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## Part I: The Belgian Context of water management

### I.1. Administrative-political structure of Belgium: towards a Federal State

Belgium is usually described in the political literature as a paradigmatic example of consensual (power-sharing) democracy<sup>1</sup>. Belgian society is divided along three lines of cleavages, initially religious and later socio-economic and linguistic, that structure both political parties (three-party system enlarging in the 1960s to regionalist parties<sup>2</sup>) and pillar organisations. The country has a parliamentary polity. The proportional representation was introduced in 1899. The linguistic cleavage, in particular, coupled with a shift in the economic dominance from Wallonia to Flanders, led to major institutional transformations that partially explain the current divergence in regional institutional water regimes.

The Belgian State is a recent State, even more so in its current federal setting. Belgium emerges in 1830 as an independent parliamentary monarchy. Whilst a unitary State since its creation, it 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)<sup>3</sup>. 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 exceptions<sup>4</sup>.

Belgium is a founding member of the European Union. Its strong commitment in favour of the EU, based on a broad national consensus, has never been put into question. In the field of environment, the position of Belgium in the EU decision-making process is often the one of a 'laggard' State<sup>5</sup>. Many delays in the transposition and implementation of the European water directives are recorded, mainly due to the country's federalisation process. The successive condemnations of the European Court of Justice accelerated the transformations of the water regimes.

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<sup>1</sup> Lijphart A., 1999, *Patterns of Democracy*, New Haven, London, Yale University Press, p. 33.

<sup>2</sup> « *The electoral success of the federalist parties in the 1960s and 1970s provoked the division of the three traditional parties: the Christian Democrats in 1968, the Liberals in 1971, and the Socialists in 1978* ». De Winter L., Dumont P., 1999, « Belgium: Party System(s) on the Eve of Disintegration? », in Broughton D., Donovan M., *Changing Party Systems in Western Europe*, London, New York, Pinter, p. 198.

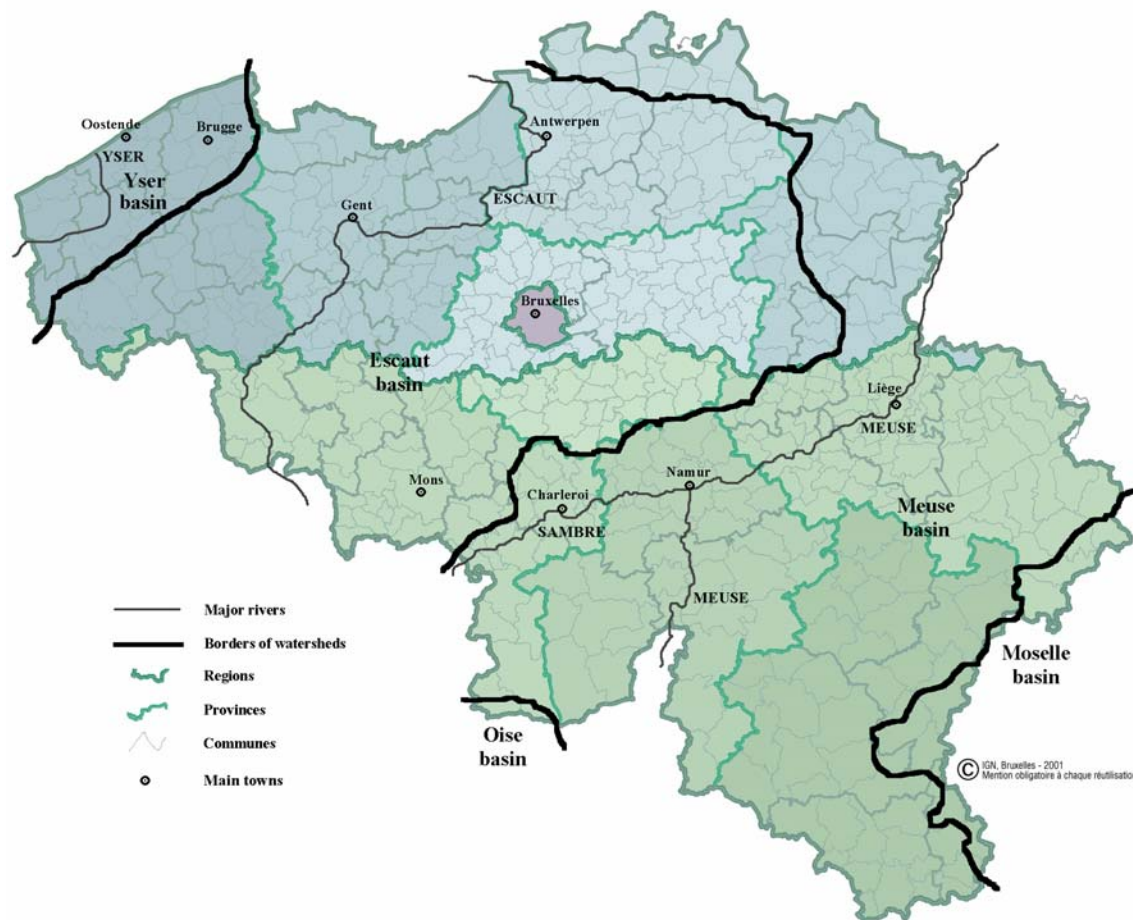
<sup>3</sup> The provinces and the communes have been put in place since 1830.

<sup>4</sup> The Federal State is still competent for matters such as the determination of norms of radioactivity in the water.

<sup>5</sup> Sbragia A., 1996, « Environmental policy: the 'push-pull' of policy-making », in Wallace H. & Wallace W. (eds.), *Policy-making in the EU*, 3rd ed., Oxford, Oxford University Press, p. 238.

## I.2. Water resources and uses: regional disparities and rivalries

Map 1: Approximate drawing of watersheds in Belgium



Sources: Backdrop from IGN, Barraqué (1995), Institut wallon.

Belgium's water resource is distributed among five river basins. The two main ones belong to two international rivers, the Meuse and the Escaut, that take their source in France, cross both Flanders and Wallonia and flow into the sea in the Netherlands. Between those two, numerous canals form an important network for navigation. The major aquifers are located in Wallonia. The carboniferous limestones of the Condroz Plateau constitute the main aquifer (132 Mio m<sup>3</sup> of groundwater withdrawn in 1992), followed by the aquifers of Mons (46 Mio m<sup>3</sup>) and the Tournaisis (28 Mio m<sup>3</sup>).

Even though some fear of water shortages appeared in the 1960s, Belgium does not face an "hydrous stress"<sup>6</sup>, despite its high density of population (333 inhabitants/km<sup>2</sup>). Water availability is around 12,000 Mio m<sup>3</sup>/year, brought mainly by rainfalls, or 1,900 m<sup>3</sup>/capita/year<sup>7</sup>. A considerable amount of water also comes from France, brought by the

<sup>6</sup> Some international reports stated it at the beginning of the 1990s, e.g. Gleick P. (ed.), *Water in Crisis: A Guide to the World's Freshwater Resources*, Oxford, Oxford University Press, cited in Cornut P., 2000, *La circulation de l'eau potable en Belgique et à Bruxelles*, unpublished, p. 48.

<sup>7</sup> The situation of « hydrous stress » is set under 1,500 m<sup>3</sup>/capita/year, in Barraqué B. (ed.), 1995, *Les politiques de l'eau en Europe*, Paris, La Découverte, p. 5.

rivers Meuse and Escaut (5 Mio m<sup>3</sup>/year)<sup>8</sup>. The yield (renewable resource) of groundwater is around 900 Mio m<sup>3</sup> for the whole country, exploited at a rate of 75%.

This picture should not hide strong regional disparities, with the North dependent from the South. Wallonia satisfies 55% of the national needs in drinking water when it counts only 37% of the population<sup>9</sup>. Flanders and Brussels are not self-sufficient. The situation implies transfers of water and generates strong rivalries. It is complicated with the strong dependence of the Netherlands on the water of the Meuse for its drinking water production. The rivers Escaut and Meuse are managed by international authorities: the International commissions for the protection of the Meuse and the Escaut, settled by the treaties of Charleville-Mézières of 26 April 1994, signed between France, The Netherlands, Belgium, the Flemish Region and the Walloon Region.

Water demand for anthropocentric uses<sup>10</sup> is quite high. From the “pumped” water, a quantity of 90% is directly used by private users and the remaining part is distributed to other users (citizens, other industries, etc.) by public utilities. The main direct user is industry with 89% out of 100% of the pumped water (thus there is only 1% more for other direct users), mainly for cooling (67%), but also in the industrial process. Water is withdrawn exclusively from surface water for cooling and both from surface and groundwater for the industrial process itself, that sometimes requires water of high quality. Production of mineral water is particular as it exclusively needs water of high quality. Only present in the Walloon Region, this sector relies only on groundwater (8 Mio m<sup>3</sup> withdrawn per year).

The second use is drinking water production. The sector withdraws 720 Mio m<sup>3</sup> per year (10% of the total withdrawals), 64% produced from groundwater, often distributed without prior treatment, and 36% from surface water, more expensive to produce. This production, which equally faces strong quality requirements, is vital for the final users. It is assured by public companies and distributed to various final users (households, farmers and industry). Regional disparities in the distribution of the water resource, particularly groundwater, make drinking water strategic. Flanders and Brussels are dependent of a production in Wallonia for the provision of drinking water, respectively at a level of 40% and 98%.

If we look at *in situ* anthropogenic uses, requirements in quantity and quality are much more difficult to present. First, activities of drainage, even if they are not quantified, are of great importance in such a rainy country that also has some land under the sea level (*polders*). Second, the function of purification (self-purification) played by the rivers is crucial as the country is densely populated and highly industrialised. The use concerns mainly surface water, but also groundwater if one considers diffuse pollution and loosing wells (*puits perdants*). The state of purification in Belgium is low. In 1995, the connection of households to a purification plant was of 35% in Flanders, 21% in Wallonia and 0% in Brussels<sup>11</sup>. The situation is evolving fast under European pressures. Third, navigation is of crucial importance for a country that is inserted in a regional network of canals (Belgium, The Netherlands,

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<sup>8</sup> OCDE, 1998, *Environmental Performance Review*, p. 33.

<sup>9</sup> Barraqué B. (ed.), 1995, *op. cit.*, p. 54.

<sup>10</sup> By anthropocentric uses we mean the water uses that satisfy direct human needs, as opposed to natural uses, i.e. the water uses made by the living environment for nutrition or reproduction. We distinguish the anthropogenic water cycle from the natural water cycle. The last is the cycle of water in the geosphere (evaporation, rain, percolation, circulation of groundwater and water flow), while the former corresponds to the water cycle that satisfies human needs (withdrawal, primary treatment, water supply, consumption, sewage, purification and discharge).

<sup>11</sup> OCDE, 1998, *op. cit.*, p. 84.

