.

As well as in Flanders, prescriptive instruments insist on the norms of quality, controlled at the tap, e.g. in the kitchen (and not at the water meter anymore, i.e. at the frontier between the public network and the private installation). The drinking water supplier monitors the quality. It is even entitled to control water at the tap in private houses and the private water installation. The liability for the non-conformity to water standards is shared between the distributor and the user (not the final user, but the subscriber). In case of non-compliance to the standards, the liability of the distributor ends when it proves that the non-compliance is due to the non-conformity of the private installation. The administration supervises and assists the control activities. In complement to that, the imperative of public health preservation appears as a translation of the precautionary principle. If there is an identified threat for human health, corrective measures must be taken, whatever the respect of the standards. Thus the liability of the operator lies above the strict respect of the legally-binding standards. The missions of public service should be applied to all operators, but they are only detailed in the



contractual agreement concluded between the regional company (SWDE) and the Region. Unilateral cuts are prohibited (even if the bill has not been paid). Price determination remains a competence of the local council, with prior consent of the Federal Minister of Economic Affairs for price increases. Price control is still in place for basic goods in Belgium.

A social fund for water, fed with a contribution of all water consumers, is used to help people in financial difficulties to pay their water bill. At the second call for payment, the distributor proposes a financial support to the consumer and sends the information to the public assistance that takes the problem at charge. The fund is managed by the Regional Water Management Company (SPGE). The level of intervention is determined by the Government with the advice of the SPGE.

Information duties are put at charge of the drinking water supplier. If the administration considers that a persistent non-compliance to quality standards threatens health, the distributor informs the consumer. In case of urgency, information about health hazards is provided to the consumer in real time, completed with advises and recommendations about the behaviour and the necessary measures to be taken to preserve one's health. An annual report (e.g. with the bill) is sent to the consumer about the quality of the water he consumes, and completed with a note from the administration confirming the good quality of water. In most situations, the water distributor cannot determine price itself. Apply full-cost pricing as a means to aware people about the scarcity of the resource and the technology mobilised in order to provide the service is then still difficult.

The main target groups are the water distributors, the subscribers to the water service, the consumers registered at the public assistance, and the commune (price determination). The action logic is the following: *If we set stringent quality standards and social measures and at the same time we rationalise the sector, then we will implement the right to water and guarantee an equal access to water at an affordable price.* Implementation is assured mainly by the Walloon Government and SPGE. The drinking water supplier provides information, DGRNE conducts the additional control campaigns and the public assistance (CPAS) substitutes to the Poor for the payment of water bills.

Concerning the effects, it is too early to assess the legislative measures concerning the Social Fund, the prohibition of unilateral cuts and the missions of public service. Even the new



standards on drinking water are not effective. However, according to the standards of the 1980 Directive on drinking water, the quality of water supplied in Wallonia is good. 97% of the population has a satisfactory level of bacteriological quality ($TcBacto > 90\%$), and 90% an excellent level. As such, the drinking water standards are respected.

10.3.3.3. Region of Brussels-Capital

Legislation in force

National law of 14 August 1933 about the quality of drinking water

National law of 22 January 1945 (price control at Federal level) and application decree of 20 April 1993

National law of 22 December 1986 about the status of the inter-communal associations

Regional Act of 8 September 1994 regulating drinking water supply

Execution Decree of 24 January 2002 about the quality of drinking water

In the Region of Brussels-Capital, the **objectives** of the drinking water policy consist in guaranteeing a drinking water supply of a high quality and access to all. First, human health must be protected from the harmful effects of a contamination of drinking water with a guarantee that water is healthy (salubrious) and clean. Tackling lead-poisoning is one of the priorities. Second, all the persons established in a building connected to the network have a right to the drinking water supply for their domestic use.

Prescriptive instruments focus on the quality of drinking water. It is prohibited to provide drinking water when it is not healthy and clean, according to pre-defined standards. Restriction or prohibition of supply is required in the presence of a potential risk on human health, even if all the parametric values are respected. The **conformity of water standards is measured at the tap**. The water supplier (or provider or distributor) is held liable of water quality until the water meter, that constitutes the border between the public distribution network and the private installation. If water is not conform at the tap, the liability of the provider to supply clean water stops at the water meter, given the fact it has advised the subscriber about the necessary corrective measures to take on the private installation. If case of unfruitful cooperation, the water provider cuts the supply, with consent of the administration. In case of water supplied in a public place (schools, hospital, hospices, restaurants, etc.), the liability of the water provider is extended to the duty to inform the administration and to check if the subscriber effectively informs the public. He can also



modify the drinking water treatment in order to reduce or eliminate the risk (e.g. lead-poisoning due to the acidity of water that eats into pipes in lead). Temporary derogations to the quality standards are tolerated within the respect of a stringent procedure. The water supplier has a right of inspection of the private installation. More generally, it has the duty to ensure water quality controls on a regular basis. It sets up programmes of controls. Additional controls on micro-organisms and substances are required, even if no parametric values are determined for them in the standards. In case of non-respect of the standards, the water provider makes an enquiry immediately and takes the corrective measures as soon as possible. It decides of the measures to be taken and informs the administration.

Prescriptive instruments also concern social measures. First, the service to the consumer must be guaranteed. Imperative rules organise the relationship between the contracting parties to water supply, with regulations on general and particular conditions. The supplier has the obligation to satisfy to any demand of subscription from the owner or the subscriber. The subscriber (owner of the building) remains tied to the payment of the bill if the user does not pay. When the supply is intended for domestic consumption, it cannot cut water supply. Any water cut requires the prior consent of the mayor or president of the public assistance and a prior notification to the subscriber.

Concerning *incentives*, an annual regional subsidy to the regional water distributor (IBDE) is allocated to the improvement, transformation and extension of the drinking water network and to the retribution of IBDE.

Some *informative* instruments were adopted. Every consumer can ask any relevant information about the quality of drinking water inside his district. The supplier must provide sufficient information to the consumer about the corrective measures they must take in order to make water conform to the standards at the tap. The population must be informed in real time in case of derogation to the standards or potential threats. As a *self-regulative* instrument, IBDE is encouraged by the regional government to structure the water tariffs and to adopt a social tariff for water (no law-making on this topic).

The main target groups are the regional drinking water supplier (IBDE-CIBE), the subscribers to the service (owner of the building) and the drinking water users. The Government, the Minister of the Environment, and IBGE implement the policy. IBDE-CIBE and certified

laboratories have the duty to control the respect of the quality standards. The communes and communal public assistance services are also actors of implementation. The action logic is: *If we determine more stringent standards and we prohibit unilateral cuts, then we will guarantee a drinking water supply of a high quality and an access to all.*

10.3.4. Sewerage

10.3.4.1. Flanders

Legislation in force

National law of 26 March 1971 about the protection of water against pollution (subsidies)
 Regional act of 28 June 1985 about environmental permission. Respect of the Vlarem 2 norms
 Regional act of 12 December 1990 about the administrative reform
 Ministerial notice of 19 December 1996 introducing the code of good practice for the construction of sewers and individual connections
 Execution decree of 23 March 1999 about the conditions of subsidisation of non-prior communal sewers
 Execution decree of 29 June 1999 about the installation of rainwater tanks
 Regional act of 21 December 2001
 Execution decree of 1 February 2002 about the subsidisation of communal sewers and small wastewater treatment plants

The objective for sewerage is tied to those of wastewater treatment. It consists in **treating all domestic wastewater**. 100% of houses must be connected to a treatment plant. A performance objective was recently added that consists in **fighting against the dilution of influents** in the supra-communal treatment plants (RWZIs – *rioolwaterzuiveringsinstallaties*).

The instruments are mainly *incentive*. Since 1996 the communes receive **subsidies** specifically intended for the communal sewerage. They receive 50% of the construction costs for the development and renovation of non-prior communal sewers. However, in order to fulfil the objective of yield improvements, the allocation of subsidies is conditioned to the respect of the principle of separation between domestic wastewater and rainwater (necessary condition for the increase of the polluting charge of influents in the RWZIs). The conception of the sewerage network must respect the method advocated in the code of good practice. The communes must conduct this policy on the whole communal territory, and in addition install rainwater tanks in communal buildings. They must also adopt communal regulations about the subsidisation of the installation of rainwater tanks and about the separation of waters in new private houses. With respect to the more stringent dispositions of the code of good



practice, the subsidies rise to 75% of the construction costs (evacuation of rainwater through an ecologically enhanced ditch), and even reach 100% if the sewer has a limited diameter (2 DWA) and rainwater is evacuated in an open-sky and ecologically enhanced ditch. The separation of rainwater is also encouraged through the regional subsidies given for the construction of communal wastewater treatment plants (KWZIs - *kleinschalige waterzuiveringsinstallaties*). The initial 50% foreseen also rise to 100% if the sewers connected to the KWZI are separated ones. Prior sewage is subsidised at 100% and realised by Aquafin as a part of the treatment policy. This concerns mainly the main sewers that connect the communal networks to the supra-communal treatment plants. In complement, prescriptive instruments were added, with the obligation to install a rainwater tank in new houses, as well as to separate wastewater and rainwater in new private houses and to connect to the public sewers. The **code of good practice** that synthesises the best practises for the construction of sewers is also an informative instrument. Being developed by a professor of civil engineering (*Katholieke Universiteit Leuven*), it sums up the techniques available to separate rainwater from wastewater.

The target groups of the sewerage policy are the citizens and the communes. About implementation, the commune formulates intentions to conduct works on the sewers. VMM makes the planning on a yearly basis and the Minister of the Environment adopts the subsidisation programme. Sewerage is a communal competence. The Provinces play also a role in implementation as they supervise the construction works conducted by the communes. We also mention the possibility given to the communes to realise **cross-border leases** on the sewers. This financial engineering is the result of a fiscal benefit given to US companies that invest money abroad²⁷⁸. The companies reduce the level of gross profit (taxable) with investments that they amortize/write off during many years. The communes that sale their network benefit from a cash receipt. One-third of the Flemish municipalities already decided to lease their sewage networks. The Flemish Region authorised the communes to proceed to cross-border leases, officially in the name of communal autonomy. The action logic is the following: *If we collect all domestic waste waters and we separate them of rainwater, then we*

²⁷⁸ FETijd, 29-31.03.2003.



will improve the yield of our treatment plants and get a more efficient treatment of wastewater.

In terms of effects, we observe an under-investment in the sewer networks. There are strong delays in the realisation of the sewerage infrastructure and the amount of subsidies available is insufficient. Over the period 1996-2001, only 67% of the communal demands were considered each year. Thus the demand for subsidies is much more than the supply. Despite of regional subsidies, high residual costs are charged to the communal budget²⁷⁹. Many communes delay their construction projects for this reason, as they lack own financial resources. The cost of studies and digging are the most important ones and they are not covered by the subsidies. In average, the subsidies cover only one third of the total cost borne by the communes. In complement, coordination is poor between the location and construction of treatment plants and the local development of the sewerage networks. New treatment plants (subsidised at 100%) do not necessarily have enough wastewater to treat in order to operate properly, as the sewer networks has not been completed.

10.3.4.2. Wallonia

Legislation in force

Regional act of 7 October 1985 about the protection of surface water against the pollution

Regional act of 1st December 1988 about the regional subsidies for particular investment of public interest

Regional act of 30 April 1990 about the protection and exploitation of groundwater and potential drinking water

Regional act of 11 March 1999 about the environmental permission

Regional act of 15 April 1999 creating the Public Water Management Company

Execution decree of 22 November 2001 defining prior sewerage and settling its financing

Execution decree of 13 June 2002 determining the programme of investment in sewage and protection of wells over the period 2000-2004

Execution decree of 22 May 2003 about the regulation of treatment of urban wastewater

²⁷⁹ “Zuiver gemeentelijk krijg je dat niet verkocht aan uw inwoners en is dat niet betaalbaar. We moeten ons geen illusies maken. Je mag zoveel subsidiëeringsprogramma's geven als je wilt, met 75% lopen de kosten voor onze projecten nog steeds ongelooflijk op. We hebben nu twee projecten, waarvan de kostprijs een vijfde van onze jaarinkomsten is”. “De kosten voor een project zijn 85 miljoen, waarvan 31 miljoen rioleringkosten. Op die rioleringkosten krijgen we 75% subsidies. Dat wil zeggen dat zo'n 23 miljoen betaald wordt door het Vlaamse Gewest. Maar dat wil vooral zeggen dat wij nog 62 miljoen van de kosten moeten dragen. Dus slechts 1/3 van alle kosten worden gesubsidieerd. En dat is nog niet alles. Op alle werken - die beschouwd worden als nieuwbouw - moet er sowieso 21% BTW betaald worden. Dus van die 75% subsidies, gaat nog eens 1/6 terug naar het Vlaamse Gewest. Wie subsidieert Wie eigenlijk?”, cited in Van Zele and Leroy (2003: 31).



The objective for sewerage in Wallonia consists in preserving the quality of surface and groundwater. In respect to the principle of integrated water management, the Region organises wastewater sewerage and treatment at the scale of tributary river basins. It also attempt to avoid problems of dilution in the sewers (that has an impact on the yields of the treatment plants).

As prescriptive instruments, the Region sets (1) a planning and determination of a set of priorities. Above 10,000 p.e. urban areas must immediately be equipped with sewers and main sewers, and between 2,000 and 10,000 as of 2006. In less populated areas, the installation of an individual treatment work is compulsory as of 2010. Priority areas are also planned for sewerage, closely tied to the planning of the construction of treatment plants. The regime under which the urban area is submitted is established in a plan at tributary basin scale, the PASH (*Plan d'assainissement par sous-bassin hydrographique*). The consultation of the PASHs is possible in the concerned communes, at the SPGE or on the Internet. (2) Discharges are restricted. A general prohibition of discharging pollutants in surface water and public sewers without a prior permission is under application. The delivery of environmental permits for discharges complies with the sector-based standards for industrial discharges in public sewers. (3) The sewerage network must respect quality prescriptions. The separation of wastewater and rainwater is required. Separate evacuation of rainwater in a ditch, a losing wells (*puits perdant* or *drain dispersant*) or directly in surface water is warmly encouraged, and even separative system are compulsory in new houses. Leakages and infiltrations of clear water on new or renewed sewers are prohibited. The communes have the obligation to realise a diagnostic study of its sewing network.

