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Analytical Framework (D4)

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Annexes:

(in separate documents)

Annex A: Requirements for development of the decision-making model and elaboration of the best practice

Annex B: Theoretical Literature Reviews

Annex C: Participation and Sustainability

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1 Watertime: aims and objectives

1.1 Urban water: a sector with challenges

Water supply and sanitation services are crucial for public health, have wide environmental impacts and provide essential services for Europe's urban citizens, as well as for Europe's industry. The development of urban water supply and sanitation systems is increasingly high on the agenda of cities in all EU member states and accession countries. In most European cities, the infrastructure needs to be renewed, requiring substantial investment; EU legislation, culminating in the Water Framework Directive and the recent Strategic Environmental Assessment Directive, is requiring new environmental and economic issues to be addressed; and the water sector is increasingly influenced by the growing role of multinational companies in the delivery of these basic services.

City decision-makers face a host of new challenges related to the organisation of water and sanitation systems, including a mix of roles for public authorities, the private sector, stakeholders, and citizens, in the management, financing, and regulation of systems. These decisions have significant long-term implications for the quality of urban life.

There is growing evidence that city decision-makers need access to practical guidance on how to implement a thorough, transparent and participatory decision-making process on these issues. Decisions may be made in favour of one organisational mode without fully considering the short and long-term consequences for consumers, taxpayers and the environment, or without testing business plans against credible options. Decisions may be made with little transparency, or with little involvement of stakeholders such as consumers, environmental associations and trade unions. There may be limited consideration of how systems can be adjusted to unforeseen social, economic or environmental impacts. In all these aspects, there may be a lack of information and exchange on the experiences of other European cities. As a result, decisions on water supply and sanitation systems may lack economic, social, environmental and technical sustainability.

1.2 Facing challenges: making good decisions

In Work Packages 4 and 5, Watertime will synthesize the lessons learned from the case studies and City in Time reports, and will produce a decision-making model and best practice guidelines designed to improve the quality of decisions on the development of water systems in European cities.

The model will focus on decisions concerning the organisation, management, regulation and financing of water and sanitation systems covering both the management of water supply and sewerage services. The decision-making model will systematize the comparison of different options on a multi-criteria basis (fiscal, economic, social, environmental, technical, legal and political). This will provide for enhanced transparency, accountability and participation in the decision-making process as well as the monitoring and review of decisions made. See *Section 5: The Analytical Framework and Watertime's Outputs* for more details.

1.3 From Analytical Framework to Watertime outputs: overall aims

In order to be able to produce the planned Watertime outputs (elaborate a set of recommended best practice guidelines for decision makers and a decision-making model), the Analytical Framework will need to ensure that at the synthesis stage, it will be possible to:

Regarding the best practice guidelines:

- Identify all positive and negative examples from the selected case studies and from the parallel 'City in Time' study;
- Integrate findings and recommended practices for decision makers with available knowledge on relevant extra-European experience (e.g. USA in matters of regulation);
- Systematise best practices for decision makers – pre- and post-decision – based on lessons learnt from the selected case studies.

Regarding the decision-making model:

- Identify factors which are critical for social, economic and environmental sustainability;
- Develop a systematic methodology for addressing these factors and assessing long-term consequences of decisions for quality of life in city;
- Frame this methodology to incorporate procedural transparency and stakeholder participation.

2 Methodological overview of the Analytical Framework

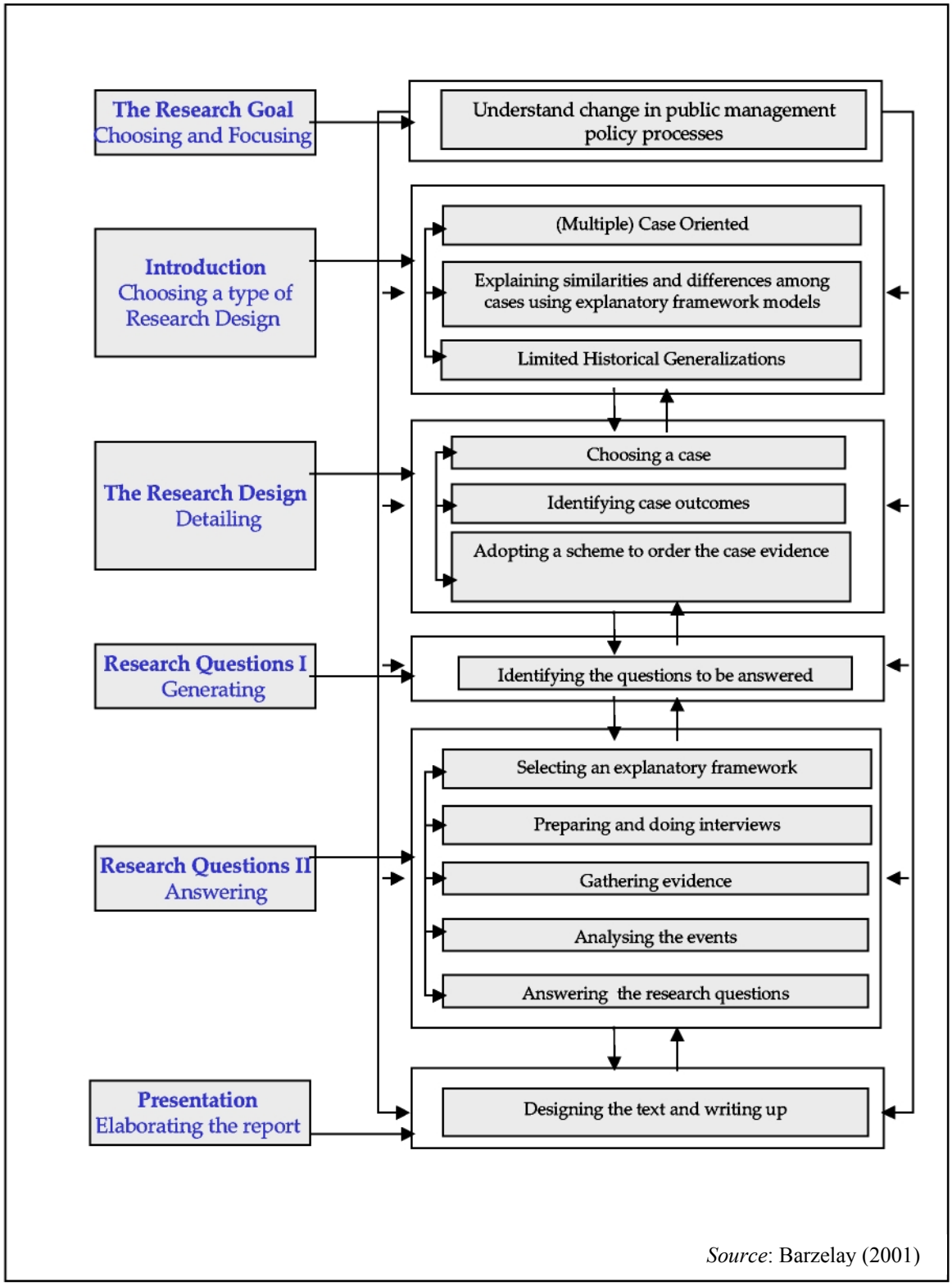
2.1 Using comparative case study methods

Comparative research examines patterns of similarities and differences across a moderate number of cases (Ragin, 1994). The cases selected are sufficiently different to require an explanation of variety. Explaining differences is useful to understand sources and limits of reforms as well as actors and factors involved.

Case-oriented studies, by their nature, are sensitive to complexity and historical specificity. Thus, they are well suited for addressing empirically defined historical outcomes, and they are often used to generate new conceptual schemes, as well. Researchers who are oriented toward specific cases do not find it difficult to maintain a meaningful connection to social and political issues because they are more concerned with actual events and processes (Ragin, 1987). In each case study we will find a case outcome or outcomes. The notion of case outcome is related to the mathematical concept of dependent variable. Researchers must recognize the case outcome, which, within Watertime project, will be related to the objective of identifying forms of organization and reforms made in the recent period regarding water and sewerage systems used in cities.

Figure below shows the comparative research scheme on public management policy change processes according to Barzelay approach. Since public management changes imply a complex decision process with different actors and factors, this framework can be used as well in our research because the object is really similar: if Barzelay research goal is to understand change in public management policy process, Watertime one focuses on the kind of changes related to the urban water cycle organisation, management regulation or financing.

The case-oriented approach has many special features: First, case-oriented methods are holistic -they treat cases as whole and not as collections of parts. Thus, the relations between the parts of a whole are understood within the context of the whole. Second, causation is understood conjuncturally. Outcomes are analyzed in terms of intersections of conditions, and it is usually assumed that any of several combinations of conditions might produce a certain outcome. These and other features of case-oriented methods make it possible for researchers to interpret case historically and make statements about the origins of important qualitative changes in specific settings (Ragin, 1987).



Case-oriented methods are used primarily to identify invariant relationships. They are used to pinpoint patterns of constant association, not to explain variation. Because of causal complexity, however, it is difficult to identify invariant relationships that are neither circular nor trivial. The way that we are going to use to explain the reform is

the narrative of the process by which the decisions that produce the change occurred (Ragin, 1987). The Watertime analytical narrative approach tries to combine historical and comparative research with decision-making models.

Through the proposed narrative structure, case studies will be analyzed establishing the chain of events that need to be explained. Some of the relevant events are selected to be analysed because of their relevance. The events initiation and termination as well as their internal dynamic are explored in a comparable way in order to allow further comparisons (Gaetani, 2002). To clearly identify and analyse the reform episodes we have to identify and designate such events and explain how they began, progressed and ended.

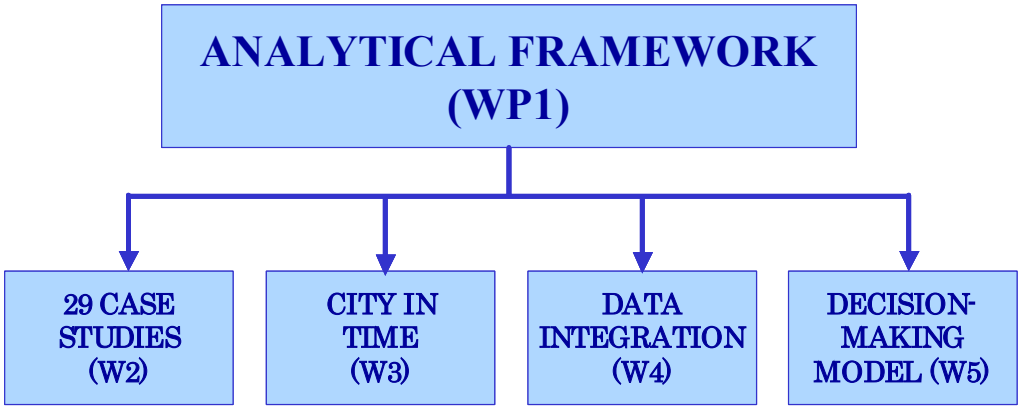
The Watertime project introduces factors and actors in this scheme of events and episodes in order to use these analysis units to better understand decision making processes on the design and organization of water systems in the selected European cities. To identify factors and actors of these decision making origins and changes, the analytical narrative approach requires a deep knowledge of the case. In fact, the narrative of analytic narratives establishes the actual and principal players, their goals, and their preferences while also illuminating the effective rules of the game, constraints, and incentives. Narrative is the story being told but as a detailed and textured account of context and process, with concern for both sequence and temporality (Levi, 2002). This means, first, extracting from the narratives the key actors, their goals, and their preferences and the effective rules that influence actors' behaviour. Second, it means elaborating the strategic interactions that produces an equilibrium that constrains some actions and facilitates others. The emphasis is on identifying the reasons for the shift from equilibrium at one point in time to a different equilibrium at a different point in time (Levi, 2002).

Comparing narratives of experiences in which decision making and reforms take place permit us to identify the key elements of these processes and will enable the research team to develop a decision making model. But the narrative provides even more than that. It is a useful tool for assessing causality in situations where temporal sequencing, particular events, and path dependence must be taken into account (Mahoney, 1999). Analytic narratives involve choosing a problem or puzzle, then building a model to explicate the logic of the explanation and to elucidate the key decision points and possibilities, and finally evaluating the model through comparative statics and the testable implications the model generates (Levi, 2002).

2.2 Role and purpose of the Analytical Framework

The purpose of the analytical framework within Watertime is to provide the framework that will be used to collect data on the case study cities and City in Time, and then to build a synthesis and derive model and best practices. The framework must take into account the subsequent needs to synthesise the data from the case studies (WP4), integrating and analysing findings to develop a decision-making model and elaborate best practice (WP5).