Germany, France). With Antwerp and Liège, Belgium has two main ports (respectively 70.1 Mio t and 12.5 Mio t of inland navigation freight in 2000) connected to the rest of Europe with 1,500 km of waterways. Finally, flood control is the last main water use, even if this use is indirect and its proportion in requirements determined according to the water needs of the previous purposes.

*Table 1: Water withdrawals in Belgium, 1998 (estimates, in Mio m<sup>3</sup>)*

Production	Consuming	Water		Total	Relative part (%)
		Groundwater	Surface water		
Public utilities	Drinking water production	462	258	<b>720</b>	<b>10%</b>
Private companies	Mineral water production	8	0	8	0%
	Cooling	0	4688	4688	67%
	Process	148	1400	1548	22%
Agriculture		10	0	10	0%
Private domestic withdrawals <sup>12</sup>		0	0	0	0%
<b>Total</b>		<b>628</b>	<b>6346</b>	<b>6974</b>	<b>100%</b>

Source: OCDE, 1998 ; Belgaqua, 1998 ; DGRNE, 1995.

From the analysis of the hydrological dimension and related anthropogenic water uses, we have identified two main lines of rivalries that persist over time. The first is set between the important pollution of water, both surface and groundwater, and the need to produce drinking water. Pollution is due to a low purification of domestic and industrial wastewater prior to discharge in rivers. It is also due to diffuse pollution, especially with manure spreading. In such conditions, drinking water production from groundwater tends to be more difficult, with the growing necessity to build expensive pre-treatment plants. The second line of rivalry comes from the tension between, on the one hand, public works and private infrastructure that are necessary for the development of economic activities (land-use planning, agriculture, flood control and navigation) and, on the other hand, protection of the environment and biodiversity. Changes in water regimes over the period studied here (1804-2001) are made according to these two lines of rivalry between the various water users, being oriented towards more exploitation or more protection of the water resource.

## Part II. Property rights on water

The tensions referred to earlier could not be managed without a clear delimitation of the property rights between users<sup>13</sup>. The regulative system surrounding water uses was set in the Civil Code of 1804. Far from making a clean sweep of the past, the Civil Code codifies wide legal concepts that mainly date back to the Roman Period and the Middle Age but are adapted to the principle of individual private property. It sets up rules of the game that are later clarified by public laws and regulations. These successive clarifications give the rhythm of the evolution of the regulative system until today. This evolution is there analytically cut in four phases. Based upon the Civil Code, the law develops first in favour of production uses, mainly agricultural, before focusing on public health at the turn of the century and opening itself to resource protection and secondary uses.

<sup>12</sup> Some values corresponding to zero are due to a lack of data. For instance, undeclared private wells are of common occurrence in Wallonia. In any case these values are below 1%.

<sup>13</sup> This part of the chapter is based on an initial legal analysis made by de Sadeleer N. and Gerken I., 2000, *Water resources' appropriation in Belgium in the course of the XXth century*, Brussels, CEDRE, 50 pp., unpublished.

## II.1. Diachronic evolution of the property rights

The Civil Code defines the property rights and determines who is the formal owner and what are its related use and disposition rights<sup>14</sup>. Concerning water, it does not adopt a resource approach<sup>15</sup> but tends to link the issue of water property with the one of land property (as far as water is considered as a fixed good). The status of running water is more ambiguous. According to the principle of access<sup>16</sup>, rainwater, ponds, groundwater and springs<sup>17</sup> are private water, if they are appropriated by the landowner, e.g. when rainwater falls on a land, when groundwater is located under the land and when springs rise on the land. Access to the resource is restricted to the landowner. Because water flows at the surface, it is considered as running water that cannot be owned individually<sup>18</sup>. In fact, within the running waters a distinction is made between navigable rivers and non-navigable rivers. Navigable rivers (NR), including canals and lakes, are parts of the public domain (public property). The State cannot sell formal ownership rights of the public domain or parts of it, but it may grant concessions. Non-navigable rivers (NNR) are at the disposal of riparian landowners who can withdraw water and even use the entire flow as far as they restore it at the end of their property. Thus, as long as water does not reach navigable rivers, private ownership clearly dominates. Riparian landowners own the resource and are consequently in charge of its management.

It is obvious that the absoluteness of this organisation of rights would hamper water uses by non-owners, for which water is vital. The Civil Code actually limits private property on water by means of easements (*servitudes*)<sup>19</sup>. Easements are introduced for the public interest or the interest of individuals, e.g. the landowner is not allowed to deviate the stream of its spring if it supplies other inhabitants with water. Downstream lands must receive the natural water coming from upstream lands. In general, easements give use rights on water to users that do not have formal ownership rights on the resource. It is the case with the obligation to riparian landowners to let free access (*libre-accès*), free course (*libre-cours*) and freedom of towpath (*servitude de halage*) to navigable rivers. The easements clearly limit disposition and use rights of the formal owners of the resource. Some use rights are precisely defined by the Civil Code, e.g. the rights of withdrawing water, fishing, hunting and irrigating granted to the riparian landowners of non-navigable rivers. Even if the Civil Code defines property rights on the water resource, public law must bring some clarification.

During the first phase of legal development (1804-1846), the first measures concerning water are enacted at the benefit of agriculture. A law of 1807 on the drying up of swamps grants the right to the Central State to expropriate and suppress buildings along navigable rivers for the opening of new navigable waterways or the drying up of swamps. It confirms the State as the central actor of the period. The Central State is the owner of the public domain and has a power of regulation on running waters. Furthermore, it guarantees riparian landowners'

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<sup>14</sup> Art. 544 CC: « *La propriété est le droit de jouir et de disposer des choses de la manière la plus absolue, pourvu qu'on n'en fasse pas un usage prohibé par les lois ou par les règlements* ».

<sup>15</sup> With a resource approach, we consider the resource as a single whole. Water intended as a resource encompasses rainwater, all surface water and groundwater. It also relates quantity and quality aspects and brings every anthropocentric and natural uses into the same approach. The resource approach is opposed to sector-based approaches and clear-cut legal definitions.

<sup>16</sup> Art. 552 CC: « *La propriété du sol emporte la propriété du dessus et du dessous* ».

<sup>17</sup> Art. 641 CC: « *Celui qui a une source dans son fonds peut en user à sa volonté, sauf le droit que le propriétaire du fonds inférieur pourrait avoir acquis par titre ou par prescription* ».

<sup>18</sup> Art. 714 CC: « *Il est des choses qui n'appartiennent à personne et dont l'usage est commun à tous. Des lois de police règlent la manière d'en jouir* ». The Roman right speaks about *res communes*.

<sup>19</sup> Art. 637: « *Une servitude est une charge imposée sur un héritage pour l'usage et l'utilité d'un héritage appartenant à un autre propriétaire* ».



property rights. The latter, (who constitute the second category of leading actors) are granted formal ownership rights on springs and groundwater and large disposition and use rights on non-navigable rivers. Disposition rights can also be at the benefit of the holder of a concession given by the Central State on navigable rivers. Boatmen also have a use right. We observe however that, throughout the first period, the scope of regulated goods and services is limited to consumption, production and protection.

In the second phase (1846-1945), many legal dispositions confirm and precise the legal arrangements of the Civil Code. The disposition rights that riparian landowners have on water are progressively limited by the law, in favour of the development of agriculture. Laws on irrigation (1848) and drainage (1851) establish new easements, setting a right of free way on intermediary lands to water owned at purpose of irrigation (*servitude d'aqueduc*) and consequently a right of free way for this flow of water on lower lands (*servitude légale d'écoulement*). Such a disposition that eases the drainage of fields is determinant in the growth of returns in agriculture. The tendency to favour the drainage of fields is confirmed by the law of 1877 on the regulation of non-navigable rivers that charges riparian landowners with the cleaning out (*curage*) of the rivers bordering their land. The young Belgian State also reforms the statutes of the *polders* and *wateringues* in 1846-47. *Polders* and *wateringues* are forms of associations (of common interest) between farmers, i.e. riparian landowners, interested in works of irrigation and flood control.<sup>20</sup> They build and maintain drainage systems, manage the non-navigable rivers and levy taxes on their territory to finance the works that they execute. All the preceding regulations are aggregated in the Rural Code of 1886. The regulative system now involves more water uses than those only related to agriculture. The law protects the springs dedicated to mineral water production and water cures in Spa since 1889, dispositions extended to all mineral water springs in 1924. So the arena of actors is extending to farmers, recognised as a specific group of owners, industrials and fishers. The purpose of property right changes is drainage, while first concerns with absorption and industrial production appear. Nevertheless, the Central State and the private riparian landowners remain the leading actors over the period. The last are even confirmed in their rights by the *Cour de Cassation* (Belgian Supreme Court of Appeal) in 1883: if their ownership rights have to be limited by administrative measures, they must receive an indemnity, except in cases of interest for public health or agriculture. The configuration of the regulative system changes after the Second World War, in parallel with the development of the Welfare State.

Disposition rights are still limited in the third phase (1945-1980), but this time the aim is different, as the preservation of public health and safety are now looked after. Attempts at resolving problems such as absorption (evacuation of wastewater) and floods appear in legal texts. The laws of 1950 and 1967 about the regulation of non-navigable rivers reform the law of 1877. They exempt the riparian landowners of assuring the cleaning out of rivers at the benefit of the State and facilitate the conduct of public works establishing the presumption that riverbeds belong to the administrative authority managing the river (Central State, province or commune)<sup>21</sup>. Public authorities assume the necessity of allowing water to flow to

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<sup>20</sup> *Polders* are located only along tidal rivers, in specific areas (i.e. along the Escaut), often under the sea level, while *wateringues* are the same kind of organisations located out of polder zones, e.g. along smaller rivers such as the Dender. *Polders* and *wateringues* are qualified of common properties, as defined by Elinor Ostrom (*Governing the Commons*, Cambridge, Cambridge University Press, 1990). In fact their autonomy from the State is declining during the period.

<sup>21</sup> Non-navigable rivers are classified in four categories since 1950 that correspond to the superficies of the hydrographic basin they cover: first, second, third and unclassified. The NNR of first category are managed by

the sea as quickly as possible. The growing assertion of the State in the management of water through property rights is confirmed with the dispossession in 1956-57 of the competence of *polders* and *wateringues* in the maintenance of dikes and the management of rivers, following a water disaster. The Central State is then more and more committed to the execution of cleaning out and works in order to fulfil its mission in the field of public health, but also to answer the claims of farmers desperate with chronic floods. Notice also that the range of actors concerned in property rights is not modified at the beginning the regionalisation.