As incentives, the communes are granted of subsidies for the construction and refection of sewer (65-85%), if the works are included in a specific planning (PASH, or former PCGE – *Plan communal general d'Egouttage*). The product of the collection of a fee on both domestic (through the water bill) and industrial water discharges is put on the Funds for the protection of water quality. Self-regulative instruments are developed in the sewerage policy. The contract of urban areas (*contrat d'agglomération*) is a convention between the communes, the inter-communal associations, the Region and SPGE. It defines priorities for studies and construction works concerning the sewers, the main sewers and the treatment plants.



The target groups are the communes, the owners of new houses (separation), households, industries and SMEs. The action logic is the following: *If we integrate all investments in sewerage and treatment in a single planning at tributary basin scale and we concentrate on the more densely populated areas, then we will reach a better water protection and respect our international commitments without much delays.* The communes (formally competent on sewerage), the Government, the Minister of Water, SPGE, the regional administrations (DGRNE, DATLP, GPL), as well as the inter-communal associations of treatment and the water suppliers (collection of the fee) are the main actors of implementation. The preparation of the PASH is put under the responsibility of SPGE that delegates the realisation to the inter-communal associations of treatment. Each PASH is formally adopted by the Government. The PASH have been developed with the aim to amend the former communal plans for sewerage in line with the requirement of the 1998 Directive on urban wastewater and the WFD. The current 262 communal sewerage plans (PCGEs) did not make the distinction between prior and non-prior collective treatment and between areas above and under 2,000 p.e.. All the PCGEs will be progressively replaced by 14 PASHs designed at tributary river basin scale. For the moment, the two first PASHs (Vesdre and Dyle-Ghète) are under adoption. In order to fulfil the programme of construction of prior sewers, the SPGE invests EUR 25mio per year to subsidy communal works in urban areas (above 2,000 p.e.).

10.3.4.3. Region of Brussels-Capital

Legislation in force

National law of 26 March 1971 about the protection of surface water and groundwater against the pollution

National law of 22 December 1986 about the status of the inter-communal associations

Regional act of 16 July 1998 about the granting of subsidies for the realisation of investments of public interest

Regional act of 16 December 1999 about the general budget for spending

Regional act of 28 June 2001 about the Funds for the financing of water policy

Execution decree of 5 July 2001 about the allocation of subsidies for sewerage plans

The objective is to encourage communal investments in sewers, with the aim to coordinate and integrate communal and inter-communal sewerage networks. As in the other regions, the sewerage policy in Brussels must ensure a rational functioning of the treatment plants (through less dilution of wastewater in the main sewers) and avoid water floods in vulnerable

districts. This consists in separating waste- and rainwater as much as possible, e.g. in diverting flows towards the rivers and ponds through the surface water web.

As a *prescription*, the communes elaborate a communal plan of sewerage, in fact a mapping of all the sewerage infrastructure in the commune. Instruments are mainly *incentive* ones. Subsidies are distributed for the study, construction and renovation of the networks of sewers (30% in general, and up to 60 or 90% according to specific conditions). The financing of the elaboration of the communal plan of sewerage is also made through subsidies. Additional funds, i.e. an annual regional subsidy and extra subsidies from the Funds for the Financing of Water Policy, are allocated to the inter-communal associations of sewerage (of which IBrA) for the implementation of the communal sewerage plans.

The sewerage policy was also *self-regulative*, when the Region organised discussions in order to merge the former four inter-communal associations for sewerage and eventually attribute the management of communal networks to IBDE or CIBE. Finally, the discussion led to the creation of a new inter-communal association for sewerage (IBRA) put under the authority of the communes.

The target groups are the communes, and IBrA. The policy is implemented by the Government, the Minister of Public Works and the Minister of the Environment, as well as the Regional service of communal investment and the Water Direction of the Administration of Equipment and Mobility (AED). The action logic followed is: *If we integrate and improve the networks of communal sewers and we decrease the dilution of wastewater with rainwater, then we will improve the functioning of the treatment plants and avoid water floods.* The sewerage network in the Region of Brussels-Capital is already well developed as a heritage and a continuous policy of infrastructure renewals. Nowadays, the reorganisation of the sewer network is under way, with major investments in the preparation of the connection to the treatment plant of North-Brussels, e.g. the installation of a system of storm reservoirs (e.g. on Flagey Square).



10.3.5. Treatment

10.3.5.1. Flanders

Legislation in force

National law of 26 March 1971 about the protection of water against the pollution

Regional act of 28 June 1985 about environmental permission (+ Vlarem 2)

Execution decree of 14 February 1990 about complementary rules of taxation for the protection of surface water against the pollution (execution of the 1971 law)

Regional act of 12 December 1990 about the administrative reform (VMM, Aquafin)

Regional act of 21 December 2001 reforming the law of 26 March 1971 (communal treatment plants)

Execution decree of 1st February 2002 about the subsidisation of sanitation works by the communes

Ministerial notice of 4 July 2003 about the connection of industries to the main wastewater treatment plants

The goal of the current Flemish wastewater treatment policy is to improve the quality of surface water while diminishing the effluents of pollutants in the rivers. Subsidiarily the objective of (tertiary) treatment is to fight against eutrophication, but far and foremost, the policy is designed to comply as soon as possible with the 91/271 Directive on urban waste water treatment, in order to limit the condemnations and penalties from the EU for the delays in implementation. The ultimate objective is to connect 100% of houses to a treatment works, preferably a collective treatment facility. At the same time, the Region must improve the yields of the treatment plants.

Two kinds of *prescriptive instruments* are in place, i.e. environmental permits and specific standards for emissions of treatment plants First, industrial discharges, as any other activity causing nuisances to human health or the environment, are submitted to a general prohibition, associated to prior authorisations and sector-based regulations. Effluent discharges of the wastewater treatment plants also need a prior permit and the respect of standards for discharges in surface water (specified in Vlarem 2: 10 mg/l of nitrates and 6 mg/l of ammonium). These particular standards were recently increased and completed with performance requirements (difference between the concentration of water inputs and concentration of outputs) (Vlarem 2). A special attention is given to Aquafin as a target group with the objective to improve the yield of the collective treatment plants. With the same aim, a clear division of responsibilities for treatment was introduced between the communes and

the Region. As of 2002, the communes get a right of initiative to build and operate small-scale collective treatment plant (**KWZIs**) until 2,000 p.e.

Wastewater treatment is highly subsidised. Public money comes mainly from the taxation of industrial and domestic wastewater discharges (the collection of the resources fit to the financing needs of the policy). The Region invests EUR 150mio per year for the supra-communal wastewater treatment, in respect to a convention signed between Aquafin and the Flemish Government. However, subsidies diversified in the two last years in order to improve the yields of the collective treatment plants, and to find alternatives to a large-scale wastewater collection and treatment that gave poor results in rural areas. Financial incentives are consented to Aquafin in order to improve its effectiveness (*efficacité*), under the form of rewards or penalties given the respect or not of the new Vlarem 2 standards (gap between influent and effluent). If the gap is above the standards, Aquafin receives a reward from the Region. In contrast they are penalised if they do not reach the standards. In addition, new measures to subsidise operation costs of KWZIs were adopted. Initially the Region gave a subsidy to the communes only for construction costs and the communes should run the small treatment plants on their own budget, a problematic situation that discouraged any investment in KWZIs. The Region also increased its participation in the construction costs of the KWZIs. Since 2002, the communes receive a subsidy of 50% for the construction of treatment plants under 2,000 p.e. The grant is conditioned by the separation of rainwater from wastewater. In less populated areas, the installation of an individual treatment works is also subsidised where there is no sewer. Existing houses have the obligation to use a septic tank and maintain it in a good shape, with the obligation to proceed to an annual inspection of the tank and to deposit sludge to a treatment plant. New houses are equipped with more complex works that fit with a code of good practice. The citizens receive a communal subsidy of maximum 50% of the cost and EUR 500 and an equivalent regional subsidy of max. EUR 500 for the installation of the individual treatment works.

As a *self-regulative* instrument, the Region allows the connection of industries to the collective treatment plants (RWZIs). Aquafin negotiates and concludes the connection directly with the interested industries, as any other commercial activity (direct contracting with industries). Industrial discharges in the main sewers aim at increasing the polluting charge of the influent.



In 1990, Flanders reformed its administrative arrangement concerning the implementation of the treatment policy. The former regional and public treatment company was split into one environmental agency (VMM) and one mix company (Aquafin). Aquafin is a partnership between the Region and an international water company (Severn Trent). It has the duty to build all the treatment plants and main sewers necessary to fit with the requirements of the 1991 directive on urban wastewater. It realises the investment plan adopted by the Government on the whole regional territory, and operates the infrastructure. The target groups of the policy are in first instance Aquafin (an actor of implementation that becomes a target group ten years later), and then the communes (under 2.000 p.e.), the industries and the households. The policy is implemented by the Flemish Government, the regional administration (AMINAL), VMM, the communes, the provinces and Aquafin itself, according to the following action logic: *If we delegate the construction and operation of wastewater treatment to a mix company, then we will get the know-how necessary to maximise our investment and to respect the EU obligations.*

The effects of the Flemish treatment policy are controversial. Investment in treatment infrastructure has been massive, but conducted to mitigated results. Initially, the Flemish Region has committed itself to invest EUR 1.5bio over ten years and yearly EUR 25mio more for renovation. It pays the services to Aquafin on a yearly basis, with the MiNa-Funds, i.e. an environmental funds fed with the fees on water discharges, but also on waste and other environmental taxes. The taxation of discharges is the first source of income. In 1999, EUR 243mio (BEF 9.8bio) are collected with the taxation on discharges, 39% from the big users (industries) and 61% from small users (SMEs and housings) (EUR 156mio or BEF 6.3bio in 1999). The share of small users should constantly increase, as industry is equipped with individual treatment works and thus reduces its polluting charge.

In a ten-year period²⁸⁰, 1,065 construction projects were delivered for a total price of EUR 1.09bio. At the end of 2000, Aquafin was managing 176 RWZIs (70 new constructions) (190 in 2001), 642 pumping stations (416 new constructions) and 3,339 km of main sewers (2,215 km new constructions). Again, 200 installations must be constructed, of which 60 RWZIs and 140 KWZIs (less than 2.000 p.e.). There are still EUR 4.42bio value projects pending, i.e.

²⁸⁰ From the creation of Aquafin in 1990 to end 2000.

under development or study. Since 1994, Aquafin was entrusted with the exploitation of the whole existing infrastructure. Wastewater of c.a. 3,000,000 p.e. are treated (144,000 more in 2000). Concerning more specifically the municipal KWZIs, their share in the total treatment capacity is negligible and the communes generally prefer to connect their sewers to the infrastructure managed by Aquafin, i.e. to the main sewers that bring wastewater to the RWZIs.

The rate of connection (theoretical) to a treatment plant went from 30% in 1990 to **56.6% in 2001**. Still 28.8% are connected to a sewer that directly discharges in surface water and 14.6% are not connected at all. This policy requires huge financial needs to be implemented. The investments of Aquafin are covered, but the problem lies with the financing of the communal level (sewers and KWZIs) (EUR 65mio per year from the Region). Costs of study and exploitation are too expensive and knowledge and expertise too limited at the communal level (Van Zele and Leroy 2003: 33).

The effectiveness of the treatment policy is mitigated (*efficacité*). The biological influent into the RWZIs remained constant, while the number of RWZIs doubled as well as the volume of influents (Van Zele and Leroy 2003: 4-7; VMM 2002). The average yield of the treatment plants is very low. After ten years of intervention (1990-2001), the percentage of highly-polluted surface water bodies decreased from 19% to 0.6%, polluted water bodies from 38% to 32%, fairly polluted water bodies increased from 28% to 56%, less polluted water bodies decreased from 13% to 10% and clean water bodies are constant at 3% (Prati-index, saturation in oxygen) (Van Zele and Leroy 2003: 4-7). Even if one initial objective, i.e. the respect of the 91/271 directive is going to be fulfilled, the actual problem of the poor quality of rivers in Flanders is far from being tackled.

10.3.5.2. Wallonia

Legislation in force

- Regional act of 7 October 1985 about the protection of surface water against the pollution
- Regional act of 30 April 1990 instituting a fee on industrial and domestic discharges
- Regional act of 5 December 1996 about the Walloon *intercommunales*
- Regional act of 11 March 1999 about the environmental permission
- Execution decree of 25 February 1999 about the treatment of urban waste water
- Regional act of 15 April 1999 creating the Public Water Management Company
- Execution decree of 19 July 2001 instituting a subsidy on the installation of individual treatment systems



Execution decree of 13 June 2002 determining the programme of investment in sewage and protection of wells over the period 2000-2004

Execution decree of 7 November 2002 establishing the exploitation rules of individual treatment systems

Execution decree of 22 May 2003 about the regulation of treatment of urban wastewater

The ultimate objective here consists in preserving the quality of surface and groundwater. In the context of integrated water management, the Region has the aim to rationalise wastewater treatment at the scale of tributary river basins. As in the two other Regions, it is anxious not to reach the commitments made at the EU level before being condemned by the Court of Justice, given the delays in the implementation of the 1991 urban wastewater treatment directive. In concrete terms, it means that the Walloon Region must reach the treatment of 3,815,205 p.e. as of 2005 (against 1,588,325 p.e. in 2000). This figure corresponds to 90% of the public sewage network to put in place, more than the double of the current regional treatment capacity.