A sufficiently well-developed analytical framework is particularly important for multiple-case studies (sometimes referred to as comparative case studies). The aim is to ensure comparability of data across case studies at the cross-case analytical synthesis stage, without impeding the flexibility needed to do justice to each individual case study. The analytical framework must from the outset (as far as possible) be capable of dealing with the complexity and the dynamics of the phenomena being studied. It must capture the dynamic aspects linked to time[1] and to the complexities of the geographical and other context conditions. The framework has to deal with a very wide set of dimensions to place the results from each case study in a common space – and many of the important dimensions, results or conditions may only be identified during the case studies[2]. The diversity of the 29 case studies may therefore require a feedback between the case studies results and the analytical framework. One of the most important challenges of the project is to build enough flexibility into the analytical framework to enable it to be adapted to the emerging needs of the case studies without undermining its scientific rigour.



The Analytical Framework must define: (Yin, 2003)

1. the research questions – what the partners wish to learn in the course of the study;
2. the unit of analysis of the case studies;
3. the logic linking the data to the propositions

[1] One of the key dimensions of a case study is time. The relevant period to understand the key elements of the water decision-making process will depend on the real data and the results analysis. Establishing a common or homogeneous time period to compare and infer similar stages in the water decision-making history does not seem to be essential a priori.

[2] One such complexity is related to the continuous process of decision-making that has occurred in each case study. It is far from easy to define the initial conditions relevant to the decision-making process. Each country and case study will probably have a different starting date due to specific conditions in the urban water cycle and also to differing availability of relevant data. The trigger decisions and their implementation and results will vary in the different case studies, and the actors and their roles will change over time. The time dimension implies the description and analysis of the feedback between the implementation of the decision and the complex actors' actions. In some cases the structural changes will appear clearly and for example the steady state will be identified. In other cases the crisis period will probably hide this kind of fact.

In addition, the Analytical Framework will be used to develop a standard format for utilize in the case studies (D5), to ensure that the data is gathered in a consistent way coherent with the analytical framework introduce a standard format for case study reports, which will include the selected research questions, some descriptive indicators together with a list of questions and issues open and flexible, as well as data collection and representation methods to ensure tractability at the synthesis stage and to ensure the appropriate scientific methods are applied rigorously across case studies.

2.2.1 Cordoba pilot case study

One common multiple-case study methodology also employed by Watertime is that of the pilot case study – in this case, Cordoba (Spain). Note that a pilot case study is distinguished from a pre-test: a pre-test is a full 'dress rehearsal' including data collection procedures, whilst a pilot study is more formative, assisting in conceptual clarification and developing relevant lines of inquiry. (Yin 2003: 79)

The Cordoba pilot study was intended to test the draft analytical framework (D1), in particular assessing whether the framework (a) addressed the issues and aspects of importance to the decision-making process, and (b) whether it could generate the kind of models and best practice perceived as relevant by stakeholders.

Córdoba pilot case study revealed some weaknesses of the draft analytical framework (DAF) in terms of providing a clear definition of the methodological approach, focused on the analytical narratives and case studies environment. Other lessons learned from this experience are related to the data collecting methods and to the real possibilities to gather information and data as well as to the fact of the existence of capacity asymmetries. The relevant stakeholders have different levels of information management abilities and as a result the participation not only depends on the formal or legal ways but also on this capability to process and analyze information.

Process of gathering data to respond questions and issues previously defined in the DAF denoted very heterogeneous situations depending on the actor and even on the concrete events and episodes. Although some techniques used in this pilot case study has been useful (e.g. focus group) the evaluative conclusion is that some of them are probably not worthy in terms of a cost-benefit analysis. Interviews and external data collection have showed themselves as really useful tools to identify the most relevant data. Appropriate semi-structured interviews design requires a previous in deep stakeholder knowledge which permits identify clearly what can be their contribution to identify events and episodes as well as their point of view about factors and other actor's influence on outcomes.

Finally, as far as the Córdoba case is concerned, the steady state, that is, the absence of reform, is hard to define and specify, especially if we take into account the different dimensions we deal with and the participation and sustainability issues.

It is important to remember that the final analytical framework as presented here is informed by this feedback from the Cordoba pilot case study

2.3 Research questions

Watertime is about decision-making[3] in the urban water sector, its quality-of-life outcomes, and the twin principles of sustainability and participation/transparency. This involves the exploration of the causes, nature and consequences of changes in relevant decision-making processes. The twin principles, to be understood both as a means of serving the objective of "improving the quality of urban life", and as objectives in themselves, derive from the terms of reference in the EC 5th framework programme and various references in Watertime's DoW (see Annex A). The EU Water Framework Directive also puts special emphasis on information, consultation and involvement of the public, including users.

As a result, the four principal research questions of Watertime are to:

- identify the relationship, if any between the twin principles of sustainability and transparency/participation
- identify the relationship, if any, between the twin principles, and particular modes of water supply organization and the decision-making processes they entail
- identify the relationship, if any, between the twin principles and observed quality-of-life outcomes[4]
- identify the relationship, if any, between particular modes of organization and observed quality-of-life outcomes.

2.4 Object of analysis

A case study is defined as "an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident."(Yin, 2003) The object of analysis in Watertime is the urban water supply and sanitation system. The development of an understanding of the relationship between phenomenon and context is supported by papers on the International, European, and national contexts to the respective urban object of analysis. These papers are presented separately, as Watertime deliverables D7 and D10.

[3] "the essence of a case study, the central tendency among all types of case study, is that it tries to illuminate a decision or set of decisions: why they were taken, how they were implemented, and with what result." (Schramm 1971, cited in Yin (2003: 12), emphasis added by Yin). Applied to the urban water sector context, this description provides a broad prescription for the focus of interest of Watertime.

[4] i.e. the principles may themselves be scrutinised by the research e.g. by identifying circumstances where maximising participation of some stakeholders could lead to a 'better' result; or by concluding that no one set of criteria (e.g. cost to average consumer) should be the supreme consideration overriding all others.

Since decisions on water system indirectly but markedly determine how life in a city can be lived it is very important to have procedures that are transparent and participative, in the sense of involving all stakeholders in the decision-making process.

However, even if procedures are set accordingly it is still not a necessary consequence and assured that the decision made meets the requirement of sustainability in all aspects – economic, technical, environmental, social–. For that reason it is important to involve experts of different fields in order to ensure the soundness of the decision. Even that may not provide enough of a guarantee of a good decision, since decisions are made by people in a given social, cultural, economic etc. environment that varies by time, country and region.

Watertime acknowledges all the above-mentioned and has decided that the best way to overcome this problem will be to call for the help of theories that are relevant to decision-making on water systems, making best use of them for the analyses of the cases studies. We include in Annex B a review of the most relevant theories regarding this issue. The purpose of the literature reviews is not to give a concise version of the theories aimed at academics, but rather to provide an introduction in terms of how the various theories approach the problems such as decision-making in general, or organisations' behaviour in a changing economic and legal environment.

Literature reviews are an integral part of developing an interdisciplinary approach, as they help the experts from different fields to find a common understanding of the problem. It is in the nature of literature reviews that other experts from those fields may have different opinions on how those subjects should be presented, or may feel that the emphasis on some of the elements of some of the theories should have been put elsewhere, or even that other theories are more relevant to the issues under investigation.

2.5 Watertime case studies

The project is based on the exploration of 29 case studies. These case studies are expected to provide information on the interaction between a range of PESTE factors, at various levels, on the parties and processes involved in decision-making, including the constraints on decisions and objectives of decision-makers, so that models can be developed of these interactions to guide future decision-makers.

The selection of the case studies was made not by sampling on the basis of indicators at a given point in time, but rather on the basis of known examples of decision-making processes where a variety of factors, constraints and objectives could be observed. The analytical narrative approach goes beyond detailing the case to elaborate more general conditions for decision-making processes. This means there must be criteria for selection of cases other than their intellectual appeal. While the standard approaches to case selection emphasizes the bases for choice among a sample of cases which are informative about the causal chain of interest, either because of the absence, presence,

or extreme values of key variables (Van Evera 1997), the criteria used by the analytical narrative approach is closer to that of the historical one. (Levi 2002)

The cities are thus not selected as a representative sample from which statistically significant generalizations and predictions can be made – most cities in Europe have probably undergone relatively few system changes and have continued in a 'steady state', which may be the prevailing condition– although the criteria for analytical narratives also include features than make the cases amenable to modelling, providing an opportunity to get at an important process or mechanism not easily accessible through other means. (Levi 2002)

Most of the case studies, however, are cities where the steady state has been affected by some initiative or contingency – e.g. a proposal for new sewage treatment plants, or for a form of private sector operation, the switch to a different water resource– which has generated some decision-making process involving a range of factors, actors and processes.

The case studies provide an opportunity to study the elements of the decision-making process in each city. These elements are not pre-determined, even by the simple PESTE framework, and not restricted to local levels. They may include local consumer group activities, policies of development banks, regulatory decisions, municipal votes, multinational business strategies, ministerial rulings, supra-national environmental decisions, or many others. The transparency involved and the scope for participation also vary.

The whole selection process as well as the main principles which guided the process of selecting the case studies from the pool of known cities is described in detail in Annex D, together with a brief description and assessment of the relevance of the selected case studies.

2.5.1 City in Time: the long-term historical case study

A highly innovative aspect of Watertime is the integration of a long-term historical and future perspective, in the form of a more longitudinal case study tracing not just developments in recent decades, but the history of the case study city's water system from inception to present. In the context of the methodology and analytical framework presented here, City in Time (WP3) can be treated as an additional case study, with the same theories and methods applied on a different timescale. At the synthesis (WP4) stage, however, City in Time is expected to contribute additional insights from its long-term historical perspective.

City in Time will provide information on decision-making related to water and sanitation services provision and production in the case study cities approximately during the last 150 years. The most relevant major decisions will be mapped and diagnosed (examples will be given in the standard format for Case Studies and City in Time reports). The historical analysis will be carried out by applying analytical tools

such as historical research and path dependency theory (as described in the annex of theoretical literature reviews), but the focus will still be on PESTE factors.

The role of City in Time reports will be complementary to the case studies, especially in diagnosing the path dependencies, i.e. it provides the valuable background analysis and knowledge in the long-term development of water and sanitation services provision and production in the case study cities. In this sense, case studies will practically provide the mental map of "the recent present" and the City in Time will provide the mental map of "the history", i.e. City in Time reports aim at giving the analytical background and knowledge, why, how and by whom the decisions has been taken/are taken presently (during the last 10 to 20 years).

2.6 Definitions

Urban water supply and sanitation systems

Scope of the subject of study: note municipal vs. other structures, as well as integral water cycle vs. just drinking water supply or sewage systems.

Decision-making processes

In the context of Watertime, decision-making processes include modes of organization (in relation to the distribution of decision-making power, both territorially and in terms of the nature of ownership/control structures) and their internal decision structures; the relationship of these modes with local and national bodies (both directly and through the political system); and the national, European and international influences which provide the context.

Decisions (which decisions to focus on)

"The decisions analysed in the project will be the decisions on the reform of the institutional and organisational structure underlying the provision of water supply and sanitation services, including the implications that such decisions might have in terms of performance of the water undertaking implementation and monitoring (regulation)". This definition should be intended to encompass various degrees of reform and institutional/organisational change, for example varying from the decision to privatise or not privatise operations, to the decision to introduce marginal changes within the existing ownership and managerial structure, or the absence of reform at all.

Public participation

Unless otherwise stated, public participation is to be intended as popular and stakeholder participation in decision making. That is to say, public participation is intended to be the participation of individual citizens or civil society groups and other

organisations, through their representatives, in procedure contributing to decision making.

It should be noted that the above definition does not encompass public participation through elections aimed at appointing democratic representatives in central or local governments, although this form of indirect participation plays a fundamental role in decision making on urban water systems and will be considered as such.

Sustainable development:

In 1987, the World Commission on Environment and Development (WCED) defined sustainable development as the "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WWDR, 2003: 37).