Since 1980 (fourth phase), competencies in the field of the environment, water quantity and quality management is progressively transferred to the Regions. The regulative system in the three regions evolves in different ways. In Flanders, the focus is put on the control of formal ownership rights. Expropriation has been understood as an effective regulation tool. Since 1996, the Flemish Region can expropriate riparian landowners either for the management of dams and dikes or for complementary ecotechnical works or recreation projects on riverbanks. Also, expropriation can be conducted to set up the natural reserves foreseen in environmental protection plans. In Wallonia, the focus is on the regulation of use rights. The Walloon Code of Urban Planning (CWATUP) prohibits the establishment of holiday villages or residential houses due to the danger of floods by setting up zones of natural foreseeable risk. Other pieces of legislation also prohibit landowners to damage the riverbeds and to disturb or destroy fauna and flora in protected wetland areas. The question of expropriation is not considered except in the case of the protection of wells (1990). In the Region of Brussels-Capital, which is a wide urban area autonomous since 1989, expropriation is used as a tool in order to set up nature corridors, following the Flemish system. The Region has appropriated the fishing right and set the procedure to deliver fishing licenses. As a summary, we see that on the one hand, Flanders and Brussels are entitled to expropriate with an aim of nature protection or public safety (although Brussels follows a similar logic, it does not go as far as Flanders), and on the other hand, Wallonia is more keen on regulating use rights. While the range of actors remains constant as compared with the previous periods in the three regions, uses such as water consumption, living environment and recreational activities are more taken into consideration.

## **II.2. A strong and complex property right structure**

The global organisation of property rights on water set in the Civil Code is still in place today, as it is the case for the private ownership of springs or the public domain on navigable rivers. However since the beginning of the nineteenth century major changes occurred in the regulative system. These changes are motivated by different purposes: a stimulation of the development of agriculture (phases 1 & 2), a better protection of public health and safety (phase 3) and at last a better protection of nature and of potential drinking water (phase 4). In fact, changes intervene more in order to allow the development of sectorial activities than in order to conduct a true water resource management. Interventions focus more on the exploitation of water, even the exploitation of potential drinking water, than on its protection. Inter-sectorial co-ordination between property rights on water and on other sectors is high, unfortunately at the detriment of water protection.

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the Central State, of second category by the province and of third category by the municipality. Upstream parts of rivers with a basin smaller than 100 ha are unclassified and managed by the landowners.

Table 2: Overview of the changes in the regulative system over the period (1804 to 2001)

		Modifications in the regulative system*		
		Formal ownership rights	Disposition rights	Use rights
1. 1804-1846: Codification of wide legal concepts		XXX	XX	X
2. 1846-1945: Limitations in property rights to favour the development of agriculture		X	XXX	X
3. 1945-1980: Limitations in property rights at the benefit of public health		X	XX	
4a. 1980- : Regionalisation of property rights	Flanders	XX	X	
	Wallonia	X	X	XX
	Brussels-Capital	X		X

\* The number of 'X' indicates the relative importance of changes occurred during the phase

Throughout the different phases the legislator intervenes at various levels of the property right system (formal ownership rights, disposition rights and user rights). Changes in the formal ownership right structure is more pregnant in the first half of the nineteenth century, as a consequence of the diffusion of the ideas of the French Revolution and the legal transposition of individualism in private ownership<sup>22</sup>. A new architecture is put in place. Afterwards, easements that promote the development of agriculture and later the preservation of public health modify the disposition rights. Since 1980, changes in property rights reflect different political choices in regions. Flanders organises expropriation procedures and Wallonia rather regulates use rights. Until now, the access to water for non-owners is not broaden and remains very limited.

Except in the case of Wallonia in the last twenty years, we observe a top down approach in the regulative system (see table 2). Water uses are regulated more with formal ownership and disposition rights than with use rights. The use rights given to formal owners are specified by the Civil Code and tend to remain constant, even if less strategic. Disposition and use rights are redistributed over time at the benefit of more particular uses (or to reduce rivalries), i.e. drainage, protection of wells, protection against flooding, recreation and nature. Actually regulation of the water uses by non-owners is more considered by the public policies than by the property right system.

The current property right structure (see table 3) is the result of a piling-up of legal dispositions. Former laws are rarely abrogated<sup>23</sup>. Agricultural dispositions of 1848 about easement on water flows remain active, the same goes for measures of cleaning out (*curage*) designed in 1967 or for conservation of dikes. As a result, the regulative system is growing in scope and complexity. This sedimentation however never questioned the legal order edicted in 1804 in the Civil Code. With a perspective of water protection, such a continuity is detrimental in some cases, for instance in the case of aquifers. The legislator of the nineteenth century had no idea neither about the free circulation of groundwater nor its constitution in fragile aquifers, when it gave absolute rights on it to landowners (according to the accession principle).

<sup>22</sup> Bernard A., 2000, « Le droit comme contenu. Une politique publique de la propriété privée ? », in Renard D. et al., *L'analyse des politiques publiques aux prises avec le droit*, chap. 3, Paris, LGDJ, droit et société. The author refers mainly to Polanyi K., 1944, *The Great Transformation*, New York, Toronto, Farrar & Rinehart.

<sup>23</sup> A heritage according to Rose R., Davies P. L., 1994, *Inheritance in Public Policy. Change without Choice in Britain*, New Haven, Yale University Press.

Table 3: Summary of the structure of ownership of water bodies in Belgium

	Surface water	Springs	Groundwater
Type of rights	Private/public law	Private/public law	Private/public law
<b>Formal ownership rights</b>	<p><b>Running water is public</b>  <u>Navigable rivers</u>: State property (public domain) (the Regions since 1980) (art. 538 CC). The banks belong to the riparian landowners (private).  <u>Non-navigable rivers</u>: presumption of public property for the riverbed and private property for the banks (related to land ownership)                      Exception for NNR of 2nd cat. and al. inside the <i>polders</i> and <i>wateringues</i> (common property)  <u>Ponds and wetlands</u>: private property</p>	Private. Related to land ownership (principle of access)	Related to land ownership (principle of access, art. 552 CC)
<b>Disposition rights</b>	<p><u>Navigable rivers</u>: the State gives concessions or administrative authorisations  <u>Non-navigable rivers</u>: owned by the riparian landowners  <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
<b>Use rights</b>	<p>The State owns the fishing rights (permission system)  <u>Navigable rivers</u>: depends on the disposition rights of the State  <u>Non-navigable rivers</u>: All other uses owned by the riparian landowners for non-navigable rivers.  <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)

The growing complexity of the regulative system does not lead to a weakening of its co-ordination. On one hand, the persistence of a high co-ordination is due to the formal logic of the Civil Code. The ‘legal order’ set by the Civil Code has always been used as a base to reforms of the regulative system. On the other hand, high co-ordination is triggered by the growing intervention of the State in water management. The State often substitutes public intervention to private duties linked with ownership, as in the case of the cleaning out of non-navigable rivers or the management of dikes. However, the legal arrangement of the Civil Code, that brings co-ordination to the regulative system, is by no means adapted to the logic of a resource perspective managed at a river basin scale. The frame was created at a time when water uses were rather limited and water was not perceived as a resource. With the current legal order, the river basin is cut in pieces, i.e. the different categories of water and inside them the limited territories of land property<sup>24</sup>.

### Part III. Public policies on water

The examination of the regulative system reveals that use rights on the water resource are not precisely defined and that the question of non-owners is not considered. So far responding to punctual challenges (problem-solving approach), the public authorities are progressively inclined to regulate the behaviour of all water users, owners and non-owners. Hence, an increasingly complex set of legal dispositions, that tend to cover a broader range of water uses, is installed. The following analysis of the Belgian water policies from the first legal intervention in 1846 allows for a better understanding on the motives and the manners of public interventions in the field of water and on the rivalries that it generates. Protection of watercourses against pollution and quality improvement of drinking water are the main policy

<sup>24</sup> The property right system does not consider the notion of water cycle, except for some dependent uses that were regulated with easements. A partial conception of the water cycle (limited to surface water) appears with the introduction of easements as a consequence of interrelations created by the flow of water. For instance, the formal ownership right on a spring is limited when the spring provides drinking water to a village (art. 643 CC).

problems over the period. Although the problem perception evolves over time, policy responses are more often designed with the perspective of exploiting the resource than protecting it.

### III.1 Diachronic evolution of public policies

(1) The first public interventions concerning the water resource date back to the second half of the nineteenth century (1846-1893). They derive from the necessity to develop the economy and to fight against the most important diseases (the last epidemic of cholera occurs in 1866). Concerning the economic development, the law on *wateringues* (1847) stimulates agriculture. It improves an existing institutional setting aiming at organising collective drainage systems. Consecutively, riparian landowners are compelled to clean out waterbeds in order to accelerate the flow of drained water. In the same period mineral water production falls under protection with a restriction of individual pumpings and the setting of a perimeter of protection around the sources of Spa (1889). Water is only considered as a resource to exploit. Concerning diseases, general measures of police are targeting industries and farmers. On the one hand, a disposition of 1865 prohibits discharges of hazardous substances such as mineral residues and heavy metals from the mining industry. On the other hand the Rural Code (1886) prevents people against throwing dead animals in water as any other substance likely to kill fishes.

According to us, the intervention hypothesis amounts to this: *If we prohibit the most hazardous discharges in watercourses, then we will avoid important diseases*. This policy assumption is partial<sup>25</sup> and is not translated into a coherent institutional arrangement. The minister of Public Works is the single actor involved at the Central State level. Provinces and communes apply the general regulations of police. We cannot speak about a water policy. One particular problem is treated at one particular moment.

(2) Since 1893 the change is induced by the official perception of major river pollution problems and weaknesses in the public health. A nation-wide enquiry about water supply is published in 1902. The government reports, called the André's reports<sup>26</sup>, 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 communes are the main target groups of the resulting legislation. They are the responsible authorities for the public sanitation, according to the laws of 1789 and 1790 and, by extension, for water distribution and sewing. Only the main cities, i.e. Brussels, Gent and Antwerp, have had the financial means to develop distribution networks at that time. This time, the aim of the public intervention is to organise a good water supply in all parts of the territory. In that way, 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 associations, the *intercommunales*, and attributes subsidies. In complement, a national water distribution company, the *Société nationale de Distribution d'Eau* (SNDE) is created in 1913. Its missions are to build and manage the installations where municipalities are not able to do it on their own. With the same aim to improve public health, the State regulates the sales of water. A law

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<sup>25</sup> A consideration of the policy design as a partial design (with sectoral interventions on the resource) is given when all the existing uses at a given period are not taken into account by it. Our interpretation of the past legislation refers to a grid of policy analysis. The partiality of the design is considered with a contemporary perspective. In true historical terms, one should have to consider more for each period the alternatives in policy making, i.e. what was feasible considering the existing knowledge.

<sup>26</sup> André J. B., 1902 & 1906, *Enquête sur les eaux alimentaires*, Bruxelles, ministère de l'Agriculture.

of 1933 sets control measures for the quality of water products. Mineral water springs are now labelled and controlled.