The whole Region is classified as sensitive area. As a consequence domestic wastewater is subject to a tertiary treatment in all urban areas above 2,000 p.e. Planning is realised at river basin scale, with an integration of sewerage and treatment. Two regimes are applicable: the collective sanitation regime in urban area above 2,000 p.e. and the autonomous sanitation regime under 2,000 p.e. The first one implies the connection of buildings and houses to a treatment plant, while under the second the installation of individual treatment works (as of 2010) is required. Compulsory secondary and tertiary treatments already required in urban areas above 10,000 p.e. and as of 2006 in areas between 2,000 and 10,000 p.e. Priority is given to urban areas above 2,000 p.e. (253 areas), supplemented by a top priority given to urban areas above 10,000 in the investment planning 2000-2004.

The operation of a collective treatment plant is submitted to a prior environmental permit (single permit). The permit sets the quality standards of water discharges as well as the modalities of evacuation and treatment of sewage sludge. When the quality of the receiving water body is decreasing, the Government can take complementary measures, e.g. strengthen the standards for discharge. Compulsory minimal yields are set for the collective treatment plants (condition of execution of the management contract between the Government and the SPGE).



Individual treatment is also subject to prescriptive instruments. A mechanism of agreement of the systems and installers has been developed (evaluation procedure assessing the technical value, conditions of exploitation and information). The installation is submitted to an environmental declaration (under 100 p.e.). It must respect landscape and the air (bad smells for the surroundings), as well as the separation of rainwater prior to the treatment. Emission standards and regular control of emissions are also existent for individual treatment works.

Concerning *incentives*, the collective treatment is highly subsidised. An annual fee is paid by the domestic water users and the industrials that discharge wastewater directly in public sewers or surface water. The fee, put on the Fund for Water Protection, finances collective treatment. The conception, building and operation of the collective treatment plants are financed at 100% by public funds. People opting for individual treatment benefit from a pay-back of the tax or fee on wastewater discharges. The installation of an individual treatment system is subsidised up to 80% of the cost.

Some *information* also exist, such as the annual publication of the yields of the collective treatment plants or the appending of a notice on the individual treatment work with the characteristics and agreement number.

The target groups of the policy are the inter-communal associations of treatment, the households and the communes (communes can substitute to individuals in order to install treatment systems). The policy is implemented by the Government, the Minister of Water, SPGE (that manages the PASH, the funds and the service contract with the inter-communal association of treatment), the administration (DGRNE), the inter-communal association of treatment (prepares the PASH under the supervision of SPGE, executes the construction works and operates the treatment plants and main sewers) and the water suppliers (tax collection to the domestic consumers). The action logic is: *If we invest massively in collective (tertiary) treatment and we require individual treatment in isolated areas, then we will improve the rate of connection to a treatment plant and preserve the quality of surface and groundwater.* Wallonia planned an investment of EUR 1bio over the period 2000-2004 for prior sewerage and wastewater treatment. The regional (collective) treatment capacity rose by 30% between 2000 and 2003. The theoretical treatment capacity was 2.2mio p.e. in 2002



(against 1.2mio in 1990 and 1.8mio in 2000), at mid-way of the objective of 4.2mio in 2005. Another 1.2mio p.e. are under construction or financially programmed.

10.3.5.3. Region of Brussels-Capital

Legislation in force

National law of 26 March 1971 about the protection of surface water against the pollution

Royal execution decree of 8 March 1989 about the status of the IBGE

Execution decree of 23 March 1994 about urban wastewater treatment

Regional act of 29 March 1996 enacting a tax on wastewater discharges

Regional act of 5 June 1997 about the environmental permits

Regional act of 28 June 2001 about the Funds financing water policy

The objective is to treat all wastewater of the river basin and finance the sanitation policy.

Prescriptive instruments consist in equipping the whole regional territory with a collection system and treating all the influents as soon as possible. The whole region is designated as a sensitive area. Standards of discharges for the effluents of the treatment plants are also set (total phosphorous 1 mg/l (minimum percentage of reduction of the effluent charge of 80%) and total nitrogen 10 mg/l (minimum percentage of 70-80%)).

An annual tax on wastewater discharges, whatever the origin of water, partially finances investments in collective treatment, through the Funds for the Financing of Water Policy (*Fonds pour le Financement de la Politique de l'Eau*). Most of the funds (taxes plus an annual contribution from the regional budget) pay the services of the operators of the regional treatment plants (South-Brussels operated by CIBE and North-Brussels under BOOT contract with Veolia Water). All discharges are submitted to taxation, except for rainwater collected in rainwater tanks and abstractions from a drill for a domestic use. The tax is set at EUR 0.35 /m³ for domestic uses. For other uses, tax is calculated in function to the polluting charge of wastewater. Industries receive subsidies to invest in installation of pollution reduction (financed with the tax collected).

The target groups are all users that hold a water meter and all persons who own a wells or a spring. The policy is implemented by the Government, the Minister of the Environment, IBDE (CIBE), the regional Finance Ministry, IBGE, and the industrial taxpayer. The action

logic is: *If we order and finance two huge treatment plants, then we will treat all the region's wastewater and fit with the EU requirements.* As the main effect of the policy, two treatment plants in Brussels were ordered and built: the first one in operation since 2001, South-Brussels in Forest (360,000 p.e. and 30% of regional wastewater), and the second one still under construction, North-Brussels in Neder-over-Heembeek (1,100,000 p.e. and 70% of regional wastewater). The investment in South-Brussels represents EUR 87.5mio and more than EUR 1bio for North-Brussels (with a construction cost estimated at EUR 270mio). The treatment plant of South-Brussels does not respect the standards for discharge (and it works at two third of its expected capacity). Corrections measures are under way. The product of the tax on wastewater discharges is entirely affected to the Funds for the Management of Waste- and Rainwater (participation of the Flemish Region to the construction and operation of the wastewater treatment plants in Brussels). In 2003, the Funds represents EUR 21,737,000. Since 2007, the Region will pay an annual rent of EUR 50mio per year during 20 years to Aquiris (the holder of the BOOT contract) for North-Brussels. Additional costs for the construction of prior sewers (EUR 250mio) and the replacement of pipes in lead (EUR 75mio) will increase the financial burden. In the coming years, the Brussels' Government should have some difficulties to finance its sewerage and treatment policies. As a result, a price increase of water for the final consumer is expected.

10.4. SYNTHESIS AND FUTURE TRENDS

10.4.1. Comparison table

From Table 10-4 we draw a perspective of what WSS policies look like in Belgium. We present a national overview to size the country case to an international perspective. However, we must repeat that, in the WSS sector, the policies conducted in the three Belgian Regions are totally autonomous. Belgium is a jurisdictional federation (as well as Canada). At the difference with functional federations (e.g. Germany or Switzerland), the water policy is not designed at the federal level and implemented in the federated entities. This is a reason of growing divergences between the WSS policies conducted in the three Regions. After having insisted on the regional divergences all along the report, we now concentrate on the similarities in the Belgian WSS policies. We observe that these similarities are mainly guided

by the EU requirements and the historical paths (Belgium is a former central State). However, we should not ignore phenomena of policy learning and policy diffusion. Often the Flemish Region developed innovative instruments (e.g. the environmental permit), that were later adopted in the two other Regions.

The preservation of the capacities of production through a renewability of (groundwater) reserves is the main objective of resource management. It responds to the objectives in drinking water production and supply to provide a water of a high quality (healthy and clean) and ensure a sustainable water provision (water withdrawals should not exceed the capacity of renewability of the resource). Other objectives are oriented towards the customer as tax payer and as a client. The efficiency of the sector should be improved and the operators should be able to provide the best service to the client. Access to water should be guaranteed to all in any case. In production, Flanders alone introduces the principle of a quality fit to uses that implies the development of second water circuits supplying "grey" water. In Wallonia, the operators should reach a single production price. In the sewerage and treatment sectors, the objective consists in treating all domestic wastewater (100%). The yield of the treatment plants should be improved, thanks to a reduction of the dilution of wastewater with rainwater, the ultimate goal of treatment being to tackle eutrophication of surface water bodies (and subsidiarily to meet EU requirements).

Instruments are mainly prescriptive and incentive. Concerning the resource access, protection perimeters must be established around wells and prior permits are required for surface and groundwater withdrawals. Production and supply must meet stringent quality and technical standards. These instruments regulate also the provision of services: missions of public service, minimal provision of water (FL) or prohibition of cuts (Bxl). Wastewater discharges are also submitted to a prior authorisation. In Flanders, the separation of rainwater and the installation of a rainwater tank are compulsory, while only encouraged (with subsidies) in Wallonia and Brussels. The choice for individual treatment in rural areas is systematic in rural areas of Wallonia and put at charge of the households (with the support of subsidies). Except direct subsidies to the operators and the communes for investment and operation, incentive instruments are manifold: withdrawals and discharges are submitted to taxation as well as manure disposal in Flanders and the installation of a second circuit and a rainwater tank are financially supported by the public authorities. Informative instruments are limited in

comparison with the two former categories of instruments. Information campaigns are organised about manure and pesticides use, limitation of drinking water consumption and the construction of (separative) sewers. However, mechanisms of cost and yields comparisons are progressively developed as policy and management tools. Self-regulation is residual despite some temporary initiatives, at the notable exception of the code of good practice for the installation of sewers developed in the Flemish Region.

Logically, the main target groups of the WSS policies are the water operators (drinking water producers and suppliers, the communes for sewerage and operators of wastewater treatment). They are subject to prescriptive instruments, but also the main recipients of public subsidies. More and more other target groups are identified and not only as potential polluters: households and farmers in protection perimeters and industries for direct discharges of pollutants. Households are progressively involved in water management as their obligations to save water, separate rainwater or install individual treatment works increase. The Regions are the main actors of implementation, but they are seconded in their role by public water agencies (VMM, IBGE or SPGE). The different water operators (notably Aquafin for wastewater treatment in Flanders) are also involved, particularly as intermediaries between the authorities and the customers (e.g. tax collection by the drinking water suppliers). The communes and the provinces have an organisational function at the local level, particularly for the supervision of construction works or the enactment of local regulation (e.g. on the separation of rainwater).

The role of financial motivation is not negligible in the recent reforms in the WSS sector. Most reforms were conducted with the aim to benefit from tax exemption, VAT exemption more precisely. The first reform was the creation of Aquafin, as a limited company, in 1990. All investments of Aquafin (in the sanitation sector) were exempted from VAT by the Ministry of Finance. Usually, public authorities are subject to an exemption of VAT in Belgium. As such, a part of the money invested by the Regions (21%) comes back to the Public Treasury at Federal level. The Walloon reform that led to the creation of SPGE was made with the same aim. The SPGE is a limited (public) company that is the formal owner of most of the WSS infrastructure. This mechanism allowed the recovery of the VAT not only on new investments, but also on the former constructions. In the Region of Brussels-Capital, The Minister of the Environment is attempting to conduct a similar reform, with a

concentration of the activities in the hands of CIBE. As such, the organisation of the water sector is not necessarily designed in the interest of the resource or more effectiveness or rationality, but by financial and fiscal considerations.

Is there a national model? We observe a regional fragmentation and deepening divergences in the organisation of the WSS sector in the three Belgian Regions as well as in the design of the WSS policies. The progressive integrations of water management do not follow the same path at all. Wallonia privileges a (financial) integration of the WSS sector through mechanisms of redistribution inside the WSS sector. Flanders integrated its policies around the quality of surface water in Flanders. The elaboration of the planning for the construction of treatment plants is prepared by VMM, the agency that realises the monitoring of (surface) water pollution. As such sewerage and treatment are tied to environmental policies and considered apart from the rest of the WSS sector, while in Brussels integration only concerns the WSS sector with a grouping around the historical drinking water operator (under project). However, some similarities between the three regions remain. Production and distribution is dissociated from sewerage and treatment. Each region (except Brussels) counts many operators with distinct statutes: regional companies, inter-communal associations and communal services and companies. Private involvement is limited to the treatment sector, while production and supply is quasi at 100% public.

These similarities are not enough to talk about a national model. However, Belgium provides an example of a co-existence between different management structures and an organisational divide between drinking water production and supply, on the one hand, and sewerage and treatment, on the other hand. The Regions (the legislator) play a dominant role on the conduct of the policies and organisation of the sector, at the detriment of the communes that were historically the competent authorities but tend to consent this loss in competence. Even if local organisations are emerging at the tributary basin levels (11 *bekkencomité's* in Flanders and 14 *contrats de rivière* in Wallonia), their role in the management of water supply and sanitation remains residual. The growing divergence in regional WSS policies attests of the affirmation of the Regions in the management of the WSS sector.