3 The Analytical Framework

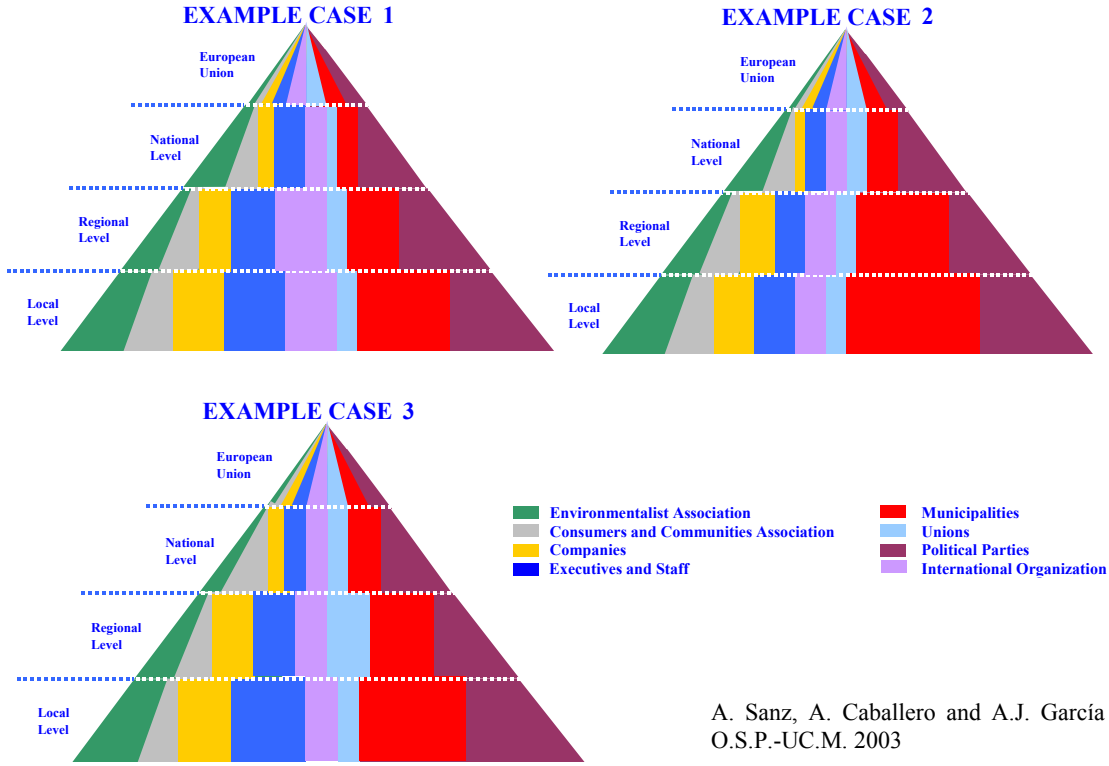
3.1 Overview

Watertime's Analytical Framework (AF) is the central part of the research design of Watertime, linking the other elements – the case studies (WP2), City in Time (WP3), and the synthesis (WP4) that will enable the production of the best practice and decision-making model (WP5). The aim is to link the body of theoretical work done so far in WP1 with the empirical studies to come (i.e. the case studies).

The AF has been developed from two sources of information: an empirical review of issues identified as relevant through the previous work of partners; and a review of theoretical approaches and analytical methods. Thus, it attempts both to maximise the possibilities of capturing all types of data identified as potentially relevant through the empirical work; and to enable the use of a range of theoretical tools for analysis and explanation.

Since water urban cycle is related to human being needs, the water system requires securing drinking water supply and wastewater treatment, although systems to provide these public services are quite different. The legal and institutional framework states the role and the competencies of different public institutions and private agents, individual or collectives. Different actors perform at each level of government and their role, status and participation vary according to the legal and institutional competences defined at each level. The influence in each case and level of the different actors is the result of more or less easily observable elements such as institutional and legal framework, natural conditions and other factors, not less important but more difficult to examine, linked to history, tradition, social fabric and participatory habits. Pictures below try to show three different cases: each colour characterizes a different actor and, as an example, four levels are represented; the surface of each agent tries to indicate its weight in the decision making process.

Thus, as we can see in the example's triangles, the relevance of political parties in the



hypothetical case 2 would be greater in the regional and local levels than in the other cases. Since the structural appearance of each case may be different a clear understanding of each context will be crucial to analyse how decision-making works.

Unions, for instance, may be a real relevant actor in a water public company, in terms of salaries, labour conditions, etc., but they may have a very low power in decision-

making at regional level regarding the water quality standards. The role and real power of these stakeholders is the result of observable and clearly defined conditions linked to the labour relations legislation. However, the history and participatory tradition can be crucial to understand their behaviour and position in water cycle.

It seems to be useful taking into account the multiple components of the urban water cycle, specifying in each case study which of them we are including in our research (see Annex F). There are some topics that are not shown throughout Annex F but that we can find in our cases studies, especially in the island cases: the desalination process. In this case, water supply is an industrial process and the technological factors usually are very relevant.

We can find a very varied combination of users and bodies responsible for provision and production, taking into account the different water uses and the cycle phases (see table on Annex F). We will need to identify those aspects in each case study in order to make them comparable, and instead of focusing on the differences, we might emphasize the present state in every city

Summarizing, the central principle of the AF is to structure the case studies at a basic level in terms of actors, factors, and events, and to organize these into higher-level structures (episodes) which provide a standardized analysis highlighting particular aspects of the case study narrative. A cross-case synthesis of these forms and the conclusions drawn from them in the context of individual case studies should then provide the basis for the kind of generalization needed to answer Watertime's research questions.

3.2 Relevant dimension of the Analytical Framework

The complexity of urban water cycle phenomena, especially when we try to capture the dynamic aspects linked to time, institutional and other context conditions, requires to deal with a very wide set of dimensions in order to place each case study in a common space state. The decision-making analysis in this field related to the Watertime objectives can be faced using the following key dimensions:

- Actors
- Factors
- Participation
- Time

From the view of social network analysis, the social environment can be expressed as patterns or regularities in relationships among these interacting units. In fact, social life could be seen as interactions among adaptive agents who influence one another in response to the influence they receive. (Michael W., Macy, and Robert Willer, 2002)

3.2.1 Actors

Actors are discrete individual, corporate, or collective social units. However, actors and their actions are viewed as interdependent rather than independent, autonomous units. Some examples of actors are people in a group, departments within a corporation, public service agencies in a city, or nation-states in the world system. (Wasserman and Faust, 1994)

The urban water cycle involves a wide and diverse set of actors covering the various water uses (agriculture, drinking water, industry, tourism, fishing, etc.), government levels (EU, national, regional and local), and different agents (professional organisations, civil servants, trade unions, neighbours and consumers associations, environmental groups, political parties, institutional bodies, contractors, suppliers, private water companies, regulators, non profit organizations, etc.) However, the dynamic approach requires taking into account not only the present state but also how different levels of government interact in this field and how actors that we find in each level can also be diverse and their roles and power can vary.

We must deal with at least the following topics:

a. Identify the key actors in the decision-making process
b. Their interest and interest-seeking behaviour
c. The variables which determine their level of satisfaction
d. Their decision rules
e. Their relations with each other and the past, present and anticipated conflicts over the water cycle

Then, regarding each case study, we can classify actors in three groups:

1. Internal actors
2. External actors
3. Individual

Internal actors have a role and a status in the decision-making process. The cause of their participation and competences are very diverse. For example, legislation can establishes that the city council must approve the water public company investment plan, or if a public company is responsible for the water supply or sewage treatment, the internal actors can be the manager, the staff of the company, the trade unions that operate in this company and also the members of the city council responsible for this area. Following this case, the internal actors take, in legal and real terms, the decisions of the company but they are constrained by frame conditions influenced itself by other actors. For instance, the river basin authorities in some cases have a great influence in very important aspects such as the price of water before treatment. Also the regional government can be responsible for the water quality legislation and the internal actors must take it into account.

External actors do not have a specific and clearly defined role in the decision-making process but they have a very important influence, usually establishing the

conditions or constraints within which the internal actor can carry out the decision-making. In one case study a specific actor can be internal and in another one, external; for example, the neighbour association mostly acts as an external actor. Despite the fact they do not have a specific role in the decision-making process, the decision makers must take into account their opinions: in some cities, neighbour associations have representatives in the water public company board of directors, acting as an internal actor.

There are other actors that are not organized and act as an *individual*, such as the final user. An early identification of a wide set of actors and their characteristics allows to select the most relevant actors related to the water decision making in each case of study. In this sense, the first way to approach questions such as of governance in the water field is to identify the actors and institutions that are involved, and to characterise them. The second element considering the governance of water supplies is to identify the relationships between organizations involved in the production of water policy in terms of the changing boundaries of responsibility that parallel the processes of privatisation, marketisation, liberalisation and to examine the legislation and policy documents in search of discourse coalitions and identifiable networks.

The first way to approach questions of governance is to identify the character of the actors involved in water management, and to characterise them. Thus, for analysis purpose, we could define the following preset categories of actors, which will be obviously different depending on the case context:

Level	Actor	Role in water cycle
National level	Central Government	Competences regarding legislation, arrangement and concession of resources and hydraulic exploitation. Design of the hydrological planning and grants for financing.
	Water National Council	Superior consultative body regarding water issues, in which the Administration of the State and of the Regions, the River Basin Institutions as well as professional, economic, ecological and social organizations are represented. Report on the project of the National Hydrological Planning
	Ministry of Environment	Setting environmental regulations
	National Environment Agency	Independent scientific institution advising the state government on water policy.
	Ministry of Health	Drafting legislation for implementing regulations relating to health
	Ministry of Economy or/and Finance	National economic policy, water pricing, liberalisation, etc.

Level	Actor	Role in water cycle
	Ministry of Agriculture	Agricultural uses
	Ministry of Works	Major infrastructure construction
	Water working group of the Federal States or Autonomous Regions	Inter-ministerial discussion group to co-ordinate water policies
	National Federation of Cities and Municipalities	Lobby group which represents cities associated with rural districts in negotiation with other tiers of Government
	NGO's	International and national NGO's with lobbying at EU level. Consulting pressure groups
	Public Services Union	Represents employees of public water companies. Opposes privatisation and deregulation
Regional level	Regional Government	Competences on legislative development, execution and control. Establishment of additional protection rules
	River Basin Institutions[5]	Devise, monitor and review of the River Basin Planning; administration and control of the public hydraulic authority; administration and control of the general interest exploitations; and project, construction and exploitation of own works or entrusted by State agreement, or by the CC.AA. or the Town Halls. Some of its attributions are granting of authorizations and concessions relating to the public hydraulic authority, as well as the inspection and monitoring of granted conditions performance.
	Manufacturers and farmers through Irrigators' Associations	Pressure groups
	Technical consultancies	Consulting
Urban level	Municipalities or City Councils	Operation and maintenance. Management of the water supply, collectors and wastewater treatment
	Association of the Municipalities	Co-ordinates water supply and environmental protection
	Private companies	e.g. operation of abstractions and treatment plants
	Local communities	Pressure groups

[5] in case of intercommunity basins they depend administratively on the Ministry of Environment and in case of community basins they depend on the respective Autonomous Community

Level	Actor	Role in water cycle
	Citizens initiatives	e.g. campaigns to reduce wastewater fees and industrial abstraction

3.2.2 Factors

It is important to establish the theoretical boundaries of this project, as these provide the framework of the analysis. Any event can be analysed according to the PESTE framework, a classic subject checklist which constitute the traditional approach for monitoring external trends and shocks: Political factors, Economic factors, Social factors, Technological factors, and Environmental factors (see e.g. Meristö 1991).

Factors are not only found at the city level. Decision-making is the result of multilevel elements interacting (European Union, national, regional and local level). The PESTE framework provides a five major categories of external factors base where place our case studies and analyse them in a common approach.

This dimension tries to identify factors which are critical for the sustainability conditions which operate in each case study influencing and constraining somehow the decision-making process. These factors vary over time and throughout the selected cases. However, some general issues to be covered have been identified by using the partner's expertise to recognize a broad set of issues that arise in the case studies as well as in other cities on the basis of existing knowledge:

Factors	Sets of issues
Political and institutional	- Interest groups, policy networks and state autonomy - Process by which options are put forward/Range of options being considered - Range of options considered and final decision - Assessment of the level of institutional openness - Political sustainability
Economic	- Strategy - Efficiency - Outcomes (e.g. pricing, investment) - Regulation - Economic sustainability
Social	- Inclusiveness in reform process (e.g. community support to goals of reform) - Equitability and access to service - Redistributive effect of reform - Social sustainability - External cooperation

Technical	- Objectives - Service quality and performance - Constraints to adoption of technology - Implications of technology adopted (short term) - Adaptability of technology adopted (long term implications)
Environmental	- Operational strategy and the environment - Water demand management and conservation - Environmental impact of operations (e.g. quality of water in rivers and lakes, pollution incidents) - Technology and environmental externalities - Environmental sustainability

The most effective way in which this analysis can be used is asking the following questions about the information provided:

- Which of these influencing factors are the most important at the present time in each case study?
- Which are likely to be the most important in the future?
- What are the key drivers of change in the selected cases?