During the period, the causal hypothesis which underlies the public intervention is modified and develops towards a more specific aim: *If we develop public water distribution and regulate the sale of water products, then we will improve public health.* The institutional arrangement necessary for the implementation of the legislation is extended to more public actors than in the former period, e.g. the Ministers of Public Works, Agriculture and Internal Affairs, the *intercommunales* and the SNDE. Regarding the whole water resource, however, the policy design is weak and the aim, i.e. the improvement of public health, is partial. The resource is not protected but exploited and the design suggests that other uses, such as irrigation, industrial production or recreation, could enter in conflict with the dominant use, i.e. consumption.

(3) After the Second World War, the building of distribution networks is not yet finished<sup>27</sup>. 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)<sup>28</sup> and frequent floods are observed. Legal dispositions targeting industries, communes and riparian landowners are enacted with the aims first to reduce the pressure on surface water due to the development of industry and second to accelerate the drainage of fields and the evacuation of wastewater. 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 that complete sector-based limitations for hazardous substances. Communes are charged to realise programs of purification. At the same time, public authorities take over the responsibility of cleaning out rivers, discharging riparian landowners from their duty.

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 agriculture.* The implementation of the legislation is led by the Minister of Public Health, designated as the central actor in pollution problems. Numerous measures against pollution are enacted within a short period of time. However they 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 purification at the benefit of downstream communes.

(4) 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), keeping the core objective of the former design. The problem of a generalised pollution of rivers, because of a lack of purification, and the problem of frequent floods of fields are persistent. Furthermore aquifers run out in many areas. In the meantime, water uses and industrial activities (for instance, petrol is stocked into depots to face the rise in consumption, and with this kind of stocks risks of pollution are also on the rise) develop and the population is growing fast. In 1963, a new legislative project is proposed, but the adoption is postponed. The government nominates a commission, the *Commissariat royal aux Problèmes de l'Eau*, to work on this matter. The commission examines the states of the water resource, i.e. surface and groundwater, and the needs of the country in the coming years. Its report warns the

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<sup>27</sup> In 1947 the rate of connection to water distribution networks is 56% (Cornut P., 2000, *op. cit.*, p. 68).

<sup>28</sup> The pollution of rivers is growing with the combined effects of industrialisation and urbanisation, that gives rise to protests from the downstream industries and the public opinion.

government against drinking water shortages expected around 1980. 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 1967 on the regulation of non-navigable rivers and the laws 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 purification responsible of the collective systems of purification and with a power of advice on industrial discharges in surface water. 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 protection of groundwater is programmed at a Central level with the advice of water distribution companies.

The main instruments are a general prohibition of pollution unless prior authorisations for discharges are granted, fees and subsidies. They target more precise groups of users, i.e. water companies, petrol companies, farmers, industries and entrepreneurs of works. However such uses as living environment and recreation are still not considered. Once again, the design remains partial. Moreover, it tends to be more pro-active (public financing of purification plants) than reactive (prohibition of discharges). The main weakness of this design 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 purification 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*<sup>29</sup> (VZK), is created in 1975 for the coast territory and an Escaut/Meuse purification company, the *Vlaamse Waterzuiveringsmaatschappij*<sup>30</sup> (VWZ) in 1981. The municipalities are expropriated of their purification 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 purify water to eight associations of municipalities (*intercommunales* of purification). Thus the *intercommunales* become effectively the recipients of State subsidies. Purification plants are then subsidised at a 100% level. The first discrepancies between the two regions are effective.

(5) 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 whilst Walloons search a way to sell water to their neighbours. 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.* Households become target groups and, concerning the instruments, a prohibition of spreading manure from abroad and the environmental permission, twinned with the planning permission, are introduced. Every hazardous activity thus needs a prior authorisation. The Region levies fees on industrial emissions and taxes on households in order to finance water purification. It confirms its leading role in water policy with a complete review of the former institutional arrangement, creating regional water companies. First, the

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<sup>29</sup> Water Treatment Company of the Coastal Basin.

<sup>30</sup> Flemish Water Treatment Company.

*Vlaamse Maatschappij voor Watervoorziening* (VMW), i.e. the Flemish water distribution company is created in 1983, resulting from a split of the *Société nationale des Distributions d'Eau*<sup>31</sup>. The main goal of the VMW is to enhance the inland water production. Second, a single authority becomes competent in water purification, the '*Vlaams Maatschappij voor Waterzuivering*' (VMZ). The decentralisation of the competence doesn't lead to more integration. The leading role of the Flemish Region doesn't reform the sectoral organisation of the administration<sup>32</sup>. The policy design remains partial, while resource protection is still not really taken into consideration.

The picture is different in Wallonia (1982-1995), where the water resource is more abundant and related to more economic interests, such as tourism. The region has hindered the development of an environmental policy<sup>33</sup>. It 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*) and already to realise a rational water management in respect of the European directives. 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*. As in Flanders, the Region takes the leading role but here it leaves a bigger room to the local authorities; communes are highly involved through the *intercommunales* of production/distribution and of purification<sup>34</sup>. The target groups are enlarged to more users, i.e. households, intensive breeders, boatmen and canoeists. 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 purification plants and protection perimeters of wells. The Walloon Region even made an attempt to tax the water exports in Flanders and Brussels, a disposition cancelled by the Belgian constitutional court<sup>35</sup>. Management tools are also developed, e.g. the river contract (13 contracts today), a local and informal mean to co-ordinate water management at a sub-basin scale. Such procedural instruments increase the co-ordination between the different water users but cannot compensate the actual fragmentation of both the legislation and the administrative services, the DGRNE<sup>36</sup>. The main difference between Flanders and Wallonia during this period is that actors involved in water purification are less numerous in Flanders. The existence of a single authority to realise purification

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<sup>31</sup> The Walloon counterpart is the *Société wallonne de Distribution d'Eau* (SWDE), created in 1986. It counts approximately 1,750,000 customers and the VMW 2,380,000.

<sup>32</sup> Initially, the competent administration in the field of water is the *Administratie voor Ruimtelijke Ordening and Leefmilieu*. It becomes AMINAL (*Administratie Milieu-, Natuur-, Land- and Waterbeheer*) in 1990. All the water competence is grouped in the same department (*Leefmilieu en Infrastructuur*) of the same ministry.

<sup>33</sup> Wallonia is more affected than Flanders with the sentences of the Court of Justice of the European Communities (CJEC) about the lack of implementation of European water directives. As the first sentences of the CJEC condemn Belgium without distinguishing the Regions (judgement of 2 February 1982, cases 72/81 et 73/81), the following cases are focus on the Walloon Region: judgement of 17 June 1987, *Commission v Belgium* (case 1/86) and judgement of 5 July 1990, *Commission v Belgium* (case C-42/89).

<sup>34</sup> Local authorities in Wallonia are highly politicised. The seats (mandates) in the boards of directors of the *intercommunales* are distributed according to political majorities in the communes (D'Hondt key). Most *intercommunales* are controlled by coalitions between the (Walloon) Socialist Party and the (Walloon) Christian Democrats Party.

<sup>35</sup> The *Cour d'Arbitrage* motivates its decision with the fact that the new structure of the Belgian State is based on an economic and monetary union where trade cannot be imposed by internal custom taxes. Hereby water is considered as any economic good and not as a resource (Case n°47 of 25 February 1988).

<sup>36</sup> The *direction générale des Ressources naturelles et de l'Environnement* (DGRNE) is competent in the field of water quality. More than co-ordinating its own services, it has to co-operate with other regional administration, i.e. Public Works (*ministère de l'Équipement et des Transports*) for water quantity management, Land-Use Planning and Agriculture.



programs in Flanders is explained by an early implementation of the law of 1971, that was rejected by the Walloon élite. Brussels' water policy is closer to the case of Flanders.

The Region of Brussels-Capital, an urban area on the whole, is more focused on purification 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 purification plants in respect of the 1991 directive on urban wastewater<sup>37</sup>. The competence of purifying wastewater is the single one that remained in the hand of the Region. The institutional arrangement for the implementation of the water policy is very fragmented. Operation of purification plants is given to private companies. The *Compagnie intercommunale bruxelloise des Eaux*, the historical water operator, manages drinking water provision from its own wells, all located in Wallonia. The *Institut bruxellois pour la Gestion de l'Environnement* (IBGE), a regional agency monitors water emissions and manages natural areas (blue corridors for water). The communes are responsible for the sewing and another *intercommunale* manages main sewers and storm basins<sup>38</sup>. Thus the co-ordination between water uses is weak, while instruments as target groups are growing. Although the Region regulates the conduct of these institutions, e.g. with the prohibition of disconnecting water distribution in case of insolvency, and the IBGE realises works of environmental planning, legislation is still sectoral and the arrangement of implementation too fragmented to consider the design of the Brussels' water policy as a strong design.

(6) 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 purification activities and to extend the regulation of discharges to new users (since 1990). The new causal hypothesis is that *if we intensify water purification, 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. Almost all potential water users are designated and a mix of policy instruments is used, e.g. inventories, taxation, limitation of practice and designation of protected areas. The spreading of manure in fields is severely regulated and regulations on nature protection and industrial emissions are reinforced. Nevertheless the main change in the period consists in a complete restructuring of the implementation structure of the policy. The *Vlaams Milieumaatschappij* (VMM), a 100% publicly owned company, is created in 1990 with the tasks of monitoring and reporting on the quality of the regional water, and of planning the building of purification plants. The execution of the works and the management of purification plants are given to NV Aquafin, a private company<sup>39</sup>. Nowadays, the policy design is strong. The policy of surface water quality is conducted in a coherent institutional arrangement. However the coherence is not reached with the other water uses. A law about an integrated water policy, under preparation, could

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<sup>37</sup> The first purification plant, Brussels-South, is in operation since 2000 and has a capacity of 360,000 IE (inhabitants-equivalent) for a cost of 150 Mio EUR. The second plant, Brussels-North, will have a capacity of 1,100,000 IE and should be in operation in 2006. At the contrary of Brussels-South that has been financed by the Region, Brussels-North is build and exploited during 20 years by a private operator, Aqualis, led by Vivendi for a total price of 1 bio EUR.

<sup>38</sup> This new *intercommunale* is the *Intercommunale bruxelloise d'Assainissement* (IBrA).

<sup>39</sup> NV Aquafin is hold at 51% by the 'Vlaams Milieuholding' (Flemish Region), Severn Trent (20%) and institutional investors (29%).

lead to a complete redistribution of competence in the field of water management, formalising the experience of the ‘*bekkencomités*’ (11 basin committees today), a forum of discussion set up by the administration at a tributary basin scale.