Table 10-4: Synthesis - Belgium

Public policy Water Sector	Objectives	Instruments	Target groups	Actors of implementation
1. Resource access	Renewability of reserves Regional capacity of production	<i>Pr.</i> Protection areas and authorisation for water withdrawals <i>Restrictions in manure disposal (FL)</i> <i>Inc</i> <i>Taxation of manure production and disposal (FL)</i> <i>Inf.</i> Taxation of withdrawals <i>Self-reg.</i> Information about manure and pesticides uses <i>Codes of good practice in vulnerable zones water (FL)</i>	DW producers Farmers Industries and other activities Households	Region (Government, Minister of the Environment and administration) <i>SPGE (W), VMM (FL), IBGE (Bxl)</i> Provinces and communes DW producers
2. Production	Ensure sustainable water provision Water of a high quality <i>Quality fit to uses (FL)</i> <i>Limit water dependence (FL)</i> Better efficiency <i>Harmonise production price (W)</i>	<i>Pr.</i> Quality and technical standards Capacity of expropriation <i>Inc.</i> Subsidies for investment and operation <i>Inf.</i> <i>Cost comparison (FL)</i>	DW producers	Region (Government, Minister of the Environment and administration) <i>SPGE (W), VMM (FL), IBGE (Bxl)</i> Provinces and communes (<i>FL</i>)
3. Supply	Healthy and clean water The best service to the client <i>Water quality fit to uses (FL)</i> Better efficiency Water supply to the Poor	<i>Pr.</i> Quality at the tap <i>Second circuit (FL)</i> Obligations of public service <i>Minimal provision of water for free (FL) or prohibition of cuts (BXL)</i> <i>Inc.</i> Subsidies for investment and operation <i>Subsidies for installing 2nd circuits and rainwater tanks (FL)</i> <i>Inf.</i> <i>Campaigns about limitation of consumption (FL)</i> <i>Cost comparison (FL)</i>	DW suppliers Communes (price setting) Individuals Poor households <i>Industries (FL)</i>	Region (Government, Minister of the Environment and administration) <i>SPGE (W), IBGE (Bxl)</i> DW supplier <i>Hygiene inspection (FL)</i> <i>Regulatory authority (FL)</i>
4. Sewerage	Treat all domestic wastewater Fight against dilution <i>Balance between collective sewerage and individual treatment (W)</i>	<i>Pr.</i> <i>Obligation to separate rainwater and to install rainwater tanks (FL)</i> <i>Individual treatment in areas <2000 p.e. (W)</i> <i>Inc.</i> Subsidies to communal investment in sewers (extras for separation) <i>Inf.</i> <i>Code of good practice for the construction of sewers (FL)</i>	Communes Households Industries and SMEs <i>Aquaфин (FL)</i> <i>IBrA (Bxl)</i>	Region (Government, Minister of the Environment and administration) <i>SPGE (W), VMM (FL), IBGE (Bxl)</i> Provinces and communes <i>Aquaфин (FL)</i> <i>Ministry of Public Works (Bxl)</i>
5. Treatment	Fight against eutrophication Limit penalties of the EU Connect 100% houses to treatment Improve yields of treatment plants	<i>Pr.</i> Environmental permits <i>Revision of discharges standards for treatment plants (W)</i> <i>Communal competence on treatment plants < 2000p.e. (FL)</i> <i>Inc.</i> Taxation of discharges Regional allocation <i>Financial incentives to Aquaфин (FL)</i> <i>Inf.</i> <i>Cost comparison and publication of yields(W)</i>	Operators of treatment Communes Households Industries and SMEs	Region (Government, Minister of the Environment and administration) <i>SPGE (W), VMM (FL), IBGE (Bxl)</i> Operators of treatment Provinces and communes <i>Ministry of Public Works (Bxl)</i>



10.4.2. Emerging legislation

In the present part, we briefly present the main pieces of legislation under adoption. We pay attention to what is going to change in comparison to the past situation and analyse the factors of change. At last, we stress the point of the privatisation and liberalisation processes in the other utilities sectors.

10.4.2.1. Pending legislation

In Belgium, water management is and will remain a regional competence. The conduct of water policies in the three Regions is more and more divergent. As such the three Regions manage their own agenda regarding water issues. In Flanders, changes will turn to be more organisational than legislative as the different reforms in the water sector have already been adopted. In a coming future, the management of local sewers and treatment plant could be given to *waterschappen*, i.e. local authorities in charge of water management that could build, operate or control the infrastructure, including the individual treatment works (and finance it through lease-contracts). The operation of small-sized collective treatment plants (KWZIs) could be split per tributary basins, giving birth to small Aquafins. As combined with rumours on the dismantling of the regional drinking water supplier VMW in provincial units and the sale of the Region's shares in the company (De Morgen, 04.03.2004), the Flemish WSS sector seems to evolve towards the Dutch model.

In Wallonia, reforms are going on. One of the main ambitions of the Government is to restructure the WSS sector. The Government do not accept the huge differences in water prices (from 0.6 to 2.5 EUR/m³). It set the objective to determine one single production price and to tend to one single retail (or distribution) price (or at least a single price structure). The first measure taken concerns water tariffs. After months of debates about the introduction of a progressive water price that should discourage wasteful water uses and charge "excessive" or "luxury" consumptions more heavily, the outcome is rather disappointing. The water price structure will be constituted of three blocks, with the first 30 m³ at mid-price and exempted of sanitation taxes and the great consumption (above 5,000) with a rebate of 10% on the supply



cost²⁸¹. In order to reach the single production price, the Government intends to restructure the sector, giving birth to one single drinking water producer. The sector should be reorganised around SPGE and SWDE. Different structures recently created by the operators could announce upcoming mergers. S.A. Aquawal, resulting from the merger between the former professional association and SOWE, a shareholder of SPGE in the hands of the operators, groups all the regional operators and represents them at SPGE (and holds 24% of SPGE). Anthropia scrl groups the operators of the provinces of Hainaut, Walloon Brabant and Namur, representing them at SPGE and coordinating their activities. APDE GIE grouping the operators of the provinces of Liège, and ICFE the ones of Western Hainaut. The two former organisations have the same objectives as Anthropia. They are not precisely new companies, but rather inter-company partnerships on specific activities (e.g. coordination of public works). However, they constitute embryos of consolidated inter-communal operators. At the same time, privatisation is not on the agenda. The Government continuously mentions its commitment to maintain a public control on water management.

In the Region of Brussels-Capital, the Minister of the Environment prepares a merger of the different operators in the Region into one, around the historical operator (CIBE). His main objective is to recover VAT (EUR 4mio/year) on the construction of infrastructure and reduce operational costs (EUR 1.5mio/year). As well as in Wallonia, the objective of an harmonisation of the water price (uniform average price) is also mentioned. Here again, public authorities should keep control on the activities, and according to the Minister, the reform would avoid any privatisation.

10.4.2.2. Overall trends towards liberalisation and privatisation

In Belgium, the structural conditions are in place for liberalisation and privatisation of the WSS sector, ideas and beliefs as well. In most cases, the public shareholders of the public operators have no legal barriers to sell their shares to private interests. The maintenance of the sector into public hands is not legal any more, but only political. Let alone water, many public utilities are submitted to different forms of privatisation and liberalisation. It resulted initially

²⁸¹ Inspired by the principle of full-cost pricing, the bill distinguishes between the full supply cost (CVD) and the full sanitation cost (CVA). The full supply cost corresponds to the production cost and the full sanitation cost to the sanitation charges. The calculation of the three blocks is then the following: 0-30m³ = 0.5CVD; 30-5,000m³ = CVD+CVA; >5,000m³ = 0.9CVD+CVA.



from pressures of the European Union, but the patterns for change are national as well: financial difficulties of the public authorities (reduction of deficits and indebtedness in order to conform to the Economic and Monetary Union requirements), structural difficulties of public companies (reduction of public subsidies, decrease of the market share due to an opening to competition, difficulties to adapt to technological change, structural deficits and indebtedness), and pressure from the Regions to get control of these (still) national competencies. As such, all utilities sector in Belgium are under reforms. Most of them are still federal competencies, except the water sector, regionalised in 1980.

The Federal State progressively disengages himself from the utilities sectors. In the energy sector (gaz and electricity), the leader in energy production (Electrabel) was privatised, with retail supply given to (mix) inter-communal associations (managed by Electrabel under the responsibility of the communes). The energy markets are going to be fully opened to competition. Private energy producers and suppliers penetrate the market, but without really altering the domination of the historical operator. In the air transport sector, the national company (Sabena) was declared bankrupt in November 2001. Flanders hopes for a regionalisation of the Brussels' international airport (located in Flanders), currently managed by a public company (BIAC). The national Post faces important structural difficulties of all the public utilities in a highly competitive market. It suffers from the decrease of mail and faces tough competition of world operators in parcel post (de facto even on the market of letters under 500g). In the railways sector, the national public company (SNCB) opposes to a regionalisation. However, due to European requirements, the company will be split in three entities (one manager of the network, one operator, and one holding company heading the two entities). Finally, in the telecom sector, Belgacom is partially privatised and since the transfer of the pension funds to the Government, the company is ready to be introduced on the stock exchange (the Federal State remains the main shareholder with 50% of the capital plus one share). In contrast with other public utilities, Belgacom remains profitable and succeeded in maintaining its market share in spite of tough competition²⁸². As such, we observe a general

²⁸² It should be noted that Belgacom keeps its dominant position thanks to a favourable legal environment. Belgacom keeps the monopoly on the local loop (*dégroupage de la boucle locale*). As, all competitors of Belgacom must negotiate with the historical operator in order to get access to the customers, except for mobile telecommunications and the Internet through the cable TV. Furthermore, tariffs of local phone are artificially kept at high levels.

disengagement of the Federal State from the transport and utility sectors. Privatisation is quite general while in most cases liberalisation is not yet effective for the retail consumer (e.g. private monopoly in the telecom sector and residual competition in the energy sector). Why would the WSS sector not follow the same path? Idea that water is something special, i.e. a natural monopoly and an unsubstitutable and vital good, will not suffice to convince policy entrepreneurs to keep it in the public sector.

10.5. CONCLUSION

The purpose of this report was to analytically present the current legislation that regulates the water supply and sanitation sector (WSS) in Belgium. To this end, and after a short history of the regulation and presentation of the sectorial actors and competent authorities, we conducted a policy analysis of the current legislation about resource access, drinking water production and supply, sewerage and treatment. It comes out of the picture that WSS policies are widely developed and divergent from one Region to another.

If we now concentrate on future challenges, we identify many issues at stake concerning the shift to *integrated water management*, the rationalisation of the WSS sector and the programmed increase of water tariffs. Concerning integrated water resource management, the Water Framework Directive (WFD) is still to be transposed in the Region of Brussels-Capital and the Walloon Region. Not much innovation is awaited there, as Brussels has a urban territory that limits the extent of interventions on the environment, and Wallonia has already implemented much elements of the WFD: the Walloon Government should be designated has the competent authority for the management of the two (fragments) of river districts (Scheldt and Meuse) and the river basins are already delimited. In Flanders, the challenge lies in the implementation of the Regional Act on integrated water management and the Regional Act about water intended for human consumption. The Region wants to preserve the renewability of its aquifers. Thus, an increase in drinking water production from surface water and related investments in infrastructure are expected. *Three questions remain concerning the linkage between the WSS sector and the water resource:* Will the current legislation be able to guarantee the renewability of drinking water sources and the coexistence between the exploitation of the resource and the preservation of the ecosystems? If not, more and more investment will be necessary to "produce" drinking water with the consequence to abandon

the target of a pure and healthy environment. The second question concerns water floods, in a context of forecasted increases of rainfalls. Do the installations that separate wastewater and rainwater take the forecast of increased rainfalls into account? Should we increase the capacity of the sewerage infrastructure to face violent rainfalls? Who should then pay for the fight against floods, the drinking water consumer or the taxpayer? What is the limit of integration of costs in the bills of the water consumer according to the cost recovery principle? The third question is again related with price: Will the resource cost finally be included in the water price, as a consequence of the application of the cost recovery principle? The resource cost correspond to the value of the resource withdrawn (e.g. if it was allocated to other activities, including the functioning of the ecosystems). For the moment, the impact of water withdrawals is not appreciated in economic terms yet.

The trends of the *re-organisation of the WSS sector* in Belgium are not clear. Will the use of grey water expand substantially? Will it be provided by private operators, in competition with the historical drinking water operators? Will the competition in water supply be systematised in Flanders? Some pieces of legislation that have been adopted recently open the possibility of a privatisation/liberalisation of public infrastructure (competition for the market). If mergers between the current operators are envisaged in the three Regions, no significant move in that direction has occurred for the moment. Further, we observe attempts of the drinking water supplier to diversify their activities. They develop consulting activities to the communes (e.g. for the management of sewers) and diversify their services to industries and households. They also offer their experience in water management abroad. It is still difficult to imagine new cross-border drinking water transfers, e.g. CIBE that delivers water in France, AWW in the Netherlands, or SWDE in Germany. However, in the particular case of Wallonia, if Flanders continues to decrease its water purchase, the Walloon drinking water producers would seek for new market opportunities abroad.

Increases in *water prices* are regularly announced by the Government. The main reasons of this increase are the recovery of investments planned in wastewater treatment and sewerage, but also the expected replacement of pipes in lead. In the worst case, the water price should not rise above 30% in the next ten years. Combined with the direct increase of the water bill, households will face additional costs to conform to the technical standards introduced by the 1998 Drinking Water Directive for domestic sanitary installations. In a context of a rise of



poverty, water will inevitably increase its share in families' expenditure. Uncontrolled price increases would contribute to a decline of the living standards of households, even if until now Belgium faced no widespread difficulties in keeping water affordable.

At least, the institutional organisation of Belgium will limit the ability to get a critical mass in the re-organisation of the water operators, and to manage effectively the national resources. Water policies in Belgium suffer of an absence of *coordination between the Regions* as river basins are transboundary. As a consequence, the International Commissions of the Scheldt and Meuse are subject to much expectation that they become the arenas where this coordination would take place. A rapid growth of these organisations is possible, as they become true coordinators and play an effective role at the operational level. All in all, the enactment of the WFD announces wide changes in the water sector. It gives the signal for change, rather than being the final point to the (re-)structuring of the European water policy.

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11. CHAPTER 11: COMPARATIVE POLICY ANALYSIS OF LEGISLATION IN THE WATER AND SANITATION SECTORS IN EUROPE

11.1. INTRODUCTION

This chapter presents the results of a comparative policy analysis of legislation and emerging regulation in the water supply and sanitation sector (WSS). It describes the current administrative regulatory framework that governs the WWS sector in different countries and attempts to identify the future trends in the evolution of the legislation. Comparative policy analysis provides the methodological tools of the present report (see Chapter 1). The comparison is backed on selected case studies that were conducted separately.

We intend neither to elaborate a ranking of the different countries put under scrutiny, nor to provide an in-depth explanation of the convergences and divergences observed. Our intention is to provide a comprehensive analysis of the legal environment of water actors in order to guide the elaboration of scenarios, indicating some crucial variables that should be included into the scenarios.

The comparison of the nine country chapters is conceived as a synchronic analysis along the analytical dimensions presented in Chapter 1. Comparative tables, that aggregate national data, follow the representation of the policy cycle, focusing on four policy elements: policy problems, policy content, policy network, and policy outputs (see Table 11-1). Initially, the different policy problems are identified in the selected countries, as well as the availability and pressure exerted on the water resource by the different human uses of water. Secondly, the policy content of current water policies is detailed, with a particular focus on policy objectives and policy instruments. Afterwards, attention is paid to the organisation of the water sector, notably on operators' status and financial flows. Then we look at the outputs that water policies produce (e.g. percentage of the population connected to a wastewater treatment plant). Finally, we compare the legal opportunities for market competition in the water sector.