From the answers to these questions, it is possible to isolate a number of key influences for the future which could highlight some findings and issues for further exploration.[6]

3.2.3 Participation

Public participation is a precondition to democracy, as this has developed in western societies, and has thus been particularly studied by political scientists (Held, 1987 & 1995; Pasquino, 1996). The concept itself of democracy as a form of government - whereby supreme power is exercised by citizens directly or indirectly through a system of representation usually involving free elections[i] - presupposes the existence of public participation in various forms and degrees of intensity. Direct democracy, whereby citizens directly exert power, is a form of democratic government whereby public participation coincides with the transposition of public opinion into governmental action, both in terms of policy and decision making. Direct democracy is associated with a number of practical difficulties, most notably due to the size of modern nation-states and the complexity of the issues to be addressed in modern societies, which discourage its adoption as a universal model of government. Representative democracy, whereby citizens indirectly exert power through elected representatives, can be seen as representing a solution to the mentioned practical difficulties. Representative democracy implies public participation in the form of free elections, whereby entitled citizens express their preference on the candidates to govern the whole state and therefore implement policy and/or decision making, as well as the freedom to take individual or collective action aimed at influencing public opinion and orienting/affecting the action of elected representatives (e.g. demonstrations, petitions, referenda, resort to other branches of government such as the judiciary).

[6] According to East Sussex City Council. *East Sussex City Council Plan 2002/2003*

In recent years, representative democracy has undergone a severe crisis due to the increasing complexity of the issues governments were called to address, a perceived failure to effectively represent the interests of broad parts of society and to the increasing apathy of citizens which appear less and less inclined to participate through elections. Globalisation has certainly contributed to the increasing complexity of the issues to be solved, for example with the emergence of a new set of environmental issues, their prominence on the public agenda and the underlying conflicts between the interests carried by multiple sections of a new fragmented civil society. In this context, deliberative democracy has increasingly been regarded as a mechanism complementary to representative democracy and able to overcome the latter's pitfalls, by allowing for citizen empowerment through inclusiveness of multiple social actors in the decision making process and the careful consideration and discussion of competing reasons (Pimbert & Wakeford, 2001: 23). Deliberative democracy takes place through social interaction among citizens interested, either on their personal capacity or as representative of social actors, on the specific issues debated which concern society, the economy and environment in a given community. Examples of fora for inclusive deliberation are citizen juries, scenario workshops and other participatory methods such as focus groups, public meetings, community groups, special thematic days, consensus conferences, advisory committees and participatory integrated assessment (IA) focus groups.

The concept of deliberative democracy is very closely linked to that of public participation, which on turn encompasses those of popular participation and stakeholder participation, that is to say the participation of An institution, organisation, or group with an interest in the decision making process affecting a particular sector or system[ii]. Despite the difference between popular participation and stakeholder participation, the World Bank in its Participation Sourcebook preferred focusing on the concept of stakeholder participation as a preferred vehicle for delivering its pro-poor agenda, on the assumption that key stakeholders able to affect the outcome of a given policy had to be involved to ensure the success of that policy and that this would lead to more satisfactory outcomes than merely focusing on popular participation (World Bank, 1996). It remains to be seen whether such a selective approach is the most suitable to serve our purposes.

Public participation has been seen as a mechanism ideally enhancing collective and individual empowerment, together with democratic accountability, in decision making on environmental services and sustainable development. In order to further the above objectives we shall adopt a definition of public participation broad enough to encompass stakeholder and popular participation, as well as participation by individual citizens, through ad hoc mechanisms aimed at contributing to the decision making process. This appears to be in line with the content of a number of international declarations and legal instruments on public participation in decision making on environmental issues and water services (see Annex below), which do not explicitly restrict participation to the narrow concept of stakeholder participation.

It should be noted that the above definition does not encompass spontaneous action taken by individuals and/or groups, for example through demonstrations, petitions, etc. In fact, such spontaneous actions represent a different form of participation, antithetical to that taking place in an institutional context, due to its own "spontaneous" and episodic nature which makes it difficult to evaluate with the same criteria used for public participation through periodic stakeholder consultation or continuous stakeholder representation in a decision making body. This is not to say that spontaneous collective or individual actions have no place in decision making, but rather that we might consider them when applicable in relation to the responsiveness of existing decision making structures to the legitimate concerns voiced in whatever form by the local community. This is obviously more inherent in the domain of sustainability of a given system and the underlying decision making process rather than institutionalised procedures regulating the "production" of inputs in the decision making process.

It should also be noted that the above definition, based more on the concept of deliberative democracy rather than the traditional concept of representative democracy, does not encompass indirect participation through elected representatives. In fact, elected representatives are called to represent the public interest of a community as a whole rather than the interests of specific sections of civil society alone, which makes indirect public participation through elected representatives difficult to evaluate with the same criteria used for deliberative democracy. Furthermore, with representative democracy being firmly established as a form of government in all the countries observed under WaterTime, the issue is not participation through elections but rather the contribution made by elected representatives to the sustainability of the local water system, to be scrutinised as a political and institutional factor within the PESTE range.

3.2.3.1 Evaluating public participation

Public participation in environmentally-related decision making has been evaluated in the light of acceptance criteria and process criteria, whereby acceptance criteria include the representativeness of participants, influence participants have on decision making and overall transparency of the process (R. Mohana, 2001). Acceptance criteria appear as fundamental elements to be considered when evaluated but are not exhaustive as fail to address the outcome of participation, for example in terms of improved decision making and enhanced sustainability. For the purposes of the WaterTime project, acceptance criteria will thus have to be integrated with other criteria allowing for evaluation, not only of the procedural aspects but also of the effectiveness of the participatory process.

As suggested by Burns et al. (1994, as referred to in McLaverty, 1999: 28), any evaluative model of public participation should distinguish between participation and control. As the objective of WaterTime is not to evaluate participation per se but rather to evaluate it in the light of its contribution to the sustainability of decision making and thus of urban water systems, it is suggested that the evaluative model of public participation elaborated for WaterTime should go beyond the above distinction. More precisely, the proposed evaluative model will not only incorporate both the

notion of participation (intended as the various forms and levels in which public participation takes place) and control, but also consider the contribution of public participation to enhancing sustainability as defined above and explained in more detail below. This requires distinguishing between two attributes of public participation: voice and outcome. Voice can be defined as the ability of the public (in terms of individual citizens or stakeholder groups) to effectively represent their views and concerns to key decision makers (water operators and/or local authorities). Such definition relies on the fact that participation is described not only for its inclusiveness and representativeness but also for the degree of proximity to the ultimate source of decision making power and thus the degree of control over the decision making process. The notion of outcome requires the evaluation of the impact produced by various forms of public participation on the ability of the urban water system to enhance sustainability and quality of life through decision making.

In order to assess the "voice" of various forms of public participation, it is necessary to identify the main characteristics of participation (how participation takes place) and how participants relate to power. We will do so by gathering information through a limited number of questions, designed to allow us to locate public participation as observed in any of the case studies on a predefined scale of "participatoriness" (to be intended as the degree of proximity to the ultimate source of decision making power and involvement in the decision making process). It should be noted that information gathered through the general questions will at the same time contribute to shed light on the outcome of public participation or, in other words, the interrelation between participation and sustainability.

Key aspects of public participation to assess include the following:

1. The enabling environment;
2. Participation in decision making;
3. Monitoring of implementation.

The enabling environment is represented by all the institutional and legal rules and other factors (e.g. social and economic factors) that enable public participation to take place. For our purposes, we have simplistically identified access to information as representing the enabling environment. Although access to information is certainly an important precondition to public participation, other factors such as the participative culture of local civil society might also be relevant. This and other such factors might be included in the scope of question 30), Annex C. Evaluating the public's access to information requires answering the following questions:

1a. What information is accessible by the public?
1b. What are the costs of/barriers to access to information?
1c. Who can access the information?

Question 1a aims at identifying what sort of information is accessible by the public, so that civil society (citizens or stakeholder representatives) might participate in an informed way in decision making on the reform of water supply and sanitation

systems. Question 2b addresses the possible economic or institutional costs of accessing relevant information, or any other barriers (e.g. legal rules barring or limiting access, confidentiality clauses, etc) affecting the public's ability to adequately inform its participation. The costs of accessing information might include the costs for civil society to acquire the necessary technical expertise (e.g. legal, accounting or engineering) to assess the information once it obtains access to it, which might involve resorting to the services of consultants and professionals. Finally, questions 1c identifies who, if any individual member of the public or organisation, enjoys access to information, in order to determine the actors who are in a position to participate and how this might affect policy networks.

Evaluating public participation in decision making requires considering the following:

2a. Who participates?
2b. How do they participate?
2c. Who decides who participates?

While question 2a is correlated with question 1c, question 2b aims at identifying the forms in which public participation takes place in the local context. Conversely, question 2c complements question 2a in that it refers to further factors which might affect participation, such as when this is subject to a prior selection or co-optation by public authorities.

Monitoring of the implementation of decision is crucial to ensuring that their realisation contributes to the intended objectives of decision making in terms of sustainability of water systems and quality of life (in this sense, see *4.2.4 Participation* and its revision as suggested in "Revising the DAF after Madrid", pp. 5-6). Evaluating public participation in relation to the monitoring of decisions being implemented requires considering the following:

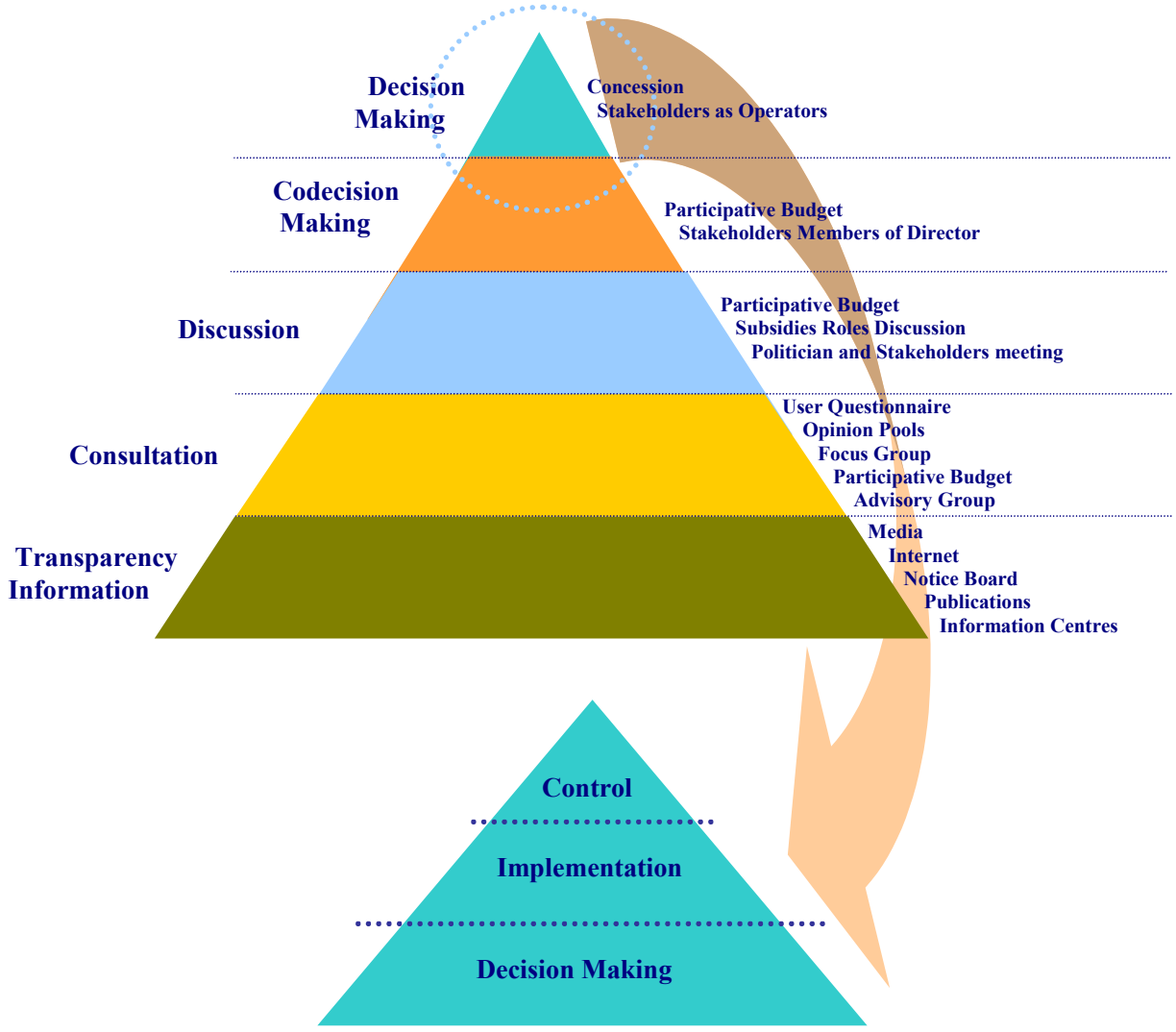
3a. Who monitors?
3b. How transparent is the monitoring project?
3c. What remedies are available for the public against unsatisfactory outcomes?