The motivations for change in Wallonia are the same as in Flanders, i.e. a persistent pollution of water and the need to satisfy to the European requirements. 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 purification and we regulate discharges and protect specific areas through global permissions, then we will preserve the quality of potential drinking water.* Changes have similarities with Flanders. The targeting of households, industries and farmers is fine-tuned. The environmental permission is introduced that, twinned with building licenses, requires a prior consent to hazardous activities. As in Flanders, the main change concerns the institutional arrangement. The *Société publique de Gestion de l’Eau* (SPGE), a public company, is created in 1999. It manages, according to a management contract signed with the Region, all financial movements linked with water purification and the protection of wells. As a difference, Wallonia adopts an incentive instrument, the full cost pricing, used in the co-ordination of the water distribution sector (production, distribution and purification). The policy design is a strong design. The whole cycle of drinking water is integrated in a coherent framework supervised by the SPGE. The problem is that the links between the drinking water cycle and the other aspects of the water policy are not envisaged, a gap that gives food for thoughts within the regional authorities, in the perspective of transposing the EU water framework directive. In fact, in the three Regions, the institutional arrangement of the leading national environmental topic, i.e. water purification, was reformed. In each case public authorities made an appeal to private capital, even though they did it in their own specific way.

### **III.2 A more complex policy design tempered by attempts of co-ordination**

The study of the evolution of the Belgian water public policies shows major changes (see Annex). The first occurs in 1893, with the decision to stress the quality of drinking water in the country. The consequence is a redesign of the policy at the benefit of public health: building of distribution networks and control of the water quality. After the Second World War, the emphasis moves to the management of wastewater with the observation of persistent pollution problems. A detailed system of authorisation/prohibition targets industry. A better drainage should sustain agriculture. In 1963, the problem is still present and authorities admit that there is a lack of implementation of the existing legislation. The institutional arrangement is redesigned, but implementation fails once again as the regionalisation process is engaged. In fact, the Regions, that covet the environmental competencies, start to develop their own water policy from 1974 onwards. In the 1980s the first regional water decrees<sup>40</sup> focus on the protection of potential drinking water, a strategic matter in the negotiation process of federalism. Then in 1989 in Brussels, in 1990 in Flanders, and 1995 in Wallonia, purification of wastewater becomes the new priority. Regions call for a participation of private actors in the public management. The 1991 European directive on wastewater raises the pressure on Member States. Delays in its implementation make the question still worrying today. As the first evaluations on the policy of wastewater treatment confirm the persistence of a low biological quality of rivers, public authorities think about using broader approaches, a solution also suggested by the European water framework directive in the forthcoming requirements for Member States.

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<sup>40</sup> The regional bills correspond to the federal laws, as there is no hierarchy of the legal norms in the federal Belgium.

Throughout time, we observe a growing complexity in the policy design. First, the number of goods and services mentioned in the legislation is rising. In the second half of the nineteenth century, only uses of consumption and production (industry and farming) are taken into consideration. In the first half of the twentieth century, the list of goods and services is extended to purification and support. After the Second World War, flood control is for the first time subject to a public policy. Concerns for the living environment appear in the 1960s and the use of water for recreation in the 1970s. Flanders also considers water as a strategic reserve in the 1980s. The goods and services of energy production and medical uses are never considered by the legislation. Even if these uses are present in Belgium they remain marginal and very localised. From one phase to another, it is important to mention that water policy evolves with incremental changes. A legal disposition enacted at one point in time remains active until it is revised. It is the case with the law of 1877 about the management of rivers that remains active until 1950, or the law of 1967, on the same topic, which is still in force even if totally out of date. Furthermore, we see that some policies affecting a particular use are revised several times. Outdated dispositions on purification (transport & absorption) are revised in each phase, even often leading to a full change in the policy design.

Complexity in the policy design does not come only from the inclusion of new goods and services, but also in the choice of the target groups and instruments. The target groups are more numerous, first affecting landowners and producers (riparian landowners, of which farmers, and industries) and later more varied types of users (households in 1971, petrol companies in 1971, intensive breeders and canoeists in the 1990s). This broadening of the public action may be justified by a rising water consumption or incoming problems posed by new uses or a generalisation of secondary uses (recreation activities in the 1980s in Wallonia). Nowadays, domestic uses are the first source of pollution. The target groups can be precisely designated in the different phases (*wateringues* in 1846, mineral extractors in 1865, owners of wells in Spa in 1889, boatmen in 1935), especially when they are the final beneficiaries of the measures.

The policy instrument mix becomes also more complex, composed of regulative (obligation, prohibition and authorisation), incentive (subsidies and taxation) and informative instruments. Incentive instruments were developed since 1907 with a policy of public spending, distributing State subsidies for the building of water distribution networks, then taxation measures from 1971. The use of informative instruments is more recent. Institutions such as the VMM in Flanders, distribution companies (*Belgaqua*) or administrations, such as the DGRNE in Wallonia or the IBGE in Brussels, have the formal duty to inform users and suggest good practice. In fact, nowadays water policies mobilise a wide set of instruments, except perhaps self-regulative instruments.

Complexity is also observed in the institutional arrangements. Competencies in water policy are divided into an increasing number of actors of implementation. At the beginning (1846-1893), actors of implementation are the Minister of Public Works, provinces and communes. Even if these ones kept important competencies until now, the institutional arrangement is enlarged to new actors. At the central level, it is completed by the ministers of Agriculture, Internal Affairs and then Public Health, the last ones taking progressively a leading role until the regionalisation. After 1980, this leading role is assured by regional administrations of the environment, such as AMINAL in Flanders, the DGRNE in Wallonia and the IBGE in Brussels. The development of various specialised actors is also impressive. The first is the Royal Academy of Medicine in 1924, *polders* and *wateringues*' assemblies in 1956, water basin companies in 1971, *intercommunales* in Wallonia since 1977, water distribution

companies since 1990, public and mixed companies in the 1990s such as VMM, Aquafin and the SPGE. Amongst such developments towards more complexity, few have been done in order to assure more co-ordination. Initially, the approach of the public policies is sectoral, enacted to tackle one problem after the other. The first, partial but explicit, attempts to co-ordinate water policy are made in the field of surface water in 1950. Reduction of emissions is coupled with a law of purification. Co-ordination is made with the management of water. Curage, an activity taken over by public authorities, eases drainage of fields, the flow of the rivers rises and the pollution is evacuated, according to the idea of letting water flow as fast as possible to the sea. This orientation is reinforced in the law of 1971 that creates the water basin companies in charge of delivering emissions permits and building purification plants.

Nowadays, the VMM is build on this idea. In Wallonia, the upcoming environmental permission should link emissions with land-use planning and the cycle of distribution water should be reflected in prices. The relative concentration of competencies in the hand of the DGRNE hides difficulties to co-ordinate the internal services. River contracts and basin committees put together all the other aspects in an information/collaboration mechanism. Binding links between those various fragmented co-ordination processes are not expected. In Brussels, even if the whole environmental policy is supervised by a single office, the IBGE, public decision and implementation processes are still very segmented. As a conclusion, even if the rising complexity tries to be circumscribed by the policy design, the attempts to co-ordinate remain partial and the political will needs to be strong to bring them to success.

## **Part IV. Water regimes**

The evolution of the institutional water management throughout the covered period (1804-2001) can be understood as a succession of water regimes, that become increasingly complex and eventually develop forms of integration. The delimitation of periods representing different water regimes is deducted from the convergence in changes both in the property right system and in the policy design. Successive regimes often stretch on longer periods than property rights or policy design phases, because regime changes correspond to a fully-fledged change in the logic of intervention of the State. Regimes are successively driven by considerations on agricultural development, water distribution, public health and in the last periods water protection. In many occurrences, regime change is led by changes in the policy design. But in most cases, water is perceived as an element of a broader sectoral policy, e.g. economic development, public health and nature protection. In any case, the specific resource approach of water cannot be envisaged before the development of knowledge on ecosystems, i.e. the 1960s<sup>41</sup>.

### **IV.1. Regime evolution as a combination of the property rights and the policy design**

(1) As shown in table 4, the first period (1804-1893) corresponds to a regime where the development of agriculture is stimulated. The regime begins with the adoption of the Civil Code that designs the regulative system in general terms. Water is cut in categories and water ownership is included in land ownership, i.e. private property in general. The sole exceptions are navigable rivers and canals that are State properties. An economic matter justifies this status, i.e. the necessity to maintain the rivers for navigation purpose, i.e. the free circulation of goods. As soon as ownership is distributed in general terms according to the principle of private property, limitations are introduced in favour of the economic development, mainly

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<sup>41</sup> Delort R., Walter F., 2001, *Histoire de l'Environnement européen*, Paris, PUF.

Table 4: Successive institutional water regimes from 1804 to 2001

Phases		Property rights	Policy design	Institutional regime
1. 1804-1893: Development of agriculture		<b>Property right focus</b> Civil Code Priority on drainage, irrigation and navigation	<b>Policy focus</b> Promotion of drainage & irrigation Protection of the mineral water springs of Spa Pollution of rivers with particles and heavy metals	<b>Simple regime</b> Low scope High coherence
2. 1893-1945: Building of water distribution networks		Expropriation at the benefit of water companies	<b>Policy focus</b> Focus on water distribution Control of water sold in shops	<b>Simple regime</b> Low scope High coherence
3. 1945-1980: First attempts to fight against the pollution		Limitations in disposition rights of riparian landowners Presumption of public property of non-navigable riverbeds	<b>Policy focus</b> Protection of surface and groundwater, but lack in implementation Cleaning out of rivers at the expense of public authorities	<b>Towards a complex regime</b> Medium scope Low coherence
4. 1980-1990/95: An effective regime to protect water at the regional level	Flanders (1980-1990)	Transfer of the public domain to the Regions. Capacity of expropriation Prior authorisation for withdrawing groundwater	<b>Policy focus</b> Transfer of most environmental competencies to the Region Policy of hydrous independence Global environmental permission	<b>Complex regime</b> Medium scope Medium coherence
	Wallonia (1980-1995)	Transfer of the public domain to the Regions Prior authorisation for withdrawing groundwater Regulation of use rights	<b>Policy focus</b> Transfer of most environmental competencies to the Region Preservation of the quality of potential drinking water (surface and groundwater) (River contracts)	<b>Complex regime</b> Wide scope Medium coherence
	Brussels-Capital (since 1989)	Transfer of the public domain to the Regions Capacity of expropriation Regulation of use rights	<b>Policy focus</b> Transfer of most environmental competencies to the Region Environmental permission & nature preservation	<b>Complex regime</b> Wide scope Medium coherence
5. 1990/95-: Attempts towards integration	Flanders (since 1990)	<b>Property right focused</b> Expropriation for the management of dams and dikes associated with natural and recreation objectives Expropriation for the purpose of nature conservation	<b>Policy focus</b> Quality of surface water assured by a public/private partnership (VMM, Aquafin). Taxation of emissions Regulation of the spreading of manure in fields Informal attempt to co-ordinate different water uses at a tributary basin scale Basin committees	<b>Towards integration</b> Wide scope High coherence
	Wallonia (since 1995)	Regulation of uses: prohibition to build on riverbanks and to prejudice fauna and flora	<b>Policy focus</b> Global environmental permission Co-ordination of the whole water distribution cycle (SPGE) Further attempts to co-ordinate other uses with management plans River contracts	<b>Towards integration</b> Wide scope High coherence

agriculture, nevertheless in an attempt to find an equilibrium between the rights and duties conceded to the riparian landowners. The policy-design mainly encourages drainage, a task conferred to associations of users, the *polders* and *wateringues*. The regime results from an adequacy between the property right system and the policy design based on a common occurrence in developing agriculture. Thus its coherence is high. Moreover, it focuses on a single use. It has a low scope. This simple regime is driven by the property right system. In fact, riparian landowners (farmers in most cases) are the central economic actors and land is the most important production factor. When users and owners are the same persons, they are more easily regulated by changes in the property rights than by new directions in the policy design.