Table 11-1: Presentation of the comparison tables

Policy problems	Policy content	Policy network	Policy outputs
Table 11-2: Drinking water supply and demand	Table 11-3: Instruments common to the water policies of the selected EU countries	Figure 11-1: Dominant types of public and private actors in selected EU countries	Table 11-5: Outputs of national policies in the WSS sector
		Table 11-4: Financial flows (taxes and bills) in selected European countries	
	+ Policy challenges: Table 11-6: Liberalisation practices		

As such, this chapter successively presents the problems related to pressure on the water resource (Part 11.2), and the comparison of WSS policies (Part 11.3), including policy objectives, policy instruments, policy network, and policy outputs. Finally, we look at future trends in water planning and management, with a particular attention given to the opening of the WSS sector to competition (Part 11.4).

11.2. POLICY PROBLEMS IN THE WSS SECTOR

In the present part, we identify the main problems or issues to be solved by the WSS policies. This identification is based on actual water uses and rivalries between users. We also provide an assessment of the relative pressure of drinking water abstraction on the water resource.

11.2.1. Resource Availability and Drinking Water Supply and Demand

At first sight, we observe a great disparity in the availability of the water resource (see Table 11-2). From Belgium (1,619 m³/capita/year) to Sweden (20,200 m³/capita/year), European



countries have unequal endowments in water resources. Paradoxically, water is not scarcer in Southern countries than in Northern ones. Belgium, Germany and England & Wales²⁸³ have less water resource available per capita (respectively 1,619, 2,218 and 2,694 m³/capita/year), than Italy, France²⁸⁴ and Spain, and Portugal (with respectively 3,040, 3,265, 2,797 and 7,281 m³/capita/year). This favourable situation can be partly explained by the presence of high mountains (e.g. the Alps and the Pyrenees). It needs to be stressed that these data are aggregated at country level and hide situations of local scarcities as much in Southern countries (Portugal, Spain and the South of Italy), as in Belgium, Germany and England & Wales, where important pressure can be put locally on the resource. It is worth mentioning important intra-country differences such as in Belgium, where Flanders has low and depleted water reserves for drinking water production, or in Spain where the rising importance of water transfers increases water availability in some regions.

The disparity between countries is also reflected in the total water withdrawals. In absolute terms, the most important volumes of abstractions are located in the most populated countries (32,323 mio m³/year in France and 40,590 mio m³/year in Germany). In Southern Europe, Italy withdraws 55,702 mio m³/year, while Spain withdraws "only" 26,053 mio m³/year. At the other extreme, the Netherlands has a low level of abstraction (4,655 mio m³/year), a position confirmed when looking at the level abstraction per capita (300 m³/year). Belgium is not a country under "water stress" anymore when one considers abstraction per capita (730 m³/capita/year) rather than resource availability (1,619 m³/capita/year, i.e. under the threshold of 2,000 m³/capita/year) (Gleick 1993). It even scores better than most countries (495 m³/capita/year for Germany and 553 m³/capita/year for France). Per inhabitant, southern countries withdraw much more water. Spain has a relatively low level of abstraction (656 m³/capita/year), compared to Italy (976 m³/capita/year) and Portugal (1,102 m³/capita/year). In general, water is mainly used for the cooling of power plants (for more than half of total abstraction), except in Southern countries where irrigation takes the most part of water (82% in Spain, 75% in Portugal and 48% in Italy) (Eurostat 2003a): this means that this water actually used is also consumed (which is not the case for cooling activities in which water

²⁸³ Data for all UK.

²⁸⁴ France, that has only an opening on the Mediterranean coast.

goes back directly to the resource). Here France distinguishes itself from the other southern countries due to the important number of nuclear power plants located on its territory.

The most interesting observation here is that **a direct link cannot be established between absolute availability of water and withdrawals per capita**. It is not because a country has more water available that it withdraws more water from the natural environment. For example, a Swedish citizen that has available the largest water resources (available 20,200 and withdrawing 303 m³/capita/year), withdraws far less compared to a Portuguese citizen (available 7,281 and withdrawing 1,102 m³/capita/year). Furthermore, we observe no immediate correlation between the population density and the pressure exerted on the resource (ratio abstraction/availability). Belgium and Italy have a high ratio with a high population density, but Spain and the Netherlands appear as counter-examples, Spain having a high ratio for a low population density and the Netherlands a very low ratio for the highest population density. The natural conditions (resource availability) and the share of abstractions for irrigated agriculture seem to be more powerful explanatory factors of the different national situations than eventual differences in needs or habits concerning domestic consumption of drinking water. Abstractions of water intended for human consumption represent varying shares of the total abstraction from one country to another, from 7.86% in Portugal to 37.67% in the United Kingdom. The average share of drinking water in total abstraction is around 15%. As such, the pressure of the WSS sector on the resource should not be overestimated when compared to other uses, i.e. industry and agriculture²⁸⁵.

²⁸⁵ It is true however, that domestic consumption is an important pollution source (e.g. discharges of nitrogen) and that most of industrial withdrawals are for cooling purposes.



Table 11-2: Drinking water supply and demand

Countries	B	F	E	NL	S	I	P	D	E&W								
Density (inhab./km ²) (2001)	337.1	108.8	79.8	473.7	21.6	192.2	112.1	230.6	241.3								
WATER SUPPLY²⁸⁶																	
Availability of the water resource (m ³ /capita/year)	1,619	3,265	2,797	5,788	20,200	3,040	7,281	2,218	2,694								
Withdrawals (m ³ /capita/year)	730	553	656	300	303	976	1,102	495	300								
Withdrawals (mio m ³)	7,443	32,323	26,053	4,655	2,688	55,702 (estimates)	11,090	40,590	15,884								
Drinking water withdrawals (%) of which	Surface Water (%) Groundwater (%)	9.81 64.66	35.34 61.56	18.25 38.44 ²⁸⁷	14.74 24.17	75.83 64.25	27.22 35.75	34.34 48.97 (incl. 24% artificial)	51.03 85	18.00 85	15 ²⁸⁸ 54.01	7.86 54.01	45.99 73.82	13.69 26.18	26.18 73.82	37.67 29.66	70.34
Agriculture (%)	0.24	9.84	81.90	4.94	5.58	48	74.80 ²⁸⁹	0.50	11.82								
Industry process (%)	22 ²⁹⁰	11.50	2.85	15.90	52.31	19	4.40	20.52	10.06 ²⁹¹								
Cooling (%)	67	60.32	-	51.79	3.61	14	14.10	65.26	38.27								
DRINKING WATER DEMAND																	
Consumption	Total (mio m ³)	559,4	4,000	3,784	1,248	730	2,100	5,785 ²⁹²	4,859	5,472							
	Per capita (l/day)	113	165	174	129	162	236	184	129 ²⁹³	134/152 ²⁹⁴							

²⁸⁶ Eurostat (2003a) for the whole table, mentioned in italic otherwise.²⁸⁷ IFEN, 2002; Agences de l'Eau, 2002²⁸⁸ Year 2002, observation for 52 ATOS out of 91.²⁸⁹ INAG (2000).²⁹⁰ Belgaqua (2001).²⁹¹ Figures taken from Defra (2003) and referring to 2001.²⁹² INAG (2000).²⁹³ Considerable differences exist across the different German Länder: from 154 l/inh./day in Schleswig-Holstein to 86 l/inh./day in Thuringia.²⁹⁴ 2000-01: 134 l (metered supply) – 152 l (non-metered supply); (OFWAT, 2001)

In most countries, two third of drinking water is produced from aquifers. This rate represents 85% in Italy. All countries partly use surface water to produce drinking water, but surface water is used in majority only in Spain and the UK, with respectively 75.83% and 70.34%.

If we look at the demand in drinking water, we observe logically high disparities in the overall consumption, but when related to consumption per capita, the volume of domestic consumption varies from simple to double. Belgium has the lowest rate of consumption with 113 l/day, while Italy has the highest with 236 l/day. The differences are partly explained by self-supply (e.g. with watering from drills), and over-estimates occur in countries where a substantial amount of water is used for tourism²⁹⁵. This level however remains low compared with the United States, which consume 400 l/capita/day (or Switzerland to a lesser extent). However, most European countries consume less than 165 l/capita/day of drinking water.

11.2.2. Problem Pressure concerning Drinking Water

This section identifies the major problems (of quality and quantity) and actual rivalries that drinking water production faces in the different countries, with an emphasis on the most acute ones.

The main rivalries in resource appropriation between the drinking water sector (approximately 15% of total water abstractions) and other uses, concern the **pollution from agriculture** and its impact on water quality. In fact, intensive farming requires the use of fertilizers and pesticides that spread into the ground or flow to the rivers. Residues of fertilizers and pesticides pollute aquifers and surface waters with nitrogen, phosphorus and various hazardous substances. This problem is a major one in all the countries under study. Manure disposal is the main source of agricultural pollution. Manure is used to fertilise the ground, but its excessive disposal does not improve crop yield but rather contaminates the ground and the aquifers and therefore depletes drinking water resources. In certain regions (e.g. Flanders in Belgium, most parts of the Netherlands, Baix Ter aquifer in Catalonia (Spain) and Brittany

²⁹⁵ “The amount of water used per capita per day is calculated using the total population of the country. As a result, the quantity of water used per capita is underestimated for countries where a significant proportion of the resident population is not connected to the distribution network. The quantity may also be overestimated in countries where a substantial amount of water is used for tourism” (Eurostat, 2003b: 3).



in France), intensive pork and poultry husbandry produces manure surplus that is spread on lands as this is the cheapest way for farmers to evacuate it. This problem is pointed out in every country, and is at least identified as a minor problem. Pesticides use is also a constant problem, and overcoming it would imply a heavy structural change in the agricultural sector in western Europe.

A second problem is **over-exploitation of the water resource by agriculture**. Actual rivalries between abstractions intended for drinking water and irrigation occur in France, Spain, Italy and Portugal and this problem is obviously the most acute one in Spain. More locally, we point out desiccation problems in the Netherlands, where the depletion of aquifers is mostly caused by agriculture (60%) and by drinking water production (30%).

The **pollution of surface and groundwater due to industry** is also predominant in all the countries. It is mainly due to discharges of hazardous substances in surface and groundwater. Residues of these substances are then found again at the tap. The overall concentration of hazardous substances in water is worrying in all the countries of our empirical sample. In fact, excessive discharges of hazardous substances are still pointed out in all countries, in spite of generalised permit schemes for industrial discharges. Traces of hazardous substances are found in the environment, notably in wild fauna and mainly in fish, birds and mammals. Moreover, the discharge of nutrients by industry is identified as a minor problem, even if much effort was consented by industries (and public authorities) to build industrial treatment plants. The food sector is responsible for emissions of nutrients in industry.

Some problems between drinking water supply and other human uses are specific to particular places. We point out excessive uses of water by golf clubs around the Mediterranean Coast in France, pollution of rivers due to drainage waters in Flanders (Belgium), a threat on river ecosystems in the coastal areas of Spain, bacteriological pollution and toxic substances in the Po plain in Italy, mercury pike levels in many Swedish lakes (40% of them), and contamination of surface waters through (accidents in) traffic on inland waterways in Germany. Also, some of the main problems that we pointed out above are not generalised to the whole country, but are specific to certain areas. For instance, the rivalry in abstraction between agriculture and drinking water production is observed specifically in France in the surroundings of Lille and along the Mediterranean coast. In Spain, it is most specifically acute

in the Autonomous Community of Andalusia, then in the south of the country. As such, the presence of problems is not systematically widespread on the national territory, but more localised pressure should be subject to local policy responses.

In more general terms, we observe great similarities of rivalries between all the countries, even if the hierarchies of policy problems differ. In Spain, the most acute problem that meets drinking water supply concerns water quantity and agriculture. It is related to over-abstraction, particularly in aquifers (this is true also in the Lille aquifer in France). In the other countries, one of the main problems still concerns agriculture, but this time as a water quality problem, due to the pollution of surface and groundwater by the disposal of fertilizers and pesticides. Industrial pollution is a second one. These three kinds of problems are present in all the countries under study.

11.3. CONTENT OF WATER SUPPLY AND SANITATION POLICIES

11.3.1. Policy objectives and Instruments

We identify the main explicit objectives and instruments, as formulated in the laws and regulations, of the WSS policies. We point out similarities and differences across the sub-sectors of the WSS chain (drinking water production, distribution, sewerage and treatment) and/or across countries.

11.3.1.1. Policy Objectives

Ecological and economic objectives are converging. The quality of the water resource as well as improvements in efficiency and productivity gains are the leading objectives in most of the countries put under scrutiny. These objectives are already compatible with the Water Framework Directive (WFD), and were often initiated by the European Union. In the social field (e.g. price affordability or improvement of the standard of living) however, we notice important disparities between the countries. We remark that the social dimension of water policy is also less developed than the economic and ecological dimensions in the WFD content (see also EUROMARKET (2003)).



The European countries are **converging on ecological objectives**. Ecological protection of water resources is a priority in all the countries. The objective of a **good status** for both surface and groundwater, as stated in the WFD, is already transposed in all the countries, except in France. However, the convergence on ecological objectives is not so recent. When looking at the details of the policy objectives, early formulations attest of this common concern. Spain is concerned about the restoration of polluted groundwater or the protection of surface water and dam reservoirs for drinking water production purposes, Sweden about the protection of ecological areas, in particular for water abstraction, and Germany aims at maintaining or restoring the ecological balance of waters (which all countries basically aim at under the WFD).

Ecological objectives have not been developed with the single aim to protect nature. In many countries, they are strongly correlated with the need to **secure drinking water supply** (Belgium, Sweden, Spain and Germany, for instance). This partly fits the requirements of the 1975 directive on the protection of surface water intended for the abstraction of drinking water (European Communities 1975), i.e. the respect of quality standards for the raw water used in drinking water production. In order to comply with minimum standards for raw water, Belgium, France, Germany and England & Wales notably regulate manure disposal. Intensive catering and the resulting evacuation of surplus manure put pressure on the aquifers and the environment in general. In these countries, the concentration of nitrogen and phosphorus in aquifers has attained worrying levels. The measures taken to limit manure disposal go far beyond the requirements of the 1991 Nitrates Directive (European Communities 1991b). Before the WFD is enacted, the European law contributed to the development of ecological objectives, but it is certainly not the only one factor explaining this development.