Question 3a aims at assessing whether and to what extent there is public participation in the monitoring process; for example, whether civil society is involved in monitoring water operations either directly or by means of consultations with a regulatory agency. Question 3b relates to the transparency of the monitoring process as a means of allowing a more informed and effective public participation, while question 3c investigates the existence and nature of procedures of last resort for public action rather than participation, which might play the role of guarantees for the protection of public interests.

The below figure represents a scale of scale of proximity to power and inclusiveness in the decision making process, going from the mere access to information up to forms of co-decision making (e.g. participative budget or stakeholder involvement in decision making bodies internal to the operator, such as in the case of stakeholder

representation within the company's Board of Directors) or when stakeholders themselves become decision makers due to their role as operator. It should be noted that the same system of participation may contain more than one element characterising its degree of proximity, as is for example clear in the case of the participative budget which contains an element of both discussion and co-decision making. Also, information will be a precondition of any form of participation irrespective of their degree of proximity. Finally, the below pyramid of participation can be used to evaluate the degree of proximity and inclusiveness not only for the decision making process, strictly defined as the process leading to the adoption of decisions, but also for other phases such as those of implementation of the adopted decisions and monitoring of implementation.

Figure 1: A scale of proximity to power and inclusiveness in decision making



In order to assess the "outcome" of various forms of public participation, it is necessary to identify a limited number of categories defining public participation in terms of "voice" or proximity to power and inclusiveness in decision making so that these can

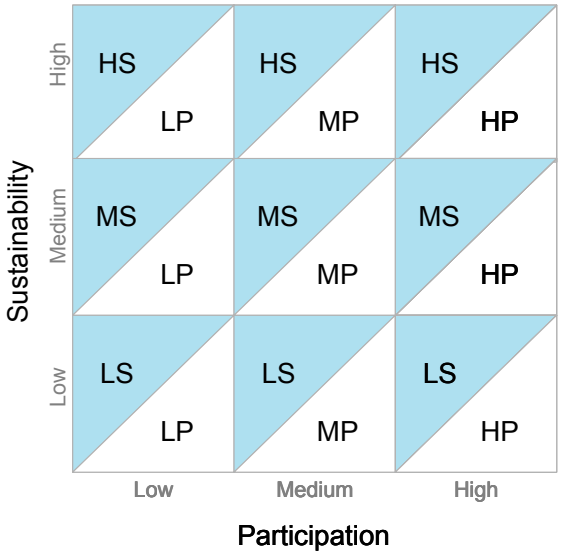
be associated with different categories of outcomes in terms of sustainability of decisions made. The result of the association will be a matrix identifying a number of combinations between different levels of participation and different levels of ensuing sustainability, which will provide researchers with a useful tool to: categorise findings from any of the case studies; synthetize findings obtained from individual case studies into generalised findings assuming the form of best practices and applicable to the proposed decision making model; and infer conclusions on how such findings relate to the existing theory on public participation and sustainability.

Section X below defines the three increasing degrees of sustainability which will be used to evaluate the outcome of participation in function of its degree of proximity. On the basis of the information gathered through the above 9 questions and elaborated by using the above scale of proximity and inclusiveness, it is possible to identify the following three degrees of participation in terms of voice.

- **First degree of public participation (Low Participation or LP)** - there is no or limited opportunity for public participation (e.g. limited to access to partial information controlled by operator);
- **Second degree of public participation (Moderate Participation or MP)** – there are opportunities for participation but voice in terms of scope for effectively contributing to decision making is limited by procedure or other constraints, resulting in less than satisfactory proximity to power (e.g. mere consultation of civil society groups with major stakeholders without adequate control over decision making process, or discussion with no possibility for "enforcing" decisions adopted);
- **Third degree of public participation** (High Participation or HP) - there are opportunities for public participation with substantial voice and inclusiveness in decision making (e.g. participative budget, civil society representatives as members of Board of Directors).

Figure 2 below shows the participation/sustainability matrix, which contains 9 possible combinations of outcomes in terms of sustainability and participation in terms of voice or proximity. The matrix suggests that higher levels of voice do not necessarily lead to satisfactory outcomes in terms of sustainability, much depending on the other institutional and social intervening variables which affect the translation of participation into decisions, while sustainability can even be achieved with relatively low levels of public participation. The matrix aims at better addressing the complexity of participation as a social and political process conditioned by multiple internal and external factors, such as for example legislation introduced by central government.

Figure 2: Participation/Sustainability Matrix



As regards the outcome of participatory processes, Beirle (1998) argues that public participation should ideally achieve six social goals – educating and informing the public, incorporating public values into decision-making, improving the substantive quality of decisions, increasing trust in institutions, reducing conflict, and achieving cost-effectiveness. For the purposes of WaterTime, it appears advisable to focus on the goal of enhancing the quality of decision making and sustainability, while the other five objectives will be evaluated as a function of the former. In other words, the other five goals will be considered if and to the extent in which they affect the achievement of improved decision making and enhanced sustainability.

Finally, in order to aim at completeness it remains to explain the motivations of key actors in determining the position of participatory processes observed in any of the case studies within the 9 possible combinations indicated by the matrix. This is possible by identifying the following four determinants, whereby the first two relate to the participants (either stakeholder groups or individual citizens) and the last two to the motivations of authorities or other key actors (either at central or local level) which define the rules governing the participation process or have the resources to otherwise control it. On turn, the four determinants will depend on relevant political and institutional structures, ownership and management of water operations, and/or other PESTE factors:

a) there is little or no demand for public participation (e.g. there is no perception of a problem to be solved through participation, there is no problem, or there is a problem but participation is seen as no solution);
b) there is demand for public participation from beneath but this is resisted (e.g. in order to retain a privileged position in terms of political power or other resources);

c) public participation is granted from above, but with limited voice and proximity (e.g. in order to limit its effects);
d) public participation is granted from above, with considerable voice and inclusiveness (e.g. due to political ideals or other considerations).

It is emphasised that the above determinants – a), b), c), and d) - do not represent categories of public participation but factors to be considered in explaining the cause of different outcomes associated to different levels of participation; that is to say, in establishing the logical correlation between varying degrees of public participation (LP, MP, HP) and varying degrees of sustainability (LS, MS, HS) in the combinations identified by the matrix above.[7]

Watertime will use the analytical narrative[8] to research public participation in every case in order to understand factors (political, environmental, social, technical and economical) and actors in the decision making process. The analytical narrative must be considered a good method to know what happened, what happens and maybe, what could happen in the future considering the PESTE factors, the actors and the city in the time in relation with public participation and sustainability in the decision making.

3.2.3.2 Elaborating on the definition of sustainability

As noted in section 2.6 Definitions above, in 1987 WCED defined sustainable development as the "development that meets the needs of the present without compromising the ability of future generations to meet their own needs". To date this remains possibly the most popular definition of sustainable development. Nonetheless, there is still a considerable amount of uncertainty among practitioners about the exact meaning of sustainable water development, so that the concept requires further explanations.

The following definitions might contribute to understanding the concept of sustainability[9]:

A. "Sustainable means using methods, systems and materials that won't deplete resources or harm natural cycles"
B. Sustainability "identifies a concept and attitude in development that looks at a site's natural land, water, and energy resources as integral aspects of the development"
C. "Sustainability integrates natural systems with human patterns and celebrates continuity, uniqueness and place-making".

The 2003 UN World Water Development Report commented the WCED of sustainable development as follows: "A key factor in the elaboration of sustainable development is the

[7] O'Riordan and Voisey, 1998, 3, 16. quoted by Ante Elisabeth Töller in EMAS' research project
[8] Watertimes's analytical framework describes it in detail. Anyway, it should be noticed the importance of the concepts events and episodes as tools to analyze and show any case considering factors, actors, levels of government and time dimension in relation with public participation.
[9] Quoted by Michael Mahaffy, 2000. Computer Systems Professional, School of Architecture, Washington State University.

integral view taken of the central concept: that the interests of people, society, economy and environment need to be seen as an interconnected whole and trade-offs respecting all interests need to be made. Economic development has to be viable from a social and environmental point of view, social development has to be viable in the light of economy, and environment and environmental policies have to be attuned to social and economic development. The trade-offs are ultimately a societal and political choice" (WWDR, 2003: 37).

In the light of the above, we can identify the following as fundamental aspects of sustainability – continuity, virtuousness and plurality, whereby the three are to be viewed as interrelated and interdependent. Plurality represents the different dimensions of sustainability, which can be possibly identified along the PESTE typology of factors. It is in this sense that many observers believe that participatory democracy, with its representation of different interests within civil society, is a prerequisite for achieving sustainable development[10].

The notions of continuity, virtuousness and plurality might help distinguish sustainability from other concepts which it presupposes, such as that of durability. Durability can in fact be defined as the ability of a process (e.g. a productive cycle such as the urban water and wastewater cycle) to maintain its fundamental characteristics while it reproduces itself along time. In other words, durability represents the mere ability of a process to last throughout time. This concept is distinct from that of sustainability in that it does not necessarily imply virtuousness and plurality. In other words, the idea of durability might imply that a system of delivering water services to a given community shows resilience to change irrespective of the social and/or environmental damages caused.

Sustainability can be defined as the ability of a process (e.g. a productive cycle such as the urban water and wastewater cycle) to maintain its fundamental characteristics while it reproduces itself along time, without harming the local community (people and environment). By taking into account the various PESTE factors, sustainable water management and/or development might be identified as follows.

Political sustainability is the ability of a process to reproduce itself without generating political or institutional shocks. Economic sustainability is the ability of a process to reproduce itself without generating adversely affecting the local economy either at micro or macro levels. Social sustainability is the ability of a process to reproduce itself without damaging the social fabric. Technical/technological sustainability is the ability of a process to reproduce itself without causing negative path dependence effects. Environmental sustainability is the ability of a process to reproduce itself without harming the environment (at local level, but the concept can be easily extended to encompass upstream and downstream environmental consequences).

[10] Mintzer, 1992. Quoted in www.gdrc.org

3.2.3.3 Categorising sustainable water management/development

The Watertime project has adopted sustainable water management and development as its overarching normative dimension, that is to say the objective it aims at promoting and that it is presumed should inform decision making and public participation in the urban water sector. It is thus necessary to classify sustainability in a limited number of broad categories, general enough to encompass a wide spectrum of empirical experiences while allowing for distinguishing among various degrees of sustainability. More precisely, it is proposed to adopt three types characterised by increasing degrees of sustainability, in terms of continuity, virtuousness and plurality:

The first degree is that of Low Sustainability (LS): this type is characterised by low durability, in the light of the extremely adverse effects produced by the process in question. Such effects might be so negative that the pressure exerted on the system will lead to its cessation or fundamental alteration in the short or medium term. For example, price increases imposed by a water operator might be so untenable that civil unrest lead to the cancellation of the concession within few months from its award. In this case, the lack of virtuousness and plurality adversely affects continuity of the system.

The second degree is that of Modest Sustainability (MS): this type might be characterised by some degree of durability, despite the high costs in terms of one or more of the PESTE dimensions which the local community has to suffer. In this case, one or more factors allow for the continuity of the system despite low virtuousness and plurality. Factors allowing for continuity might include power and resources of certain actors, and their networking in the pursuit of their interests, and/or external factors of economic and institutional nature. The fact that the system is characterised by continuity does not exclude that, in the future, the lack of virtuousness or plurality lead to the crisi of the system and its cessation.

The third degree is that of High Sustainability (HS): this type is characterised by enhanced sustainability, in the light of the ability of the local system to promote its own development without generating adverse effects at political/institutional, economic, social, technical and environmental levels. In other words, the continuity, virtuousness and plurality of the system are mutually reinforcing.

The above categorisation of sustainability might be applied to the Participation/Sustainability matrix.

3.2.4 Time

The aim of the case studies is not to paint a static picture of the governance of the water cycle at any given point in time. Instead, the aim is to construct a mental film of how actors (individual and institutional) and factors (analysed via the PESTE framework) have over time contributed to specific decisions. A highly innovative aspect of the research study is the integration of a long-term historical and future perspective into the case study. If decision-makers have to assess and forecast future

alternatives and identify preferable development paths, it is essential to undertake a proper knowledge-based analysis of the present and the past.

Time dimension will specifically seek to address the following questions:

- what were the strategic decisions that have mostly affected the development path (binding, limiting, postponing)?
- who and what factors define and create the demand for services?
- how does the historical context constrain potential best practices for the future?
- what limits do technical choices taken in the past impose on decision-making?
- on what basis have selected strategies been formulated and decided throughout different time periods?
- how has the role of public private partnership (PPP) changed over the years and how is it likely to change in the future?