(2) Since 1893, when the low quality of water provisions and its danger on public health are recognised, the State action is re-oriented and gives birth to a regime focused on the development of water distribution networks (1893-1945). Concerning property rights, the only change is the possibility of expropriation at the benefit of water companies and the institutionalisation of monopolies in the production of mineral water. With regard to the policy design, public action focuses on the financing of works and the creation of appropriate legal structures in favour of the development of public water distribution networks throughout the whole territory. Adequacy between the two elements of the regime is assured by a common concern for drinking water. The aim is to organise a wide water distribution at a low price. The small adaptation of the property right structure does not create strong rivalries with landowners. Of course, irrigation is not a strategic need in Belgium and the regime corresponds to the period of hygienism. The consensus is high about improving public health. The regime once again focuses on a single use, i.e. drinking water. The scope is low and the coherence high, because of the adaptation of the regulative system to the leading design. So the regime is led by the policy design. State action is commanded by public initiative: there is a redistribution of subsidies in order to build the distribution networks.

Two remarks have to be made at this point. First, uses concerned by the successive regimes are cumulative. Concerns for agriculture don't disappear in the second period. The existing dispositions remain active. Second, industry develops during this regime. Heavy industries based on carbon transformation need much water. But no rivalries and no problem of provision appear between these new actors. The absence of specific legislation indicates that the regulative system settled at the benefit of agriculture is also fit for industry. Industry can get concessions from the Central State to withdraw water in navigable rivers (public domain), and transporting it when it does not border these rivers thanks to the *servitude d'aqueduc*. It can equally settle along non-navigable rivers and, as a riparian landowner, use the related right of withdrawal.

(3) At the end of the Second World War, the emerging Welfare State reinforces the public management of water. The acknowledgement of persistent pollution problems in rivers and the chronic floods give rise to a regime of punctual water protection (1945-1980). The main idea is to limit emissions and to accelerate the flow of water in order to throw pollution out to the sea. The law recognises a presumption of public property in non-navigable riverbeds. Disposition rights are limited for *polders* and *wateringues*. Their competence in the cleaning out and works in rivers is limited and the State controls the maintenance of their installations. **Such** dispositions facilitate State intervention. The policy design gives the full charge of cleaning out the rivers to the public authorities and puts a prior authorisation on works along rivers. Furthermore, surface water is protected by the building of collective purification plants for urban wastewater, and groundwater by the setting of protection perimeters around wells. Industrial emissions are limited. The relative ambition of this design must not hide a failure in implementation. Public policy is still oriented on public health. The final aim is to secure water supply. Adequacy between the property right system and the policy design lies in the common concern on purification and flood control. As drinking water is also included, the scope of the regime is medium. The number of actors concerned is growing (owners, target groups and actors of implementation) without any mechanism of co-ordination. The coherence of the regime is low. As in the case of the two former ones, this regime is oriented towards water exploitation (versus water protection). It is driven by the public policy. The regulative system adapts to the growing State intervention in the water management.

(4) The Belgian process of decentralisation is effective in 1980. It leads to regional water regimes. The public domain is transferred to the Regions in most of their environmental competencies. The three resulting regimes set by Flanders (1980-1990), Wallonia (1980-1995) and the Region of Brussels-Capital (1989 onwards) differ in their arrangement even though they all tend to a systemic water protection. The measures taken both in the property right system and the policy design differ from one region to another. Regional orientations may be guided by the relative scarcity or the strategic interest of water. Concerning property rights, Flanders and Wallonia introduce a prior authorisation to withdraw groundwater while Brussels does not. Wallonia, like Brussels, also regulates use rights with the aim to protect the environment. Furthermore, Brussels enables formal expropriation in favour of nature preservation. Concerning the policy design, both Flanders and Brussels decide to implement the laws of 1971 on the protection of surface and groundwater and adopt an environmental permission for the industrial discharges. Flanders develops a policy of hydrous independence as Wallonia enacts a new legislation on the protection of surface water that would be financed by water exports to the other regions. The Court cancels the disposition. Wallonia regulates also secondary uses, such as canoeing. Thus the adequacy between the property right system and the policy design differs from one region to another. Flanders has the will to preserve strategic reserves of water, motivated by a strong pressure on the resource, and Brussels to restore the quality of surface water. Wallonia combines both as it aims at the protection of every potential drinking water, be it surface or groundwater, and the respect of the rivers' environment, as an element of tourist attractiveness.

Under the present regimes, two elements characterise Flanders from the two other regions. The first element is that the range of uses is not extended to new uses, as in the case of Wallonia and Brussels consider the living environment and recreation activities. The second element concerns the institutional arrangement for implementation. Flanders merges purification activities within a single company, the VMZ, that also gives advises about the environmental permissions on industrial emissions. Co-ordination is high, but limited to purification. Wallonia introduced the river contracts in 1993, that aim at co-ordinating all uses at a local scale. However, it remains a limited and non-binding collaboration process. In Brussels, the environmental competence is centralised but no co-ordination is envisaged with and between the other water actors. In the three regions, the regime is complex as uses are extended, but co-ordination is limited to first attempts. It is again policy-focused, as changes in property rights are residual. Protection aspects are rising while the Flemish and Walloon regimes are oriented towards the production of drinking water. The difference in scope between the Flemish and Walloon regimes at that time must be moderated. As the Walloon regime is stretched on a longer period (until 1995), some new considerations, such as regulation of secondary uses and environmental planning, appear at the same time in Flanders, i.e. between 1990 and 1995, but are considered in the next regime. In Brussels, the regime is more oriented towards protection, as production activities exert no strong pressure on the resource. It is still in place today.

(5) Only Flanders and Wallonia witness a transition towards integration in the early 1990s. Regional regimes are consolidated in favour of water protection. The Flemish regime (from 1990 onwards) and the Walloon regime (from 1995 onwards) are both characterised by first attempts in integration. The property right system is reformed in Flanders. Legal dispositions on formal expropriation are set. They concern nature conservation and the management of dikes in favour of nature and recreation. Formal ownership rights can be limited for the resource protection. In Wallonia, interventions are limited to use rights. Concerning the policy design, both regions focus their intervention on purification. Flanders chooses the way of

privatisation, while Wallonia chooses the way of contracting. The tandem VMM/Aquaflin integrates the whole policy of surface water quality. VMM monitors the quality of surface water, gives advices on environmental permissions and elaborates the investments plans for purification. These plans are implemented by Aquaflin which builds and operates the collective purification plants. In Wallonia, despite the fact that environmental permission are established on the Flemish model, the Region doesn't follow the same way. Integration is led by a financial integration of the water distribution cycle, i.e. production and distribution of drinking water and purification of domestic wastewater, that the SPGE organises. In Flanders, the adequacy between the property rights and the policy design is oriented towards protection of the water resource, including the living environment. In Wallonia, change is entirely led by the policy design. The two regimes have a high scope as Flanders enlarges its concern to living environment and recreation.

Co-ordination is reinforced in both regions. In Flanders, VMM controls the water policy and secondary uses are considered in the basin committees (informal consultation fora at a tributary basin scale). There are no strong links between these two attempts of co-ordination. In Wallonia, the water distribution cycle is integrated but without taking industrial water, including industrial discharges, and secondary uses into account. The task of co-ordinating the quality approach has been given to the DGRNE but the preliminary management plans are still undone. The management plans should inventory all uses and measures at a tributary basin scale, in anticipation of the European water framework directive. Currently the regional resources are concentrated on the building of purification plants necessary to satisfy to the requirements of the 1991 directive on urban wastewater. The high coherence identified in the two regimes shows that the Flemish and Walloon regimes are on their way to integration.

In particular, the Flemish regime is the first to limit economic activities in favour of water protection. Even if a logic of production, i.e. the capacity to produce drinking water, is the leading concern, the situation reflects the awareness of the regional authorities about the need to manage water sustainably in order to secure water provision. Moreover, the current Flemish regime is both property right and policy-driven. Measures taken in each category follow their own logic at the difference of earlier regimes where property right changes were coming in support of the policy design changes. Here, changes in property rights produce their own effects in favour of the environment. Both sets of intervention aim at a better protection of water.

#### **IV.2. Analysis of regime transitions towards integration**

If we look at the general development of regimes, we observe that changes are mainly policy-driven and oriented towards more exploitation of the water resource. In the first regime, changes are property-driven, at a time when water users are water owners, i.e. landowners, and when the land is the major production factor. Afterwards, regimes are policy-driven as water uses disconnect progressively from land, and consequently from ownership, at a time when land is loosing its economic importance. Then appears the necessity to develop new forms of regulation, i.e. public policies, as more and more water users are non-owners. As a consequence, the successive regimes from 1893 to 1990 (regimes 2-4) are policy-driven and the property right structure marginally modified in order not to enter in contradiction with these forms of public intervention.

The first considerations for nature preservation appear in the 1960s. The scientific discoveries of eco-systemic interactions trigger renewed interest of land in water policies, but with an inverted priority. People become progressively aware of the necessity to protect the water



resource. Furthermore, the perception of water as a resource is also recent. Then public policies tend to develop in order to fight against pollution. The model of State intervention, however, soon showed its limits. Water ownership is still attached to land and protection can hardly be organised without the consent of the owners. What if the landowner isn't a water user, has a limited perception of its entitlement and no means to protect its good? Nowadays, in Flanders (and, to a lower extent, in Brussels), we observe a qualitative leap, a paradigmatic change in direction of the property right system. Interventions on property rights prove a renewed interest, as the limits of interventions of public policies on diffuse pollution seem to be reached. Flanders has the capacity to expropriate at the benefit of nature conservation. If the State wants to protect the water resource, particularly groundwater and wetlands, it has to take the formal ownership of the above or surrounding land. The fact that the legal order established by the Civil Code (and the accession principle) is still in force constrains the State to limit property on land in order to protect water. A new question may arise: is the State capable of managing land properly? In fact, a full consideration of the resource approach should lead to a reform of the property rights on water. Co-ordination seems to be not enough to get integration. A leap from complex to integrated regime is likely to proceed through a reform of the property right structure, reconsidering the connection between land and water.