Besides this convergence in some ecological objectives, the **protection of water ecosystems is not so widespread**. In fact, the protection of wetlands is not systematically referred to. Wetland protection only seems to be a preoccupation in Belgium, France, Spain, Germany and England & Wales, in spite of the international law that has developed since the Ramsar Convention of 1971. Some other particular objectives are pointed out in different countries. One can also notice the Dutch specific objective of "giving space to water" (*Ruimte voor Water*). This consists in developing a water management that respects the natural flow of water in particular in freeing the major bed of the river. It intends to coordinate land-use



planning with water policy. This concern is also emerging in Flanders (Belgium) in the context of the development of an integrated water management. The objective is not strictly environmental, but closely tied to flood protection.

Convergence on the economic objectives is also observed. The main theme of current economic orientations in water policy is **cost recovery**. The final consumer should directly pay all the costs incurred by WSS services. The cost recovery principle is going to be implemented (in line with the WFD) by the means of the full-cost pricing, i.e. the consumer would pay all the related costs in his water bill²⁹⁶. In practice, the principle is never implemented strictly (i.e. maintaining of public subsidies). Cost recovery is a prior objective in six out of nine countries.

At the edge of economic and social objectives, one finds the question of secure and reliable provision of drinking water. The development and securing of drinking water provision is the first priority for Belgium and Portugal. However the situation is different in the two countries. While Portugal aims at improving its rate of connection to the drinking water supply and sanitation sector, Belgium attempts to preserve the quality of raw water in order to minimise drinking water production costs. In another perspective, Spain's absolute priority in water policy remains oriented towards economic development, notably with the encouragement of large scale water transfers and with low water prices for farmers.

Social concerns are less taken into consideration than ecologic and economic ones. Great **disparities in the formulation of social objectives** are observed. We approach social objectives through what makes a public service or a service of general interest (see EUROMARKET 2003: 12): the quality (plus continuity and reliability) of the service supplied, its access to all at any point of the national territory and its affordability (access to all through affordable pricing). There is no doubt that the objective of **provision of a water of a good quality** has social ramifications. This objective has been made compulsory by the European Union since the early 1980s and all the Member States conform to the rule (European Communities 1980 and 1998). However, the difficulty to obtain a constant and

²⁹⁶ While up to now, mainly financial costs are included in the water bill, the WFD requires an "adequate contribution of the different water uses... to the recover of the cost of water services" including also environmental and resource costs. – see article 9.



widespread respect of the quality standards of drinking water (e.g. due to meteorological conditions or isolated problems on local networks) explain that quality issues remain prior objectives in many countries.

Other social objectives are more specific to countries. The objective to ensure drinking water supply to all is only referred in four countries (Portugal, Germany, Belgium and Italy) (indistinctively by access through connection or price). **Access to the service** is not anymore a problem, as connection rates to drinking water supply are close to 99% everywhere, except in Portugal and Spain (see Table 11-5). In Portugal especially, the objective of access to all remains tied to offering a connection to drinking water in isolated areas. In all other countries, the objective of access to all refers to the affordability of the service.

Concerning affordability, there is no convergence at all between the countries. In countries where social objectives are mentioned, each country developed its own correction mechanisms to maintain the affordability of drinking water in a context of price increases. To supply drinking water to all is explicitly mentioned as an objective in Germany, England & Wales and Belgium, as well as the prohibition of supply cuts (limited to the Brussels-Capital Region in Belgium). Affordability is also targeted with mechanisms of solidarity, i.e. the constitution of **solidarity funds** financed by a withholding on the consumer's bill and intended to make up for the water bills that people cannot afford. This mechanism is developed in France, Belgium, and in a lower extent in England & Wales. Disparities are also important concerning **social tariffs**. The Flanders Region of Belgium is unique in offering the first cubic meters for free (15 m³/capita/year in Flanders). Otherwise, some social tariffs exist in Spain (licence fee much smaller for poor households in Barcelona), Sweden, Germany (social services provide income support on an individual basis) and England & Wales (affordability measures for water bills). However, these measures are dissimilar and often developed at the local level either by the municipalities or the operators themselves.

In general, we observe a convergence on ecologic and economic objectives. In Belgium for instance, the protection of the water resource is conducted with the final aim to secure drinking water provision. The objectives purely centred on the protection of ecosystems are more limited, e.g. the protection of wetlands. These ecological objectives are coupled to economic ones, mainly the cost recovery principle, sometimes combined with the polluter

pays or resource users pay principles. Such principles legitimise the cost increase necessary to finance huge investments in resource protection (protection perimeters, sewage collection and treatment infrastructure, etc.), or sometimes a development of supply or the construction of drinking water treatment plants. A secure and reliable provision of drinking water, with a broader objective of public health in the background, remains central. More disparities appear in the formulation of social objectives, particularly on price affordability. These objectives are coherent with the policy problems identified that particularly emphasise on problems of pollution and over-abstraction of the resource. The dominant rationale of the WSS policies is the following: "If we protect the natural resource, then we secure our provision in good quality drinking water at the lowest possible cost". The costs of the WSS policies are mainly assumed by the domestic consumer, although domestic consumers are necessarily responsible for some important pollution problems (manure disposal, over-abstraction or direct discharges for the industry).

This combination of converging ecologic and economic objectives in the countries studied attests of an early assertion of the WFD in the logic of the national water policies already developed. However the hierarchy of objectives differs from one country to another, with a majority putting an emphasis on the economic objectives. Here we find again the traditional division between southern and northern EU Member States, northern countries being more aware of environmental protection (The Netherlands, Sweden and Germany) (Sbragia 1997). We observe in fact that "southern" countries (France, Italy, Portugal and Spain) as well as Belgium put a lesser emphasis on environmental protection than on economic aspects of drinking water management. All in all, a large extent of policy objectives is covered in the different countries quite uniformly, except perhaps the protection of wetlands and social issues.

11.3.1.2. Policy Instruments

Concerning the instruments, we observe important convergence. From the information collected in the country reports, we are able to draw a **standard profile** of public intervention in the WSS sector²⁹⁷. We look at the differences from the standard profile and attempt to

²⁹⁷ Public intervention refers to the development of public policies by public authorities of different levels.

explain them. The European Law is responsible of some of the common features, but in fact most of these common features are not the result of a compulsory harmonisation. Some prescriptive (withdrawing and discharge permits) and incentive instruments (taxation of withdrawals and discharges) are common to the countries without harmonisation being required by the EU. We also remark that there is still a widespread involvement of public money in the sector and that information and self-regulative instruments are less developed.

Table 11-3 presents the common policy instruments that are applied in the national water policy of the selected EU countries. We can easily observe that many instruments are common to the countries (i.e. all the coloured cells), but that only few of them result from a compulsory implementation of the European Law. First of all, common instruments are found in all the sub-sectors of the WSS sector. These instruments are mainly prescriptive (i.e. mechanisms of prohibition/ authorisation, compulsory rules, regulation of practises, etc.) and incentive (i.e. economic instruments, such as tax and subsidies, loans at non-commercial rates, financial penalties, etc.). The more noticeable convergence concerns the abstraction and discharge permit schemes and taxation schemes also related to abstraction and discharge. Despite the absence of EU programmes establishing such policy instruments, all the countries adopted them. In complement, other prescriptive instruments are common to the countries: contracting obligations with the consumer (i.e. signing of a contract between the customer and the supplier, eventually referring to general and particular regulations), installation of a water meter, and obligation to equip all areas. Concerning incentives also, and in addition to taxation schemes, we observe that mechanisms of public subsidies on investment and operation are also generalised (with the notable exception of Sweden and Germany). Not only wastewater treatment is subsidised, but also often the investment and operation in the networks of production and distribution of drinking water (Belgium, France, the Netherlands and Portugal). This can be implemented through direct subsidies or loans at non-commercial rates. As such, public intervention in the WSS sector is quite similar from one country to another.



Table 11-3: Instruments common to the water policies of the selected EU countries

	Access/ Production	Distribution	Sewerage	Treatment
Prescriptive instruments	Withdrawing permit	Quality standards	Prohibition/permit for discharges	Obligation to equip urban areas above 2000 p.e.
	Protection perimeter	Contracting with the consumer		Obligation to equip all areas
	Technical standard for production	Installation of a water meter		Compulsory standards for effluents
Incentive instruments	Abstraction charge	Subsidies on investment and/or operation	Subsidies on investment	Tax on discharges
	Subsidies on investment and/or operation			Subsidies on investment and/or operation
Informative instruments		Information to the consumer about water quality Alert system Rational use of water		
Self-regulative instruments	Code of good agricultural practice	Individual rain water collection ISO standards		Individual treatment

Legend:



Instrument common to the Member States

Requirement of the European Law

Only partially implemented

Nevertheless, some of the common instruments result from a harmonisation of legislation at the EU level. EU standards are well developed, particularly in the distribution and wastewater treatment sub-sectors. The 1980 and 1998 Directives on the quality of water intended for human consumption set up high quality standards for drinking water, as well as programmes of control. The 1991 Directive on urban waste water treatment obliges countries to equip all urban areas above 2,000 population equivalent with a secondary treatment, and tertiary treatment is rendered compulsory in sensitive areas, where the concentration of nitrogen in surface water is already high. The obligation to inform the consumer about the quality of the water he/she receives, the implementation of an alert system and the code of good agricultural practice result from EU requirements, as well as the compulsory standards for the effluents of wastewater treatment plants. Furthermore, some instruments are now required in the EU

directives, but they have not entered into force yet (e.g. technical standards for drinking water production).

Now we enumerate the different instruments developed in the selected EU countries for each sub-sector of the WSS sector. For each sub-sector, we precise the categories of instruments used (prescriptive, incentive, informative and self-regulative), insisting on the similarities and differences between countries. Concerning the access to the resource and drinking water production, instruments are essentially prescriptive and incentive. First, abstraction permits and protection perimeters were set up everywhere, even if implementation deficits are noticed in Belgium, France and Portugal for abstraction permits, and in Belgium, France, Spain, Italy and Portugal for protection perimeters. Another prescriptive instrument, that is the prohibition of manure spreading, completed with an authorisation scheme, is not widespread. This disposition is not compulsory in Spain and Portugal and poorly implemented in France and Italy. Drinking water production is regulated by technical standards everywhere. Concerning incentives, abstraction charges are quite effective everywhere, except in Sweden. Implementation of these charges is lacking in Portugal and the amount withheld in Italy remains symbolic (negligible charges). Protection of the perimeters around abstraction points is only subsidised in Belgium and Germany. Drinking water production remains much subsidised in most countries. Public authorities distribute either direct subsidies to water operators or loans at non-commercial rates in order to sustain investment in infrastructure. Operation costs are also subject to public subsidies, more particularly in Italy and Portugal where drinking water production is almost totally financed by public authorities. On the contrary, there is practically no subsidisation in Germany, even if some Länder financially stimulate investment in infrastructure on a case-by-case basis, but generally not for drinking water production. We find no widespread informative or self-regulative instruments, except the codes of conduct for good agricultural practice (as expected in the 1991 Directive on nitrates (European communities 1991b)) and the promotion of drinking water production from surface water in Belgium (Flanders) and the Netherlands (only forecasted there).

In the distribution sub-sector, all four categories of instruments are used. Above all, prescriptive instruments concern the quality standards for drinking water that are high, compulsory and effectively implemented in all countries, since the enactment of the 1980 Drinking Water Directive (European Communities 1980). In some countries, further missions



of public services are translated into prescriptive instruments, e.g. the obligation of continuity for the water supply service in France and Spain. The obligation to provide a minimal quantity of water for free ($15 \text{ m}^3/\text{capita/year}$) is only implemented in Belgium (Flanders). The prohibition of unilateral supply cuts is also implemented in Belgium (Flanders), as well as in Germany and England & Wales. Water meters are compulsory everywhere, except in Portugal and England & Wales²⁹⁸ and in some big cities, such as Antwerp and Amsterdam, where the reform is under process. The public control on water prices is also widespread, except in the Netherlands²⁹⁹. Incentive instruments in the distribution sub-sector essentially take the form of public subsidies for investment and operation. They are effective in several places, even if they are less developed than in the production sub-sector. In fact, we observe exceptions in Portugal, Germany, and also in Sweden where they are very limited, and in England and Wales where there are no subsidies at all. The installation of a second water circuit of non-drinking water for industrial uses or some domestic uses is still not economically encouraged, the same for rainwater tanks, with the exception of Belgium. Incentive instruments are not always environmental-friendly. For instance, the ecological price structure, with a progressive water pricing for domestic uses that would make abusive uses of drinking water more expensive (e.g. for filling-in a private swimming-pool), is not developed at all. In the field of informative instruments, information to the consumer about water quality has been made compulsory everywhere, as well as alert schemes in case of incidental pollution of drinking water. Localised and dispersed actions in favour of water savings (demand-side management) are developed everywhere, such as information campaigns or lessons at school. As for self-regulative instruments, we observe the widespread certification to ISO standards (ISO 9000 for the quality of the industrial process and ISO 14000 for the respect of environmental requirements in the process).

Concerning sewerage, the prohibition of direct discharges in surface water is implemented in most countries, except Spain and Portugal where the measures exist but implementation is partial. On the contrary, the separation of rainwater from wastewater is not much developed, except in Belgium, France, and Germany. Subsidies for investment and maintenance of the

²⁹⁸ In England and Wales, consumers have a right to demand a meter being installed, but metering is not compulsory.

²⁹⁹ In the Netherlands, the operators indeed can set the tariffs, although the final word is for the public shareholders.

infrastructure are also widespread, except in Spain, England and Wales and Germany. Consecutively to the separation of rainwater, codes of good practice have been developed for the construction of sewers in France, Belgium and the Netherlands.