The City in Time work package must deal at least with the following issues in order to analyse past and future decision-making:

a) Limiting factors and future scenarios
b) Changing actors, relations, and interests
c) Dynamic effects of actions, decisions, and interests

These points should include in the expected deliverables the following data:

- dates and sequence of key decisions on systems, showed in each case study episode events' table e.g. special public bodies setting-up, shift of responsibilities to local or central government, changes on systems ownership between private sector, national and local governments; operators structural changes between sectors; changes in pricing and charging methods; introduction of water rights;
- local and national (and international) past decisions, which constrain and limit present choices e.g. connection of bulk water supply sources; boundaries of administrative units; taxation and borrowing powers of local governments;
- factors and interest groups involved in the past e.g. emergence of public health issues; origins of private sector role; environmental issues and local traditions; economic development; reorganization of former communist regimes and eastern European countries reaction.

It is not easy to define the initial conditions relevant to the decision-making process. Each country and case study will probably have a different starting date due to specific conditions in the urban water cycle and to the different availability of relevant data. The trigger decisions and their implementation and results will vary in the different case studies, and the actors and their roles will change over time. Time dimension implies the description and analysis through the analytical narratives of the relationship between decision implementation and the complex actors' actions, and

through a parallel 'City in Time' analysis, it relates findings to the historical context of water development in the cities, and in Europe generally.

City in Time will provide information on decision-making related to water and sanitation services provision and production in the case study cities approximately during the last 150 years. The most relevant major decisions will be mapped and diagnosed (examples will be given in the standard format for Case Studies and City in Time reports). The historical analysis will be carried out by applying analytical tools such as historical research (as described in the annex of theoretical literature reviews) and path dependency theory, but the focus will still be on PESTE factors.

The role of City in Time reports will be complementary to the case studies, especially in diagnosing the path dependencies, i.e. it provides the valuable background analysis and knowledge in the long-term development of water and sanitation services provision and production in the case study cities. In this sense, case studies will practically provide the mental map of "the present" and the City in Time will provide the mental map of "the history", i.e. City in Time reports aim at giving the analytical background and knowledge, why, how and by whom the decisions has been taken/are taken presently (during the last 10-15 years)

One way of developing City in Time within Watertime context is to start from the analysis of the 29 case studies carried out at horizontal level and the resulting generalisations. Before turning this generalisations into best practices (or worst practices), it would be sensible to cross-check them with the generalised findings obtained from the historical analysis (the vertical level) in order to strengthen the soundness and predictability of the best practices which Watertime will eventually offer to stakeholders. It is in fact reasonable to expect historical analysis to provide a privileged perspective on the path dependency of decisions on the reform of water supply and sanitation systems, allowing the projection of historical lessons into the present and the future. As a result, the first analytical approach when Watertime meets City in Time is retrospective-prospective.

A second phase in the use of the time dimension is represented by the prospective-retrospective approach characteristic of futures studies. When the generalised findings obtained from the horizontal analysis of the case studies and the historical analysis are projected into the future, we might automatically infer what course of action is preferable retrospectively (that is to say, in the present) in order to achieve a desirable objective. Similarly, future studies, like many other if not all of the selected theories, and all the generalised findings obtained from analysis at a horizontal and vertical level, will inform the construction of the model. Thus, usage of the model will again produce a prospective-retrospective logical process. However, it should be emphasised that the two approaches described above – retrospective-prospective and prospective-retrospective – are closely intertwined and should not be seen as insulated one from another.

3.3 Analytical methodology

The Watertime study objective is to identify forms of organization and the reforms made in the recent period to infer a model of decision making that could help decision makers and stakeholders to enhance the quality of life in the cities.

The research goal is to understand the reforms episodes that occurred in the cases of study and to enable to compare between in order to obtain a decision making model. Comparing narratives of experiences in which decision making and reforms take place permit us to identify the key elements of these processes and the actors and factors role in them.

Each narrative reflects the use of similar models of experiences and similar theories of theories of human, organizational and governmental behaviour. The theoretical approaches included in the literature review must be used in those narratives. Such similarity makes the narratives comparable. Comparable narratives are the basis of insights into the process of public management policy change, considered as a historical phenomenon. It can be judged whether any proposition put forward is plausible or convincing, provided the methods by which such propositions were attained are clearly understood.(Barzelay, 2002)

The case evidence is ordered basing on the analytic scheme, following a map of analytical-defined events which characterize the reform episode (all these analytical concepts will be explained deeper in the following sections). The cases are sufficiently different from one to another to require an explanation of variety, making best use of these differences to understanding the sources and limits of reforms as well as the relevance of the actors and factors involved and their roles in the whole process.

3.3.1 Formal knowledge about the decision making process in each case study

In each case study we will find a case outcome or outcomes. The concept case outcome is related to the mathematical concept of dependent variable[11]. The case studies researcher must identify the case outcome that obviously is related to the Watertime objective of identify the forms of organization and the reforms made in the recent period. The case studies have been chosen taken into account the objectives and the wide variety of concrete experiences that we can find in the European cities. That is why the case outcome can be very varied and the period relevant also. In some cases the case study will be the privatisation process that produces as outcome the change in

[11] For example in Gaetani (2002) "The case outcomes of the recent Brazilian state reform included a new package of public management policies. Some policies were introduced through the approval of a constitutional amendment and others through ordinary legislation. The first group included provisions that enabled new forms of public sector organization and the adoption of different employment regimes within the public sector. The second group included a new procurement policy, the creation of quangos and agencies, and a new human resources policy. Both groups were results of the same array of parallel and serial events – public management policy making and decision-making processes within the executive. However, the second group depended on a negotiation process between the executive and the legislative within the Congress in order to have the constitutional amendment approved".

the form of organization and in other can be the fact of setting participatory mechanisms in the decision making that implies in a certain way a relevant change in the organization form. The case outcomes must be explained in a rigorous and common way. (Barzelay, 2001)[12]

As we said above one of the Watertime topics are the reforms made in the recent period. The reform is conceptualised in Watertime as a structural change in the organization forms that affect the actor's role and the factors in the future especially in terms of sustainability and participation. As a result the reform should be instances of decisions making in the past that affect the political, economical, social, technological, environmental circumstances in the present and in the future. The actor's role and their interrelationships can change totally or partially in the reform process. These changes as a result of a previous decision making can be consistent with the actor's initial intentions or different to then and even opposite to the decision makers' goals. In some cases the reform decision making process it is not able to produce any significant or relevant change in terms of the reform concept that we indicate above; nevertheless, those case study can be really useful and illustrative on some issues facing the decision making model (for ex. the key role of some actors in some kind of processes or the influence of the political factors in the decision making power of specific stakeholders[13]).

The way that we are going to use to explain the reform is the narrative of the process by which the decision that produces the change occurred. (Ragin, 1987) We will apply a narrative structure to establish the chain of events that need to be explained. The narrative is organized around key events within the episode and related to its occurrence. Some of the relevant events are selected to be analysed because of their relevance. The events initiation and termination as well as their internal dynamic are explored in a similar way in order to allow further comparisons. (Gaetani, 2002)

Decision-making processes are composed of parallel and serial events. To clearly recognize and analyse the reform episodes we have to identify and designate such events and explain how they began, progressed and ended. In Watertime we are going to introduce the factors and actors in the events and episodes. Factors are related to the concrete events. Some events are specially determined by the action of the specific actors and we will have to identify them.

The basic element to understand the concrete case, experience or episode is the event. The set of events directly and intimately related to decision making reform constitute an episode. An event is maybe the key notion in the modelling of dynamic systems. In terms of change, an event has been taken to be a change or composite of changes (it may be absence of change, e.g. 'the lawn stays wet', or 'I remained still for five minutes'). Some writers define an event to be instantaneous while others allow it to have duration. As with objects, we should take care to distinguish event type from

[12] Barzelay develop the New Public Management benchmark case as a methodological resort – the construct of an ideal type- to investigate public management changes in UL, New Zealand and Australia. In Watertime the decision making model play a similar role.
[13] See Gallego, 2002.

event occurrence, for example horse race is the type and the 1996 Grand National is the occurrence. (Worboys, 2001)

3.3.2 Analytical narrative

The Watertime analytical narrative approach try to combine historical and comparative research with rational choice models taken into account the theories and approach described in the literature review point. Narrative must take into account the path dependence. In order to understand factors and actors of decision making origin and change, the analytical narrative approach requires a deep knowledge of the case. This means, first extracting from the narratives the key actors, their goals and the factors that explicitly influence them. The cases must include problems of randomness or contingency but not if they are too extreme the approach rest on cases where there is some but hardly complete in the path of the history, cases that the model helps in understanding what was probably to happen. The narrative and the analytics are much intertwined. The approach does not involve the deduction of hypotheses from a very general model and their testing with appropriate cases. The models used to elucidate the casual connections are iterative and inductive although the initial intuitions may have been deduced. The case research has begun with some basic information and some theoretical priors. In Watertime we have appeal to various theoretical issues, described above, even when these issues do no more than re-describe the situation in slightly different terms or illuminate only a small part of what we are investigating in the case studies. Their analysis depends on the context; each of these theoretical issues can either lead to efficient or inefficient solutions, to a problem solved or to a problem not solved. Once the case is sufficiently understood, the researchers apply the theoretical tools to capture the key elements that explain the decision making reform. The analytical is built in path dependency. This requires more than identifying the constraints that derive from past decision making. The sequence in which the events occur is causally important: events in distant past can initiate particular chains of causation and have effects in the present. Path dependence also implies that once certain decision making are in place and with certain distributions of power, authority and information control, it becomes more difficult to reverse or change course.

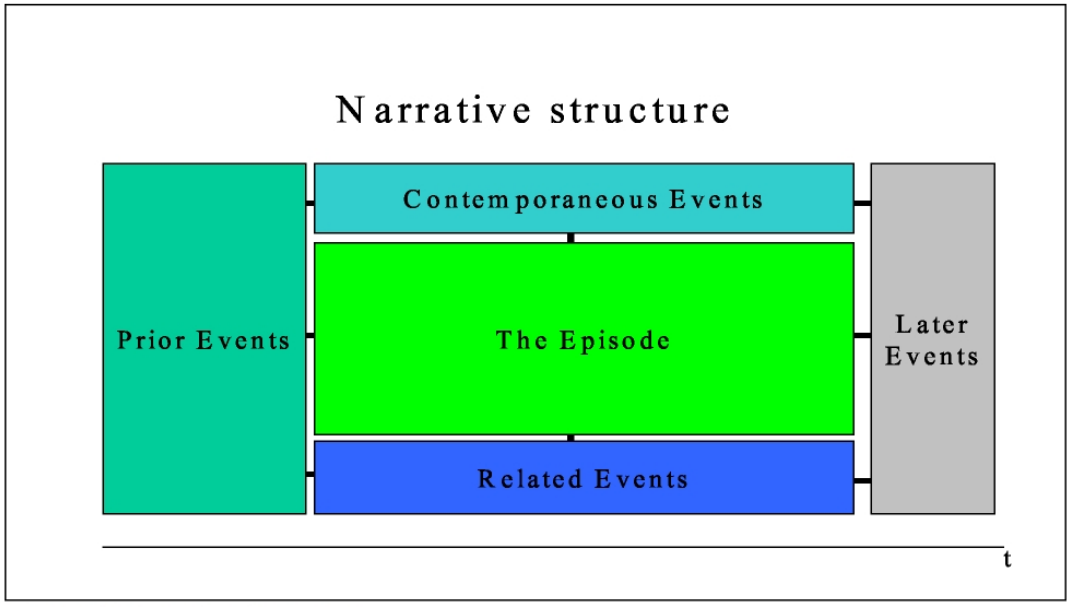
3.3.3 Narrative structure

As we say above, the basic element within an experience is an event. The set of events directly and intimate related to decision making reform constitute an episode. In each concrete case study we will chose the most relevant episode or episodes[14] in order to acquire a formal knowledge about decision making reform taking specially into account the participation and sustainability issues.

The events include prior events and contemporaneous events. Prior events occur before the episode while the contemporaneous events occur in the same time frame. We can observe as well related events coincident with the episode but more affected by

[14] The relevant episodes can vary depending on the case. See Gaetani 2002 and Raquel Gallego 2002

the episode than the other way around. In some cases we have to include later events when their anticipation conditions events within the episode.



Each of theses groups of events can be divided even into a number of sub events or activities. Our main interest is the identification and explanation in terms of the actors and factors the event outcomes; that is, we have to identify what is the outcome of the event and to provide an explanation for it using narrative methods and the theoretical tools that we have describe above. To explain events outcomes, we look to other events as sources of change or stability in decision making. Thus, we look beyond the episode into the prior events. They help us to understand the situation beginning of the period including the factors that influence the decision making in the episode.

The events are showed in the episode event's table. These tables contains for each episode the set of events and each line consists of a single event, with fields for the dimensions described before, that is the date, the actor, the factor(s), and the participation issue. The impact on decisions and the link to each other is also in the table.