Regime transitions do not only concern the property right structure, but the entire water management. Moving from a regime to another implies a wide range of changes. In order to identify these changes we consider them under the light of the governance criteria. Then we examine changes in scale, participation, uses, targets and co-ordination. As it would be too long here to describe the transitions of each regime, we describe the last transitions from complex to (partially) integrated regimes, i.e. the Flemish and Walloon regimes.

(1) In terms of scale, the resource approach is not fully accepted. The initial reluctance of the Regions towards a river basin approach is understood in the context of the regionalisation process. With respect to the territorial delimitation of the Regions, basins are trans-boundary. Thus, retrospectively, the creation of basin companies in 1971 was bound to fail. The transition then pursues a regional approach. Initially, Flanders decides to abandon the river basin approach when it merges its basin companies into a single regional company in 1989. However, the administration now recognises delimited tributary basins and tries to co-ordinate its activities at this scale in the basin committees. But basin committees do not encompass the whole water sector. The management of the quality of surface water is given to the VMM which acts at a regional scale. However, the VMM now also realises its water quality plans at the tributary basin scale. In Wallonia, the *intercommunales* of purification are organised by provinces. With the transition, they are becoming contracting parties of the SPGE, in a process of centralisation. The basin vision is under development with the expected management plans that the DGRNE is to issue. As pointed out earlier, the remaining problem with the basin approach in Belgium is that river basins cross the regions. As the Regions decided to manage economic and environmental matters on their own with the federalisation, the creation of true basin authorities was bound to fail. But an inter-regional cooperation is foreseeable with the international river management approach applied to the Escaut and the Meuse. River basin management is on the way but it remains an arrangement to set up.

(2) Participation of water users to the decision-making process is not widespread in Belgium. It has however developed in the current regimes. First a regional commission is entitled to give its advices on legislative proposals. In Flanders, it is called the MINA-Raad, the Flemish Council on Nature and Environment, which is a representative structure of the civil society (unions, lobby groups, environmental associations, etc.). In Wallonia, the Consultative

Commission for the Protection of Water represents the civil society in the same way. Second, consultative/collaborative structures are set up at a local level (presumably at a tributary basin scale). In Flanders, the basin committees are such informative fora. In Wallonia, the river contracts organise collaborations between local actors on the management of river and secondary uses. These fora cannot be perceived as tools of a pro-active water management, but more as structures of resolution of local conflicts. Nevertheless, a broad-based collaboration on the main initiatives, e.g. works of infrastructure for production or purification of water, is not foreseen in Flanders nor in Wallonia.

(3) The transition to an integrated regime is illustrated by the inclusion of more uses. It also brings more complementarity between the uses concerned either by the property rights or by the policy design. The regime transition in Flanders broadens the scope of uses considered, extending it to recreation activities and the living environment. Like in Wallonia and Brussels, all water uses are considered in the regime.

(4) In general, the regime transitions towards integration lead to a reinforcement of the measures targeting the same users. The targeting is defined as the way target groups and owners are affected by changes. Particularly, measures affecting industries and households are reinforced. Taxes on water consumption and on discharges finance purification. Furthermore, but only in Flanders, farmers are affected by strong limitations on manure spreading and riparian landowners can formally be expropriated at the benefit of living environment and recreation. The situation is quite similar in Brussels. In general, the set of instruments of the policy design is broadening. Particularly, incitative instruments, such as a clarification in prices of drinking water, are developed. In general, the regime towards integration also establishes the limits of public policy interventions and highlights the need to focus once again the action on owners in order to reach water protection objectives. Flanders uses the means of expropriation, which means that the Region is forced to buy the land if it wants to take the protection of water in charge. Can an integrated policy be effective without reconsidering the ownership structure on water?

(5) The transition from a complex to an integrated regime should lead to more co-ordination. In Flanders and Wallonia, we observe attempts of three kinds. In both regions, the task of conceiving and implementing the water management remains the competence of the regional administrations, although these administrations were discharged of a part of water management. Several structures in charge of water (e.g. VMM or SPGE) attempt to reach integration but they keep constrained by the limits of their competencies. So the integration remains partial. In Flanders, it is the case for the quality of surface water. Industrial and domestic discharges, measures of the quality of the rivers and programmes of investments in collective purification plants are all the responsibility of the VMM. In Wallonia, integration affects the whole water distribution cycle. The SPGE realises a financial integration of the water sector by contracting with regional operators.

The second attempt of integration consists in establishing environmental plans. The task is generally given to the administration, but without clear targets and no means to collect the data.

The third attempt of integration is based on local consensus. Here again the two regions initiated different structures. In Flanders, the basin committees, created during the last transition, are set up by the administration in an informal way. Organised on a tributary basin scale, they allow civil servants to be informed of what their colleagues do and, in an extended

composition, to inform water users and collect reactions. In Wallonia, the initiative to organise a local consensus, called the river contract, is left to the initiative of the communes. Projects of the local authorities of different levels can be confronted in a non-binding way and secondary users can commit themselves in an action, at their own expense, in order to improve the quality of the water and the natural aspects of the rivers. The main weakness of all these co-ordination attempts is the lack of coherence between them. For instance, the basin committees or the assemblies of the river contracts cannot intervene in the choices concerning the quality of surface water in Flanders or the water distribution cycle in Wallonia. Co-ordination could be expected from the regional administration, but it has no resource and no clear objectives to go in this direction. A full co-ordination of the water management needs political will and a force of conviction vis-à-vis the different groups of actors.

What are the explanatory factors triggering such transitions? As these factors involve actors of different sectors and various events, we limit our understanding of transitions to six working hypotheses or interpretations formulated on the basis of the recent developments of water regimes in Belgium.

(1) Above all, the European Union puts a strong pressure on the Member States. The requirements of the 1991 directive on wastewater lead to the reorganisation of regional water sectors. The fact that Flanders anticipates the legislation is easily explained by the direct participation of Belgian regional authorities in the EU decision-making process. Each region adapts to the directive in different ways, although the main problem is similar for all of them: the financing of the required infrastructure of purification. The Regions imagine new systems to finance the investment, organise the collection of new taxes and open the institutional arrangement to the private sector. As a result, Belgium is blamed for delays in implementation of most European water directives and is frequently condemned by the European Court of Justice<sup>42</sup>.

(2) Change is also provoked by the pressure of the problem itself. First, differences in the levels of internal pressure induce different paces of adaptation. Flanders is in advance because of the strong pressure exerted on its capacity to produce drinking water. Demand-based measures are taken in Flanders today. Second, the pressure forces the authorities to look for broad solutions. Belgium is at the heart of the international basins of the Meuse and the Escaut. It receives polluted water from France and sends pollution to the Netherlands, where surface water is the only source of drinking water production. The situation calls for an international collaboration concerning the protection of these rivers. In fact, Flanders is more integrated and pushes more in the direction of integration because of an higher threat of water shortages.

(3) The water sector exerts pressure on policy makers in favour of a redesign of the purification policy. Following the 1991 directive, the economic perspectives lead to a take-off of that sector. The financial means mobilised to build the purification plants attract the private sector. Private companies develop their services in order to be more implicated in the day-to-day management of water. The weight of the production sector in the transition also corresponds to a continuous orientation of the regimes towards water exploitation. It is obvious that water management goes towards more water protection. Nevertheless, we see that the development of protection uses is stimulated by complementary relationships with

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<sup>42</sup> A series of 10 cases are already judged from 1982 to 2001: judgements of the 2 February 1982 (cases 72/81 and 73/81), 17 June 1987 (case 1/86), 5 July 1990 (C-42/89), 11 June 1991 (C-290/89), 5 May 1993 (C-174/91), 21 January 1999 (case 207-97), 25 May 2000 (C-307-98), 6 July 2000 (C-236/99), 14 June 2001 (C-230/00).

production uses. For instance, the development of water protection enables the production of drinking water and supports the development of a production sector specialised in purification. As a consequence, the most difficult environmental protection measures to enact are those that favour water protection without any expectation of return for production uses. In the same way, the fact that water policy remains supply-oriented is surprising. The regimes still tend to develop the production capacity of water rather than reduce consumption. Only Flanders starts issuing demand-oriented measures, as the legislation compels new houses to be equipped with rainwater tanks.

(4) Environmental groups also play a significant role in regime transitions towards more integration. However, their influence is more indirect. Their intervention came first through the preservation of species and land-use planning. Progressively, they obtained access to the water arena, by successfully putting concerns of land-use planning into the water policy. Planning has a strategic importance, since it leads to modifications of property rights on land and, by extension, of property rights on water. The delimitation of zones creates the need to expropriate. In recent times, environmental groups become more influential. The interest for their claims mainly dates back to the 1992 Declaration of Rio and the recognition of the importance of bio-diversity. Furthermore, in Belgium, their links with the administration increased with the accession of the green parties (Ecolo/Agalev) to the government in 1999.<sup>43</sup> The acceptability of their claims also comes from the complementarity of the latter to the interests of water producers. Furthermore, environmental groups have an indirect power of conviction, as they organise campaigns, promoting the preservation of wetlands and an integrated water management. Thus, they have an important role with regard to the public awareness of environmental problems.

(5) Regional differences are partly explained by institutional “settings”. First, the water regimes are redesigned under the pressure of changes in the polity. The federalisation process led to new regimes at the beginning of the 1980s and weaknesses of the new regional structures contributed to the last regime changes. The second type of institutional influence is linked to the political culture of the élites. In Flanders, people are keener on concentrating power in broad structures, a position reflected in the 1971 law. In Wallonia, the development of local competencies is favoured. The communes keep the hand on the water purification sector (under the control of the political parties) while they were expropriated in Flanders. Different political cultures lead to diverging regional paths in the development of the water regimes.

(6) Finally, water regimes are influenced by inter-policies co-ordinations. Water policies seem to be systematically legitimised by other dominant policies. The dominant policies in question are successively agriculture, industry and public health. They justify needs in infrastructure. Nowadays, the dominant policy that seems to emerge is the environment. Environment is for instance invoked to justify a limitation of industrial emissions (environmental permits), while in the past the justification of it was brought by public health concerns (workers’ protection). Concerning the current water regime, preservation of the environment also seems to become the justification for new measures, focused on both the protection of the living environment and the production of drinking water.

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<sup>43</sup> Green parties are part of the Federal government, and of the two main regional (Flemish and Walloon) governments. Due to tensions in the portfolio allocation phase of negotiations, they decided not to join the Brussels government.