The treatment sub-sector is dominated by the prescriptions resulting from the 1991 Directive on urban wastewater treatment (European Communities 1991a). All the selected EU countries transposed the obligation to equip areas above 2,000 population equivalent with installations of collective treatment into their national law. In addition, most countries decided to equip all areas with individual or collective treatment plants. This prescription is planned in Italy and Portugal, but not implemented, and also only partially implemented in Belgium, France and Spain. Standards for effluents from the wastewater treatment plants are compulsory and implemented, except some problems of implementation in Spain and Italy. Sewage sludge disposal is restricted in Belgium, the Netherlands, Germany, and France³⁰⁰. Sensitive areas are already defined in many countries, according to the obligation of the 1991 directive (European Communities 1991a). Some countries, e.g. Belgium (in Brussels and Wallonia), even declared that their whole territories were classified as sensitive areas. Concerning incentive instruments, wastewater discharges are subject to taxation in all countries, despite some implementation problems in Spain. Investment in infrastructure is highly supported by public subsidies, except in Germany under the reserve that Länder can launch individual initiatives, and in England and Wales where there are no subsidies at all. The existence of subsidy schemes for individual treatment plants are only mentioned in Belgium, France and Spain.

Despite some difficulties in implementation in some countries, we observe important similarities in instruments used to conduct public policies in the water supply and sanitation sector. These common features are partly due to the European law, but we showed that the phenomenon goes far beyond the strictly compulsory harmonisation process. Such similarities in instruments contrast with the differences in "objective" problem pressures found in the different countries. The availability of the resource, as well as the distribution of the uses differ (e.g. importance of water abstraction for agriculture), as well as the major problems that

³⁰⁰ A specific European Directive concerns sewage sludge in agriculture (European Communities 1986), but its scope is limited to concentrations of heavy metals.

water management faces (e.g. over-abstraction for agriculture). Even if differences in objectives are less noteworthy, the priorities between the countries also vary (e.g. objectives of prevention against the pollution or development of the drinking water production capacity or economic development are only mentioned in few countries). As a matter of fact, **problems and objectives differ** between countries while the **types of instruments are similar**.

11.3.2. Policy Network: Actors and Financial Flows

In the present part, we attempt to develop a typology of policy networks based on the following dimensions: Is there a coordination between national and local levels of power? Is there a division of tasks between public and private actors? What is the degree of (financial) integration of the whole WSS chain (resource access, production, distribution, sewerage and treatment)? In general, we observe that the dominant design of organisation in the WSS sector remains municipal and public. Concerning the financial flows, the drinking water consumer is already the main source of revenue for the investment and operation on the network, with a collection primary assured by the drinking water supplier.

11.3.2.1. Organisation of the Sector

The organisation of the WSS services is still characterised by a great **dominance of public and municipal management**, except few notable cases, e.g. France, Spain and England & Wales. In this part, we provide an overview of how the sector is organised that puts in evidence the similarities and differences between the selected EU countries.

The municipal level dominates the organisation of the WSS sector (see Figure 11-1). Water supply and sanitation operators are still organised at local level and depend on municipalities, be they municipal or inter-municipal companies. There is quite a sectoral difference in some countries, e.g. while the German Regiebetrieb (100% municipal ownership) is quite common for sewerage (around 70%), it is not at all common for drinking water (1.3%). Sweden is the only country that counts mostly municipal companies or services. The dominant organisation is a combination of both municipal and inter-municipal companies or services, present in

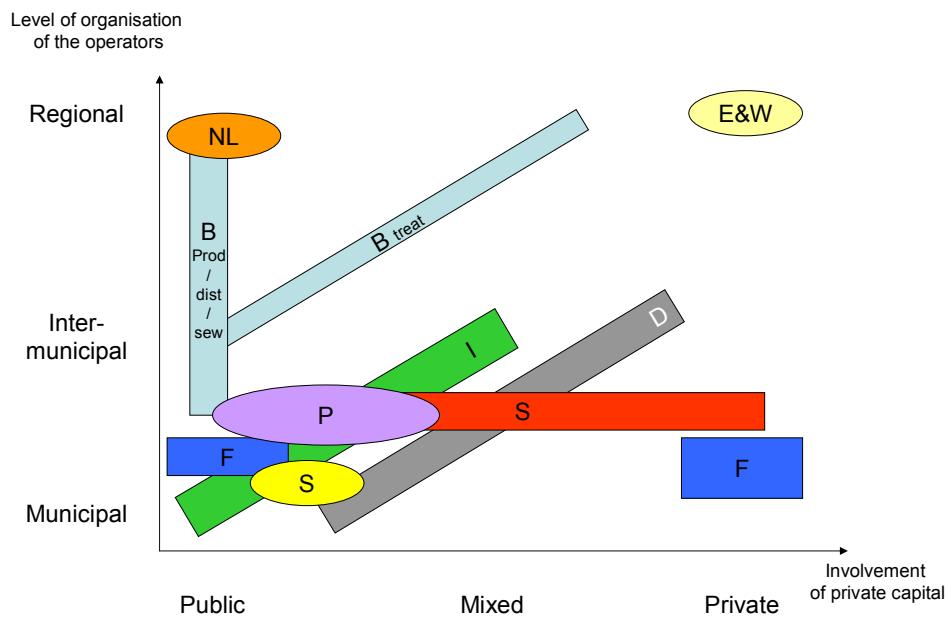
France, Portugal, Spain and Italy. However, this kind of organisation remains driven by the municipalities. Only the Netherlands and England & Wales are organised at regional level³⁰¹. Belgium combines all the levels of organisation. In general, we observe no significant differences in organisation between the sub-sectors (production, distribution, sewerage and treatment), except in Belgium.

Public ownership is still the rule, and private involvement the exception in most countries, even if some competition and private participation are formally (or legally) introduced everywhere (see Table 11-6). The Netherlands remains the only country in which private sector involvement is actually marginal, perhaps along with Sweden. Conversely, England & Wales are the only countries to be fully privatised. In France, the situation is more contrasted. Private management dominates, but management in the whole WSS sector is either directly ensured/provided by the municipality or delegated to a fully private operator. In Spain, different arrangements exist: fully public, mixed or fully private. Portugal, Germany and Italy are led by the public sector, but open to private sector involvement. We observe that **private participation increases when operators are organised at a higher level than the strictly municipal one**. The notable exception to that affirmation is France (and Spain in a lesser extent). This divergence could be explained by the fact that delegated (private) management is operated by big private companies that organise the management of their activity at higher levels of operations. In France for instance, the *Générale des Eaux* (a tributary to Suez) manages municipal WSS services directly from regional offices. As such, it manages together the different municipal contracts that it owns. As a matter of fact, private sector involvement remains an exception in many countries.

³⁰¹ A regional company has a different legal status than an inter-municipal company. Usually, it does not result from a process of self-organisation by the municipalities and generally operates on a larger territory than inter-municipal companies. In a regional company also, the public shareholders are not only the communes, but also the State or a federated entity (e.g. the Region in Belgium). As such, a regional company is not entirely controlled by the municipalities.



Figure 11-1: Dominant types of public and private actors in selected EU countries



Comments: The current figure shows a trend in the organisation of the WSS sector in the selected countries and cannot refer to national specificities. It is worth mentioning some exceptions in different countries. In Sweden, although the main form is public and municipal services or companies, some inter-municipal cooperation is observed (15% of connections) and public-private partnerships exist (in 8 out of 289 municipalities). In Germany, inter-municipal companies represent 20% of the total companies and private involvement (in mix or private companies) 14%. In the Netherlands, sewerage is a municipal competence, and the municipalities are amongst the shareholders of the Public Water PLCs. Only Amsterdam and Tilburg kept a municipal service of drinking water supply. One single case of privatisation is noticed, concerning the construction of a wastewater treatment plant.

After having this broad overview in mind, we present an analysis of the organisation of the WWS sector per country. In Belgium, the WSS sector is mostly public, except for wastewater treatment (in Flanders). Sewerage is municipal and the production, distribution of drinking water is a mix between regional, inter-communal and municipal structures. In Spain, private capital is involved in all segments of the sector. Production and distribution are municipal or inter-municipal and shared between public, mixed, or private companies. Sewerage is municipal and public, except in big cities where private capital is also involved. Treatment is mainly under private hands. In France, the sector is mostly municipal, or sometimes inter-municipal, with private involvement in a majority of situations. In Sweden, the sector is



public and municipal at 85% of the market, the remaining 15% being inter-municipal. In the Netherlands, production and distribution are regional and public, as well as wastewater treatment. Only sewerage is a municipal competence. In Italy, inter-municipal Optimal Territorial Areas (ATOs, *Ambito Territoriale Ottimale*) integrate all the sub-sectors, mainly with mixed capital. The remaining part is public and municipal. In Portugal, although the State developed a regulative framework and incentives to privatisation for these specific sub-sectors, private involvement in distribution and sewerage still remains residual. These sub-sectors are municipal and mainly public. Drinking water production and wastewater treatment are shared between municipalities and inter-communal associations. In Germany also, an increased private involvement is under way in the municipalities. In fact, water operators are mainly municipal and private involvement occurs in 14% of the operators.

We observe that the dominant institutional organisation of the WSS sector in the selected countries is mainly public and municipal. However private involvement is important, even if it is not systematically present in all the sub-sectors. Successive reforms in the WSS sector conducted in the different countries often evolved towards more private involvement, but private actors did not systematically respond to these legal possibilities.

11.3.2.2. Financial Flows

As "What is scarce is not water but money" (according to B. Barraqué), we now turn to the financial flows that cross over the WSS sector. Our reasoning is built around three simple questions: Who pays for what? Who collects? And how are the revenues of the collected charges used? In our examination of the financial flows, we consider water charges of all kinds. Generally these charges are composed of the payment of the service (service costs), taxes, fees and subsidies. If the main difference lies between taxes and service costs, this difference is not clear-cut in the WSS sector as many taxes are reallocated to resource management and investment in infrastructure. This situation constitutes an exception to the general principle of non-allocation of receipts in public budget. In the WSS sector, the charges that are collected are directly invested in operation and infrastructure in most countries. Our intention with Table 11-4 is not to present a list of which taxes are included in the final consumer's bill, but rather an attempt to clarify what kinds of costs are included.



Often abstraction charges, effluent and treatment charges are taxes or fees, and use and sewerage charges are rather services costs.

All the countries collect charges (services costs, fees or taxes) at all stages of the WSS chain, except Sweden that does not charge water abstraction, perhaps because water is not scarce at all in this country (see the water availability in Table 11-2)³⁰². Although they all collect charges for the provision of the water service, they all have very distinctive financial mechanisms. Charges exist at every step of the process, but not with the same intensity and they are not systematically attributed to the same actor (e.g. the final drinking water consumer). **Charges on industrial effluents and domestic wastewater treatment are less developed than abstraction charges.** In most countries, the drinking water consumer pays most of the water charges (including service costs). However the consumer is not systematically the direct payer. Public money is also involved a lot in the financing of the sector. Direct subsidies intervene in use and sewerage charges in Belgium, Italy and Portugal.

Money collection is fragmented. A way to analyse and compare the financial flows between countries is to start from the concepts of cost-recovery and full-cost-pricing (including environmental and resource costs). A full transparency of price mechanisms in the water sector would be reflected in the final consumer's bill. In case the consumer pays the full cost of the service provision, transparency would require, that he/she receives a single water bill, detailing all the costs related to his/her use: abstraction charges (taking the resource cost into account); use charges paying for the production and distribution service; sewerage charges paying for sewerage; and treatment charges charging the cost of wastewater treatment. In fact, except for use and sewerage charges, water costs are not directly attributed to the drinking water consumer and the drinking water supplier is not alone in collecting the charges. Abstraction and effluent charges are most of the time directly collected by a public authority. In spite of this fragmentation, and involvement of public authorities, most of the money collected is reallocated to the water sector³⁰³. In such a context, it remains difficult to

³⁰² In Table 11-4, Sweden, and in a lesser extent Italy, appear as exceptions as they are not mentioned in every steps of the financial flows. However the fact that we find no abstraction and effluent charges in Sweden and no treatment charges in Italy could be due to difficulties in data collection. For instance, the absence of charges in Sweden and Italy could hide other financing mechanisms, for which we lack data.

³⁰³ However, contrary to the impression that Table 11-4 could give, a profit margin should be subtracted from the reallocation of the collected money in the cases of private capital involved (either as a share of collected money,



precisely determine the service cost to the fragmentation of the payments and financial flows in the water sector.

A dominant design emerges from Table 11-4. In a large majority of countries, abstraction, use and sewerage charges are collected. Effluent and treatment charges are less systematic, but may also represent important financial sources in many countries. At the same time, if one comes back to our three initial questions concerning financial flows, we see that the final drinking water consumer is the main payer, revenues are mainly used for operations and investments, and **money flows from the consumer to the infrastructure through the drinking water supplier.**

either on a negotiated profit margin on the amount of public money invested in the infrastructure, as it is the case for Aquafin in Belgium).



Table 11-4: Financial flows (taxes and bills) in selected European countries

Charges	Who pays?	Who collects?	Use of revenue?
Abstraction charges	DW consumer: B, F, E, NL, D Others: F, E, I, P, E&W	DW supplier: B, NL Public authority: F, E, I, P, D, E&W Others: F	Infrastructure: F, I Resource protection: B, E, NL, D Others: F, P, E&W
Use charges	DW consumer: B, S, NL, I, P, D, E&W Regional and municipal budget: B, I, P	DW supplier: B, S, NL, I, P, D, E&W	Infrastructure: B, S, NL, I, P, D, E&W
Sewerage charges	DW consumer: B, E, S, F, NL, I, P, D, E&W Regional and municipal budget: B, I, P	DW supplier: B, S, I, P, D, E&W Others: B, E, NL, D, F	Infrastructure: B, E, S, NL, I, P, D, F, E&W
Effluent charges (pollution)	DW consumer: NL, D Industries: B, F, E, NL, D, E&W Others: F, E, E&W	DW supplier: D Public authority: B, F, E, NL, D, E&W	Infrastructure: B, F, E, NL Resource protection: E, D, E&W
Treatment charges (wastewater)	DW consumer: B, NL, F, E&W Others: P	DW supplier: B, P Public authority: B, NL, F Others: E&W	Infrastructure: B, NL, P, F, E&W

11.3.3. Policy Outputs

In order to get a proper evaluation of water policies developed in the selected EU countries, one identifies some outputs (administrative products) and final outcomes (induced effects) of these WSS policies. But measuring policy outcomes is notoriously difficult, as these evaluation tools are either not uniform between the countries or not developed at all. Therefore, we focus on strictly measurable outputs, and identify similarities on these outputs.