The following table is a previous example of an episode in the Grenoble case study

From the privatised concession to the public-private joint venture in Grenoble as an episode[15]

Event no	Date	Actor	PESTE Factor	Action	Impact on decisions	Source events	Consequent events
1	June 1995	Opposition parties	Unpopularity of water privatisation	Win municipal elections	Termination/renegotiation of privatised concession on the agenda		

[15] For details on the story of Grenoble, see http://www.psiru.org/reports/2001-08-W-Grenoble.doc

Event no	Date	Actor	PESTE Factor	Action	Impact on decisions	Source events	Consequent events
2	November 1995	Court of justice	Powers of investigating magistrates in France	Former mayor and Suez executive receive prison sentences for corruption	Flaw of decision making process leading to privatised concession is revealed		
					Increased political cost of maintaining the status quo		
3	November 1995	CRC (Chambre Régionale des Comptes)	Competence of French public audit bodies	Report on privatised concession exposes excessive costs	Economic flaws of the privatised concession are revealed		
					Increased political cost of maintaining the status quo (also in light of electoral pledges)		
4	June 1995-May 1996	New majority in city council	Commercial law governing relationships between local authorities and private operator	Evaluation of termination in light of compensation to be paid to LdE	Perceived economic cost of opting for unilateral termination of corrupt concession		
			"*Tribunal du commerce*" chaired by entrepreneur, not professional judge – unfavourable context for city				
5	June 1995-May 1996	ADES (green party within new majority)	Limited political representation of radical views	Opposition to renegotiation option	ADES makes the case for unilateral termination in light of corruption		
					ADES fails to change the decision of the city council		
6	May 1996	New majority in city council	Political costs of maintaining status quo compared against economic costs of unilateral termination	City council decides to renegotiate privatised concession into public private joint-venture with LdE (SEG)	City council assumes majority of debts of the privatised concession		
					SEG still controlled by LdE, economics of PPP do not change (SEG as an empty shell)		
					Question of legal validity of previous acts (e.g. setting of tariffs, decisions of city council) left unsolved		
					City council fails to put concession out for tender (validity of decision for PPP to be questioned later)		

The episode is defined by the researcher after a deep knowledge of the case study. As we explain above, each case study requires dealing with an appropriate amount of information about the concrete case that must be gathered before the episodes identification. It is not possible to establish a limited and fixed list of episodes. Each case study can have many episodes, which can overlap with each other. Using the case

studies reports we will able to establish an episodes classification or typology that will permit us to cluster and analyze them.

The episodes are narrated by mean of the events. The events are the unit of analysis which allows analyzing the PESTE factors, actors, their characteristics and role, as well as the participation and sustainability issues. The same kind of events can form part of different episodes. In the general scheme that we describe above we include four kinds of events that help us to understand the episodes context and the events contained. International, EU and National context reports are a useful tool to identify a set of general prior and contemporaneous events that affect the various episodes.

Inside the episode we will find events' sequences. In a concrete time an event passes, goes by. This event is the consequence of other event or events and, at the same time, is the source of other event or events. 'Sources' and 'consequents' are the links that tie the events together. 'Sources' includes an event that the current event is a reaction to; 'Consequents' include a reaction to the current event.

The impacts are concern to the effects of the events on decision-making and policies, more explicitly to the episode that we are analyzing; eventually in the reform of the organizations forms or in the defeat of reform process. Thus, impact concept is not concerned to the direct event outcomes such as the increase or decrease of the number of people without water.

For analysis purpose, preset categories of actor are created in the standard format for case studies (e.g. consumers, environmentalists, trade unions, civil society, parliament, political parties, government, municipality, regulator, courts, auditors) as well as categories of factors. As a result of the case study reports we will redefine the set of categories of actors and factors to be used in the final decision model.

3.3.4 Time, process and decisions

The aim of the case studies is not to paint a static picture of the governance of the urban water cycle at any given point in time. Instead, its aim is to construct an analytical narrative of how actors (individual and institutional) and factors (analysed via the PESTE framework) have over time contributed to specific decisions taken into account sustainability and participatory issues. The most important difference between the picture and the narrative is the incorporation of the element of time, which enables the study to identify the processes by which actors, factors, and processes influence each other and change over time.

Figure: Static representation of decisions

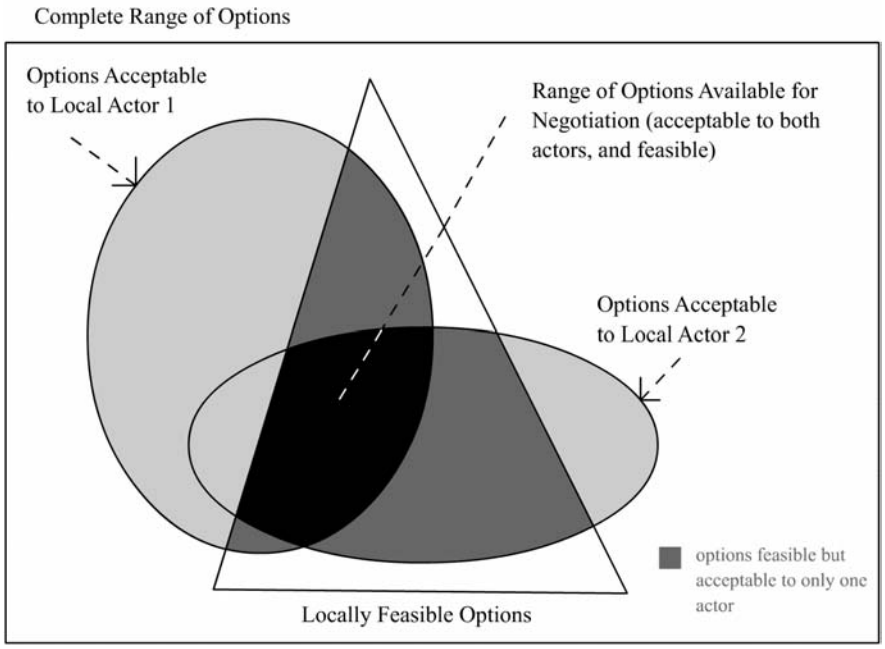
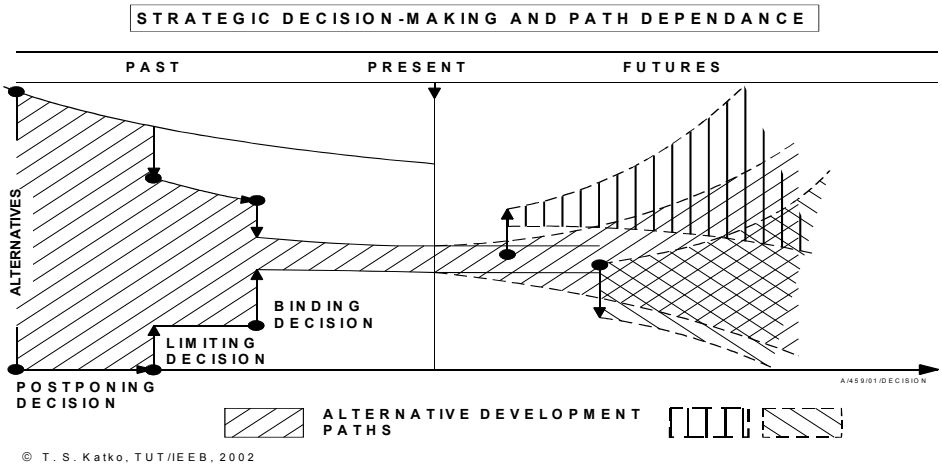


Figure: Decision-making processes over time



At a basic level, the views of interest group theory, path dependency models, principal agent theory, transactions cost and the garbage can theory of organizational science all express the same beliefs about the fundamental operations of institutionally-based decision-making processes. In particular, the rationality expressed in the day-to-day processes of institutions like local authorities is *not* only the calculated rationality of rational choice, with actors performing exhaustive searches of all possible options before reaching decisions. Systematic, fairly exhaustive searches may sometimes be initiated by actors, but such searches happen in the normal context where actors and decisions are continually buffeted by the slings and arrows of outrageous fortune, of blatant self-interest, and of irrational behaviour.

3.3.5 Elements of construction

The construction of our mental film or narrative[16] involves the construction of a set of basic elements:

a. actors
b. factors
c. events

Formal elements of analysis

Element	Description
Actors	the actors, A1…n, involved at any time during the period
Factors	PESTE framework factors F1…n which turn out to be relevant to urban water cycle decisions
Events	Each event E1…n, where an event is the smallest unit of information useful in the context of each episode in the case study, e.g. the publication of a report, a council meeting, the restructuring of an actor, or a change in a factor.

The broad structure of what is outlined here (actors, factors, etc) should be a universal framework for the case studies, and one which leaves much scope for adapting the framework to local needs to record relevant dimensions of the decision process within this overall framework. For example, the subheadings suggested below for each group (e.g. for actors, power and goals are two suggested subheadings) can be adapted for local use.

1. scripting the series of individual events that took place
2. storyboarding the series of events into a decision map, in which all actors are listed vertically, with a timeline of events horizontally along the x-axis.

Events/decisions mapping

	Oct 1981	May 1982	May 1983	
Local council		E2		
Trade unions				
National government	E1			
Privatized water co			E3	

[16] Based on methods employed by a number of comparable studies, including Hunt, Raymond G, and Magenau, John M., "A Task Analysis Strategy for Research on Decision Making in Organizations", in *Decision Making in the Public Sector* (ed Lloyd G. Nigro), NY: Marcel Dekker Inc, 1984

3.3.6 Formal characteristics of elements

3.3.6.1 Actors

- The actors, A1…n, involved at any time during the period

Appropriate characterization of each actor, particularly in relation to power, motivation, and goals.

Examples: Actors and attributes

Actor	Name	Description	Power	Goals
A1	Grenoble Council	Local council	Strong in relation to local structures; strong politically as large majority for governing party and opposition enmeshed in scandal	Reduction of budget deficit; increased private sector involvement; personal enrichment
A2	Trade unions	Several local trade unions working together	Strong in terms of membership coverage of relevant sector; weak political support from membership	Job protection; resisting increased work pressure from introduction of profit motive

This is a *formalized* framework, which has the advantage that it does not exclude a priori any possible agent or event. This can best be seen in the element of actors. This category includes not only individuals but also groups, e.g. municipalities or consumer associations; but it also includes not only local institutions but also regional ones, such as the EU itself (the actor which introduced the WFD) or the World Bank (for example through conditions attached to its loans). The diagram shows how various types of actors can be found at different levels – yet still omits global level actors.

3.3.6.2 Factors

- Those PESTE framework factors which turn out to be relevant to local decisions

This framework explicitly includes all kinds of subjective motivation and behaviour, as well as objective factors (e.g. rising water demand)

Examples: Factors

Factor	Description	Associated with actor
F1	Demographic changes leading to rising water demand	
F2	Ideology	A1
F3	Need/desire to reduce public borrowing	A1

3.3.6.3 Events

Each event E1…En, can be seen as the smallest unit of analysis useful in the context of each case study, e.g. a meeting, an election, or the introduction of a new law, the restructuring of an actor, or a change in a factor. A table can be constructed listing all the events associated with a decision process, from beginning to end.

Examples: Events and attributes

Event	Part of which decision process?	What (description)	Who (actors)	Why (factors)	When
E1	D1	Change in national legal regime	National government	International treaty	Oct 1981
E2	D1	Exclusion by municipality (A1) of option (C1) of continued public ownership	Council (A1)	Legal changes, budgetary pressures, ideology (F2)	May 1982
E3	D1	Raising of water prices	Privatized water co		May 1983

An event in Watertime is an item of information linked to a point in time. Items of information that relate to changes over a period of time may be treated either as events (for example, a change in public perceptions over a period of several months) or as factors (for example, a growing dissatisfaction with the performance of a utility). Again, the distinction is up to the researcher, and as a general rule would depend on whether the item of information is to be treated as exogenous – in which case it should be listed as a factor.

Box 1: Examples of possible events

Decisions
Beginning of decision process
Decision taken

Options
Option raised
Option killed
Option supported
Option opposed
Reformulation of an option

Actors
Actor included
Actor excluded
Change in relationship between actors
Change in structure or aims of an actor

Factors
Change in a factor

Outcomes
Change in an outcome, e.g. water quality

3.3.7 Grouping the elements

3.3.7.1 Primary grouping: constructing an episode

The framework of basic elements (actors, factors, events) must now be structured into an *analytical* framework by clarifying in more detail the nature of the processes involved, and in particular the relationships between different events. These relationships can usefully be collated into episodes (i.e. groups of events), by attempting to identify sub-parts of the process that have their own dynamics, based on groups of actors, combinations of factors, or links between events, or whatever seems appropriate. The theoretical background papers will be relevant here, with the different lenses provided by different theories and approach, potentially suggesting different groupings of events, and the individual case study author being able to choose the most suitable. For example, path dependency might

suggest a link between a previous technical decision and a current factor limiting possible options.