## V. Conclusion

In recent times, the evolution of the Belgian water regimes is characterised by the emergence of regional water institutions, for considerations that are external to the water sector. Initially, the laws of 1971 are very progressive. They set legal dispositions to protect aquifers and to manage surface water at a river basin scale. The regime change is led by a strong pressure on the resource due to pollution. It gives birth to a completely new institutional arrangement programming the creation of three basin companies. The model for such an arrangement of basin agencies comes from France (in a 1964 law). Later, the federalisation process hampers the implementation of the legislation and the Regions want to develop their own framework. Particularly, Wallonia organises water management around the responsibility of the communes in water distribution and purification. Since the 1980s, the three regional water regimes diverge at the same time as the Regions set up their new administrations. The divergence is characterised by an ignorance of the regional actors about what is done in the other regions in terms of water management. In the last transition period, the regional authorities do not try to take advantage of the lessons drawn from the past experience of other regions of the country. They rather look at experiences in the neighbouring countries. The different regional water regimes end up being very dissimilar, as they are inspired by different models from abroad (France and the Netherlands).

Moreover, discrepancies in regional regimes concern both the property rights and the policy design. Between the three regional regimes, the difference in interventions in the property right structure results from political choices. The decision to modify property rights is taken despite the fact that such a choice will influence water uses and the renewability of the resource. The content of a regime results from strategic choices between interventions on property rights and on the policy design. Such a finding confirms the relevance of a model of analysis that combines both the property right structure and the policy design.

The present analysis of the institutional water regimes in Belgium would not be complete without considering the current necessity for Belgium to transpose the European water framework directive in its legislation. It is important to remind that two important river basins cross the regions. Today, the single inter-regional co-ordination tools are the international commissions for the protection of the Escaut and the Meuse. Moreover, these commissions are only in charge of the quality aspects of the river. They cannot consider the whole basin nor the quantity aspects. Even if, in the future, the commissions become international basins authorities, it will be difficult to organise a multi-level water management with different institutional arrangements between countries and, especially in Belgium, between regions.

Under the current setting, the river basin management ought to be conducted by the Regions in isolation. Between the regions, the problems stressed and the arrangements designed are not completely different. With regard to the problems, the three regions have to fill the gap in the field of purification. Concerning the institutional arrangement, similarities appear. The water competence is fragmented between various regional actors, with dissimilar resources and objectives. On the one hand, the financial resources are invested in purification. The institution responsible for this is mono-actorial. It has an opaque financial and technical management and plans the purification plants without consultation. Furthermore, their public/private structure limits the control of the administration on their activities. The policy is distributive, assimilated to a positive sum game, where all implicated actors win. On the other hand, there is a necessity to set up plans of measures at the scale of the (tributary) river basins. This implies measures of restriction and control of the police of the environment. The

organisation of a participative management inducing transparency in management is also required. The setting is multi-actorial and leads to a policy of redistribution (zero sum game). Rivalries between newcomers and historical actors have to be managed and equilibriums between protection uses and production uses of water have to be found. This is the task of the competent basin authorities as they are envisaged in the water framework directive. This task consists of the already existing competencies of the administration. Whatever the competent authority, it will need financial resources and a strong political support to succeed.

The similarities in the situation of the regions do not go much further. In the context of the water framework directive, the main question is about the expected role that the administration will play in the integrated water management. Here, the divergence between Flanders and Wallonia is clear and can be deepened in the future. In Flanders, one company, Aquafin, operates in the sector of purification, under the control of a public body, the VMM. The basin committees are managed by the regional administration. Thus, in Flanders, the institutional arrangement in the field of water is highly centralised. As the administration concentrates knowledge on the resource and experience of the consultation at the local scale, it is foreseeable that it will take an increasingly leading role in the integrated water management. In Wallonia, the situation is different. A regional company, the SPGE, centralises and redistributes resources collected in the water sector. It controls both the activities of purification and protection of groundwater, depends as much on the communes (through the *intercommunales*), as on the regional administration. In other respects, the river contracts are initiated and animated at a local level with the implication of the communes. Thus, the Walloon administration is more or less in a marginal position, even though it is entitled to draw the plans of measures. As the SPGE will certainly have no interest in managing all environmental and quantity aspects of water management, the fragmentation of the current arrangement will be hard to overcome in order to reach an integrated water management. Although we observe today a relative marginalization of the regional administration in both regions, the Flemish administration seems to have a higher capacity to get a leading role in the upcoming integrated water management. In such conditions, a harmonisation of institutional water regimes in Belgium is not expected. The challenge is to realise an efficient river basin management at a supra-national level, stimulating the current co-operation between the different parties.

**ANNEX : Phases in the development of the policy design concerning water policy in Belgium**

Phases	Policy design	Actors of implementation
<b>1. 1846-1893: Punctual protection of watercourses</b>	<p><i>Objectives:</i> preserve public health, limit water flooding &amp; promote drainage  <i>Causal Hypothesis:</i> if we prohibit the most hazardous discharges in water courses, then we will avoid important disease  <i>Instruments:</i> obligation to clean out waterbeds, prohibition of most hazardous discharges, regulation of pumpings (Spa)  <i>Target groups:</i> riparian landowners, industries, <i>polders</i> and <i>wateringues</i></p>	Minister of Public Works, provinces, communes
<b>2. 1893-1945: widening of distribution networks</b>	<p><i>Objectives:</i> organise a good water supply, protect groundwater partially, monitor the quality of water products  <i>Causal Hypothesis:</i> if we develop public water distribution and regulate the sale of water products, then we will improve public health  <i>Instruments:</i> 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  <i>Target groups:</i> communes, riparian landowners, mineral water producers, boatmen</p>	Ministers of Agriculture, Public Works, and Internal Affairs, government, Royal Academy of Medicine
<b>3. 1945-1963: Punctual water protection against pollution</b>	<p><i>Objectives:</i> reduce the pressure on surface water due to the development of the industry and clean out waterbeds for the drainage of fields  <i>Causal Hypothesis:</i> 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  <i>Instruments:</i> general prohibition of pollution, prior authorisation for discharges, authorisation for works, subsidies for cleaning out  <i>Target groups:</i> industries, communes, riparian landowners</p>	Ministers of Public Health, Agriculture, and Public Works, provinces, communes, <i>polders</i> and <i>wateringues</i>
<b>4. 1963-1982: Systematic water protection</b>	<p><i>Objectives:</i> 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  <i>Causal Hypothesis:</i> if we protect springs and wells and we purify waste water, then we will secure water supply and strengthen public health  <i>Instruments:</i> cleaning out done by public authorities, general prohibition of pollution and prior authorisation for discharge, subsidies for the building of public and private (industrial) purification plants, fees on discharges for industries and taxation of households  <i>Target groups:</i> 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 companies of the coastal basin (1975) & the Schelde/Maas basin (1981) in Flanders
<b>5. Regionalisation of the water policy</b>		
<b>5a. 1982-1990: Flanders</b>	<p><i>Objectives:</i> preserve the quality of every potential drinking water (surface and groundwater) and limit water imports from Wallonia  <i>Causal Hypothesis:</i> if we protect wells from (diffuse) pollution and we regulate discharges through global permissions, then we will develop our own capacities to produce drinking water  <i>Instruments:</i> 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 purification in application of the 1971 law)  <i>Target groups:</i> water producers, farmers, industries, households</p>	Regional executive, provinces, communes
<b>5b. 1982-1995: Wallonia</b>	<p><i>Objectives:</i> preserve the quality of every potential drinking water (surface and groundwater) and realise a rational water management  <i>Causal Hypothesis:</i> 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  <i>Instruments:</i> 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 purification, taxation of exports, subsidies for purification plants to the <i>intercommunales</i> and industries  <i>Target groups:</i> <i>intercommunales</i> of water production, industries, intensive breeding, households, boatmen, communes, <i>intercommunales</i> of purification</p>	Regional executive, communes, water distributors (tax collection), <i>Inspection générale de l'Eau</i> (regional administration), regional taxation office
<b>5c Since 1982: Region of Brussels-Capital</b>	<p><i>Objectives:</i> rationalise the environmental management, improve water quality, respect the European requirements and guarantee the supply with drinking water to anybody  <i>Causal hypothesis:</i> 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  <i>Instruments:</i> environmental exploitation permit, prohibition of interruptions in water supply, fees on emissions, subsidies for investments in purification  <i>Target groups:</i> industries, IBDE, entrepreneurs, farmers, boatmen, fishermen, households</p>	Regional executive, regional administrations including IBGE, CIBE-IBDE (water producer), communes

<b>6. Deepening the regional policies</b>		
6a. 1990: Flanders	<p><i>Objectives:</i> react against persistent pollution of aquifers through a complete restructuring of the implementation of the Flemish legislation</p> <p><i>Causal Hypothesis:</i> if we intensify water purification, 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><i>Instruments:</i> annual inventory of emissions of pollutants, fees on discharges for industries and taxation of households for water purification, limitation of manure spreading, natural protection zones</p> <p><i>Target groups:</i> farmers, industries, households</p>	Regional executive, Mestbank (VLM), AMINAL, VMM, Aquafin
6b 1995: Wallonia	<p><i>Objectives:</i> restructure the water sector (production, distribution, purification), conform to the European requirements, set a global and integrated water management</p> <p><i>Causal Hypothesis:</i> if we intensify water purification and we regulate discharges and protect specific areas through global permissions, then we will preserve the quality of potential drinking water</p> <p><i>Instruments:</i> 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><i>Target Groups:</i> industries, farmers, boatmen, communes, <i>intercommunales</i> of production and purification, households</p>	Regional executive, DGRNE, DGATL, SPGE, water distributors, communes





**EUWARENESS** is a research project on **European Water Regimes and the Notion of a Sustainable Status**. Research institutes from six European countries (Netherlands, Belgium, France, Spain, Italy, Switzerland) have been cooperating in this two year project (2000-2002). The project is supported by the European Commission under the 5th Framework Programme, and co-ordinated by the University of Twente in the Netherlands.

The EUWARENESS-project has focused on sustainable use of water resources by means of integrated water management. It aims to contribute to the implementation of the EU Water Framework Directive. A better understanding is needed of the dynamic relationships between various conflicting uses of water resources, the regimes under which these uses of water resources are managed, and conditions generating regime shifts towards sustainability. The EUWARENESS-project studied the long term evolution of 6 national regimes, and also - more in depth - the specific regime transitions of 12 water basins across Europe during the last decades. Important issues are the participation of users, redistribution of property rights among users, the coherence between water rights and water policies.

More information: [www.euwareness.nl](http://www.euwareness.nl)

The EUWARENESS project is joined by:

University of Twente (project co-ordinator) - The Netherlands

Université Catholique de Louvain - Belgium

Université Francois Rabelais de Tours - France

Universitat Autònoma de Barcelona - Spain

Istituto per la Ricerca Sociale - Italy

Institut de Hautes Études en Administration Publique - Switzerland