The effective **protection of the resource** is particularly difficult to assess. It would not really be worth comparing the qualities of raw water in different places, as local conditions are too determining in the figures. As a result, once again, we must limit our analysis to the outputs. Even there, precise figures are not available. For instance, in France, if water abstraction permits are systematically given to water users, it does not inform us about the effectiveness of the measure. Are the maximum levels of abstraction determined according to the available flow of the resource or according to the needs of the users? The answer is often negative. Environmental permits are scarcely revised in case of depletion of the resource. Regarding protection perimeters, the problem lies rather in a slow implementation process. In France, once again, 12,786 protection perimeters have been put in place, but only 35.3% of water catchments are sufficiently protected. Such approximation on data provides problems for the management of the resource. Data are developed for monitoring the (anthropogenic) water cycle, but not for resource management. The monitoring of distribution, sewerage and treatment is more precise, while data is lacking about the implementation of protection measures related to the resource. This gives information on trends that is however not detailed enough to be a guidance tool in the policy process.

The connection to the **distribution** network is widespread (see Table 11-5). Most countries are close to a rate of 100%, except Spain (57.8%, in 1998) and Portugal (90%). Both countries are under remedial processes and benefit from EU subsidies in order to do so. **Leakage** rates are much more dissimilar. A good rate attests of the good maintenance of the network and of a concern of the operator for resource preservation. Only the Netherlands and (Western) Germany have distribution networks in good condition. Other countries have a leakage rate between 20% to 30%. Italy and Portugal face a particularly worrying situation with over 40% of losses in the network.



Apart from water supply, the population is widely connected to **sewers**. Rates of connection are close to 100% everywhere (we include individual treatment), except in Italy (86%). However, all waters collected are far from being **treated** in many countries. While some countries have high rates of connectivity (above 85% for the Netherlands, Sweden, Germany and England & Wales), the problem of direct discharges has not been resolved yet after ten years of implementation of the directive on urban wastewater (European Communities 1991a). Belgium comes last with a connection rate to a (collective) treatment plant of 38.1% (in 1998, estimated to 55% today). Other low connectivity countries as Portugal and Spain, are developing remedial programmes. However, it should not be concluded that countries with a rate under 100%, such as France (76.9%) and Italy (75%), have incomplete wastewater treatment and remedial programmes. In Italy and France, with large rural areas and a very low density of population in some places, individual treatment is common. An important share of tertiary treatment is generally associated to a good rate of connection to treatment plants. However, this rate is remarkably low in England & Wales. The absence of renewal of the infrastructure partly explains this situation.



Table 11-5: Outputs of national policies in the WSS sector

		B	F	E	NL	S	I	P	D	E&W
Distribution	% of pop. connected to DW supply	98	99.2 (1998)	57.8 (1998)	100 (1998)	100	96	90	98,9 (1998)	>99
	Leakages/ overall losses (%)	20	28 (1999)	19.4 (2001)	5	-	39 (average)	40	8	22
	Price range ³⁰⁴	0.75-2.50 (1.99)	1.50-3.00 (2.65)	0.42-1.66 (0.77)	0.82-1.98	1.15	0.15-0.883	-	1.27-2.33 (1.40)	
Sewerage	Population connected to sewers (%)	99.8 (1998)	97.5 (1998)	-	100 (2000)	100 (2000)	86	100 (1998)	100 (1998)	100 (2000)
Treatment	Population connected to a wastewater treatment plant (%) ³⁰⁵	38.1 (1998)	76.9 (1998)	48.3 (1995) (58 in 2000)	98.1 (2000)	86.0 (2000)	75.0 (1995)	46.0 (1998)	91.0 (1998)	94.6 (2000)
	Primary treatment (%)	-	-	10.6	-	-	2.9	17.8	1.1	3.6
	Secondary treatment (%)	22.0	-	34.4	18.1	5.0	36.1	26.0	6.3	64
	Tertiary treatment (%)	16.1	-	3.3	80.0	81.0	24.1	2.3	83.1	27

Source: Eurostat (2003b), except figures in italic for various sources.

³⁰⁴ Price is not an output of the public policy, but it must rather be seen as an outcome or an impact of other public policies on water.³⁰⁵ Independent wastewater treatment is not included.

Price is rather a policy outcome, a consequence of public policies rather than an output voluntary produced by the actors of implementation. Nevertheless we chose to include it in our analysis in order to get an idea of price range differentials between countries³⁰⁶. It is striking to observe that there are certainly more price disparities within each country than between the nine countries of our empirical sample. Lower rates are measured in Spain and Italy with respectively EUR 0.42-1.66 and EUR 0.15-0.89. Belgium, France, Germany and the Netherlands have a similar price range around EUR 0.75-3.00. It is interesting to observe a relative convergence on prices despite huge disparities between countries concerning resource availability, density of population, degree of fragmentation of the sector and the legal and economic structures of the operators. For instance, England & Wales with a unique legal and economic structure has approximately a similar level of pricing as other European countries (EUR 1.40 per cubic meter). It is necessary to remain cautious with these figures that are only a gross approximation of the reality. In most countries, it is extremely difficult or quite impossible to compare price structures and even calculate a national average price.

We were not able to get access to complete, detailed and sound data concerning policy outputs. While rates of connection to distribution, sewerage and treatment are known, we miss information about the cost and price structure of WSS services, as well as about the effectiveness of protection measures on resource renewability. Such lack of information is puzzling (but notorious) as the WSS sector is progressively opening to private involvement (at least formally).

11.4. EMERGING REGULATION IN WATER MANAGEMENT: IMPLEMENTATION ARRANGEMENTS AND PRIVATE PARTICIPATION

Throughout Europe, there exist many legal opportunities to involve private capital in the WSS sector. **Competition for wastewater treatment** is possible in all the countries under scrutiny, except in Portugal. This situation contrasts with the low involvement of private actors, as observed in the organisation of the sector (see Figure 11-1).

³⁰⁶ For more detailed results, see www.ecologic.de where a study on the comparison of European drinking water prices is available.



If opportunities for competition are widespread, the modalities of tendering and contracting are not necessarily similar. In fact, we observe important divergences in contracts. The mechanisms for competition are different from one country to another. **Competition is mostly occurring in the format of competition FOR the market.** We observe little possibility for competition IN the market. However, there is competition in the market for water supply to large industries in the UK, the Netherlands, as well as in Germany. Furthermore, actual competition is sometimes restricted, when the possibility of direct assignation remains possible in Italy or when a very select number of competitors present bids (such as in France). The **length of certain contracts** is also a barrier for true competition. The length of contracts is rather long, as they have a duration of over 20 years, except for Sweden. In Belgium (Flanders), for wastewater treatment, the contract had not initially been subject to a public tender, and it was not limited in time, with a lease termination of 20 years when a party denounced the contract. In Spain, the contract can be effective for 50 years when the operator commits itself to invest in the infrastructure. Contracting can also occur without liberalisation or privatisation. When the existence of a contract is mentioned (see Table 11-6) while there is no competition, this means that public companies signed a “management contract” with the public authorities (as it is the case of the production and distribution sub-sectors in Belgium).



Table 11-6: Liberalisation practices

Competition in:		B	F	E	NL	S	I	P
Production	Yes/No	No	No	No	No	Yes	Yes	No
	If yes: for/in, contract or not, duration	25y. contract (W)	20 y max.	-	-	3-5y	For the market Competitive bid but also direct assignation	-
Distribution	Yes/No	No	Yes	Yes	Yes	Yes	Yes	Yes
	If yes: for/in, contract or not, duration	5y. contract (W)	For the market (but in practice few competitors) 20y contract max. (average 11y)	For the market 25y max. Up to 50y if commitment to build infrastruct.	No	3-5y	For the market Competitive bid but also direct assignation	For the market Competitive bid (20-30y concession)
	If yes: regulation	-	Laws but no regulatory body	Legal void for obligations regarding operators	Benchmarking	At municipal level	National and ATOs levels Price regulation	National regulator (recommendations)
Sewerage	Yes/No	No	Yes	Yes	Yes	Yes	Yes	Yes
	If yes: for/in, contract or not, duration	-	For sewer maintenance 20y	For sewer maintenance	No	3-5y	For the market Competitive bid but also direct assignation	For the market Competitive bid (20-30y concession)
	If yes: regulation	-	Laws, but no regulatory body	-	Benchmarking	At municipal level	National and ATOs levels Price regulation	National regulator (recommendations)
Treatment	Yes/No	Yes	Yes	Yes	Yes	Yes	Yes	No
	If yes: for/in, contract or not, duration	For the market (FL) Unlimited with lease termination of 20y.	15-20y contract	For the market 25y max. Up to 50y if commitment to build infrastruct.	No	3-5y	For the market Competitive bid but also direct assignation	-
	If yes: regulation	-	Laws but no regulatory body	No laws like in France	Benchmarking	At municipal level	National and ATOs levels Price regulation	-

A systematic **regulation of practice** by an independent regulatory agency is absent in most places. Except in England & Wales, the regulation of private operators remains limited. The absence of a regulatory agency, that can take legally-binding decisions, is particularly striking. In Portugal, the national regulator can only formulate recommendations (as well as the to be installed regulator in Flanders (Belgium)). In France, there is a form of regulation by the law, but no regulation authority exists to monitor its enforcement. In Spain, there is even a legal void for obligations regarding operators. In the Netherlands and Sweden, regulation is conducted by means of control at municipal and regional level control and some benchmarking activities. In contrast, Italy organises regulation at national and ATOs levels, notably on price.

It is still too early to evaluate the efficiency of the introduction of competition in the WSS sector. Liberalisation processes are too recent in many countries to be properly assessed. Moreover, the level of activity submitted to liberalisation is in some countries too residual to justify the setting of a complete administrative arrangement or independent agency for regulation.

11.5. CONCLUSION

In the comparative policy analysis that we conducted about the regulation of the WSS sector in nine EU countries, we particularly insisted on the similarities between countries, as well as pointing out the main differences. In the following table (see Table 11-7), we isolate the most striking points of similarities and differences. The major differences separating the countries are the availability of the resource and, in southern Europe, the tough competition between agriculture and drinking water supply for the abstraction of the resource. Social objectives really differ, and are even absent in some countries. Economic instruments fit more to national traditions of public finances and public intervention, as well as the conditions of private involvement in the sector. Also, the level of wastewater treatment widely differs from one country to another, but should progressively converge.

In contrast, the number of similarities between the different cases is impressive, given the initial situation (including the heterogeneity between the countries and the differences in size and population) and water availability in the different countries. Drinking water consumption



per inhabitant is similar. The pressure on the resource is mainly due to diffuse pollution by agriculture, and discharges of hazardous substances by industry in a smaller extent. In the conduct of policies we observe equivalence on economic and environmental objectives as well as on prescriptive instruments in all the sub-sectors. In the organisation of the WSS sector, the public and municipal organisation dominates, even if we notice an (at least legal/formal) opening of the sector to competition for the market, however limited. The needed financial resources are paid by the drinking water consumers, collected by the drinking water supplier, and mainly affected to the water infrastructure. Finally, rates of connection to drinking water supply, as well as to sewerage, are close to 100% everywhere.

Table 11-7: Summary of the similarities and differences in water policy in selected EU countries

Similarities on:	Differences on:	Refers to part:
DW demand per inhabitant	Availability of the water resource as well as the volume of water abstraction	11.2.1
Pollution of drinking water reserves by agriculture Concentration of hazardous substances	Over-abstraction by agriculture Much local/regional rivalries	Erreur ! Source du renvoi introuvable.
Environmental and economic objectives	Social objectives	11.3.1.1
Prescriptive instruments (e.g. quality standards for drinking water, abstraction and discharge permits)	Economic/incentive instruments (Taxes/ charges/ subsidies)	11.3.1.2
Dominance of municipal and public operators	Experiences of involvement of private capital	11.3.2.1
Pre-eminent financial mechanism: from the DW consumer to the water infrastructure, with a collection by the DW supplier	Levels of direct subsidies	11.3.2.2
Rate of connection to DW supply and sewerage	Rate of connection to a treatment plant	11.3.3
Partial opening to competition for the market (but, in result still very different)	Regulation and terms of the contracts allowing involvement of private capital	11.4

The factors explaining these similarities and differences are manifold. However, some constraints are particularly powerful to force harmonisation. The first are the EU

requirements. Since the late 1970s, EU environmental policy, in particular in the water sector, is imposing certain sets of instruments and monitoring programmes. In this long tradition, the WFD turn up as a powerful tool not so much to harmonise instruments, but rather to harmonise the policy objectives.

The evolution towards harmonisation is also due to **economic/financial developments**. Adaptation to EU law requires substantial investments, which in the context of cuts in public finances of the early 1990s, pushed the public sector in the direction of alternative financing mechanisms. The present private involvement in the water sector is certainly partly due to economic reasons, but not only because of that.

The third factor explaining the convergences and divergences are the **technological developments**. The rising pollution problems, combined with an increase in quality standards for drinking water and discharges, required the recourse to high technology equipments. Traditional (mainly local and public) operators did not manage such technologies. As a result, public authorities called for the expertise of the major (private) companies of the sector that were able to provide the necessary technology and related services.

It makes no doubt that these developments pressed for change and provoked in some way an harmonisation of the water policies conducted in the countries.

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