To clarify, episode in the Watertime Analytical Framework is simply a grouping of events. They need not be exclusive, either – to highlight particular features of the underlying process, the same set of events may sometimes be usefully grouped one way in a number of related episodes, and also grouped another way, in differently-structured episodes, with both presented to the reader as alternative interpretations or emphases on different issues.

In identifying these relationships between events, it will likely be useful to bear in mind different categories of events, in order to identify particular episodes. In particular, there will be events that relate to particular decisions, or to particular options available for a decision, or to changes in outcomes (e.g. a change in water quality), or to changes in actors (e.g. the restructuring of a water company) or in factors (e.g. changes in the legal environment due to an EU directive).

Episodes

Episodes	Part of which decision process?	Covering events:	What (description)	Who (actors)	Why (factors)	When
Ep1	D1	E1,E2,E3	Dodgy privatisation	council	Personal gain, budgetary pressures, ideology (F2)	Oct 1981-May 1982

It will be useful to use these series of events and episodes to storyboard the relationships between the items (actors, factors, etc), by illustrating them in various diagrammatical forms (different forms to convey different aspects of the decision process). One approach, already noted above, is a decision map, in which all actors are listed vertically, with a timeline of events along the x-axis

3.3.7.2 Supplementary grouping: decision processes

The basic elements (actors, factors, events), the primary grouping (episodes), and the presentation of these in tables and diagrams form the bulk of this aspect of the analytical framework. However, in collating analytical episodes, it may be useful to draw up comprehensive lists of the decisions, and options and outcomes that relate to these decisions, in the period under consideration.

For all decisions $d_{1...n}$ in the period:

- the nature of the decision
- the actors involved (and excluded)
- the factors involved (and excluded)
    - objectively/consensus/according to the case study author

- according to individual actors

- any outcomes linked to the decision

Decision processes

Decision process	Description	Options considered	Actors [excluded]	Factors [excluded]	Outcomes
D1	Privatization of municipal waterworks	C1,C2	Local council (A1) [Trade unions (A2)]	According to - Local council: public borrowing (F3), [ideology (F2)] Trade unions: Ideology (F2)	personal enrichment (O3); increased water prices (O2)

Options:

For all options $Op_{1...n}$ for each decision in the period

- description of the option

- which decision process it relates to

- who supported or opposed it

- whether it was adopted, rejected, or partly adopted (e.g. elements extracted and mixed with another option, ultimately adopted)

- why it succeeded or failed

- objectively/consensus/according to the case study author

- according to individual actors

- role of status quo (a special option, usually the default position)

Options: examples

Option	Description	Part of which decision process?	Fate	Actors supporting - opposing	Reasons for success/failure
Op1	Continued public ownership	D1	Rejected	Trade unions (A2) Local council (A1)	Trade unions: council ignored stakeholders, filled their pockets
Op2	Privatisation	D1	Adopted	Local council (A1) Trade unions (A2)	Council:

Outcomes:

For all outcomes $O_{1...n}$ for each decision in the period

- changes in sustainability and other outcomes

- relationship to particular decision(s)
  - objectively/consensus/according to the case study author
  - according to individual actors

Outcomes: examples

Outcome	Result of which decision process?	Description	Relationship to decision, according to different actors
O1	D1	Loss of transparency	Local council (A1): small Trade unions (A2): large
O2	D1	Increased water prices	Local council (A1): small Trade unions (A2): large
O3	D1	Personal gain	Local council (A1): none Trade unions (A2): large

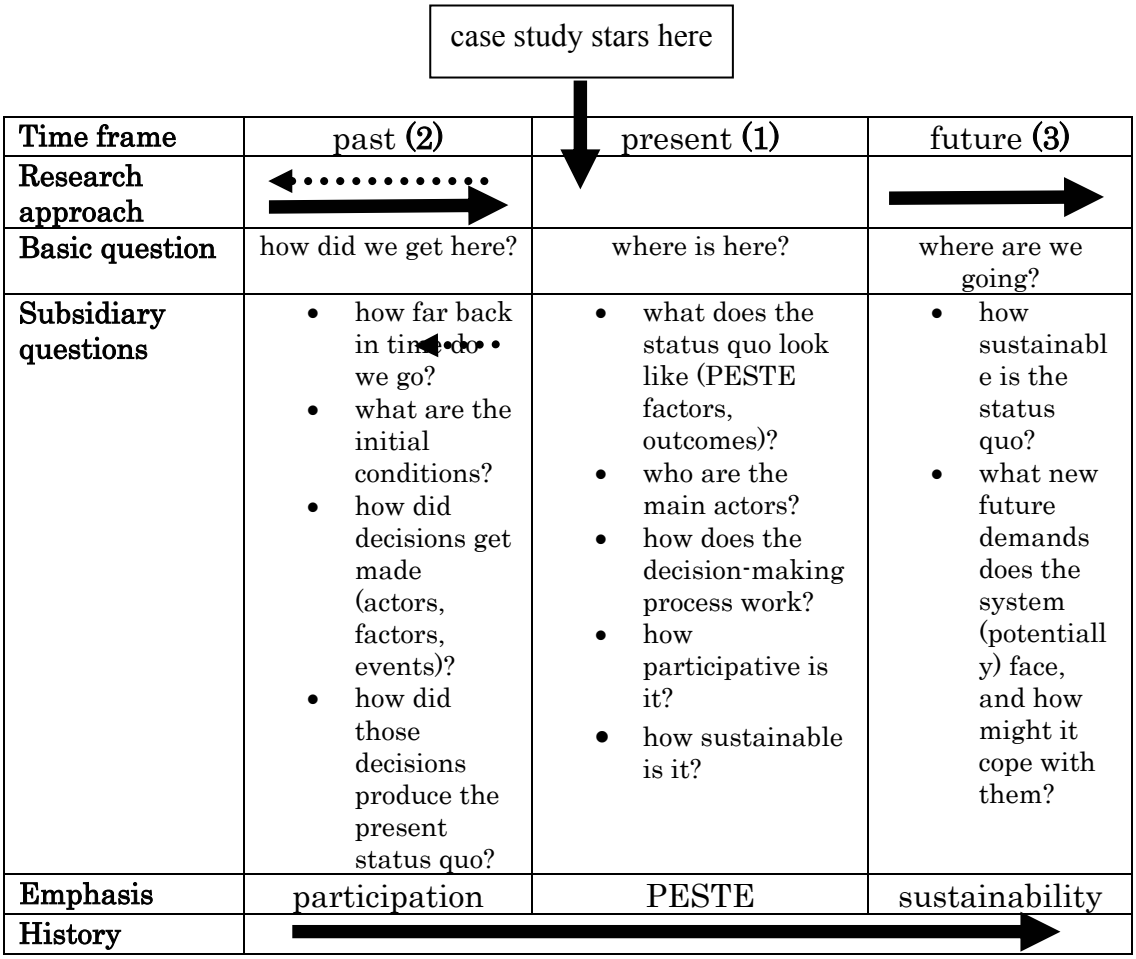
4 Using the framework: standard format for case study reports

4.1 Introduction: purpose and use of the standard format for case study reports

A case study standard format is intended to guide the researcher in carrying out the data collection. It is described by Yin as "essential" for a multiple-case study – and this is even more true, when, as in Watertime, a number of different research partners are involved. However, whilst the standard format must ensure comparability and compatibility across case studies, it is aimed primarily at data collection and analysis at the level of the individual case study. Although it will be laid out in detail as part of the WP1 (D5), the following points introduce different elements which will be included in the final deliverable

The job of the standard format is, at the level of the individual case study, to provide a standardized agenda for the investigator's line of inquiry, together with some standardized tools for following the inquiry and structuring the data gathered. However, for reasons of flexibility, only a rough outline of some of these tools is laid out here, with the details to be fleshed out later by partners amongst themselves, using the communications tools already in place (in particular the Watertime website). This will be particularly important whilst case studies are in progress, when partners will find the need to adapt, refine, extend and add to the tools described here, and good communication will be needed at this stage to prevent unnecessary difficulties at the later synthesis stage (WP4).

4.2 Overview



(1) Understanding the present status quo

Understanding the status quo, in terms of

- PESTE factors and outcomes
- main actors
- operation of the decision-making processes
- sustainability and participation

An indicative list of descriptive indicators is provided in following point 4.4 The list is not meant to imply a need to acquire every item of information in it with a high degree of precision: it is designed to prompt enquiry, and researchers are expected to initially focus on those indicators that emerge as important, leaving gaps to be filled at a later stage if necessary and possible.

In addition, a set of criteria for evaluating sustainability and participation on a comparable basis across case studies is provided in Annex C.

(2) Understanding the past

The initial understanding of the status quo should have provided enough information to decide roughly how far to go back into the past in order to find the sources of the important influences on the present. A conventional textual narrative is drafted, alongside the stylized narrative structure of events, actors and factors linked into episodes. The primary focus is on decision-making – how decisions were made, by whom, and why; and what were the outcomes of those decisions. This includes an emphasis on participation – how participative were decision-making processes, and how did this affect outcome.

(3) Understanding the future

Having achieved a fuller understanding of the present through investigation of the important causal influences in the past, the case study should address more fully the issues of how sustainable the status quo is, in the light of possible future challenges.

4.3 Research questions

Individual case studies will identify

- the forms of organisation of water and sewerage systems used in the cities (e.g. public and private roles in provision, production, regulation, finance, levels of government)
- the reforms made in the recent period
- the decision-making bodies and stakeholders participating in the process
- the relationship of the decision-making process to the regional, national and European levels
- the transparency, public openness and participatoriness of the process
- the range of factors taken into account

And, in the other hand, selected case studies will assess the sustainability of decisions made against a range of political, economic, social, technical and environmental consideration of the effects on the quality of urban life.

In addition, the case study findings will be related to the historical context of water development in the cities, and in Europe generally, through a parallel 'City in Time' analysis.

The issues to be covered have been identified by using the partners' expertise to identify issues that arise in the case study and other cities on the basis of existing knowledge and have also been elicited from the different theories reviewed.

4.4 Descriptive indicators and checklist of Questions and Issues

We can find a very varied combination of users and bodies responsible for provision and production, taking into account the different water uses and the cycle phases (see table on Annex F). We will need to identify those aspects in each case study in order to make them comparable, and instead of focusing on the differences, we might emphasize the present state in every city. This means finding answers to a few standard questions developed further in the standard format for case study reports:

1. What is the water sector performance in the given city? What is the water system comprised of? (Typically, urban water infrastructures extend far beyond the city limits, involve many uses other than households, and offer other services such as keeping high water pressure for fire fighting or rain water collection and disposal).
2. Who is formally and legally responsible for what regarding urban water issues? That is, who are the decision-makers?
3. What are the natural conditions, e.g. the origin and availability of water, competing non-urban water uses or water polluters?
4. What exactly are the urban uses (household, industry, fire fighting needs, public schools, parks, pools, ecological purposes)?

With these points in mind, and by keeping the list of questions and issues open and flexible, we should be able to come up with some analysable data on the status quo which defines the background for urban decision-making on water. In addition, the table in Annex F not only shows the possibilities to combine water uses, provision and production bodies responsible but also is a good approach to understanding the multiple options that we will find in the selected case studies.

4.5 Data collection and management methods

A primary data management technique will be the use of a database to index and organize the case study data collected. The main aim of the database is to manage primary resources and materials, although in the course of WP2, WP3 and WP4 this may develop into a more analytical approach. For indexing purposes, each primary or secondary source (documents, interview notes, press cuttings, etc) is to be given a unique reference code and entered into the database, together with a short summary if possible. The aim is to be able to maintain an overview, both within case studies and at the later synthesis stage, of the materials collected. At the later stages of the project it should be possible to discuss examples drawn from analysis carried out in particular case studies, and to be clear about what the evidential basis for the Watertime understanding of those examples is.

5 The Analytical Framework and Watertime's outputs

5.1 Best practice guidelines

The 'best practices' envisaged are most likely to be procedural in nature: for example, conducting public consultation exercises, holding referenda, confidentiality/publication of material; on a technical level, conducting an EIA before making decisions, or using benchmark indicators. They may include substantive points as well, e.g. barring 'entry fees' for private concessions. Many of the most obvious best practices may already be legally required or strongly recommended, either in national law or the WFD. A checklist of 'established and well-known' good practices can be drawn up from the outset, which can then be used in the case studies to check that they have been followed or not, and with what consequences.

The best practices are expected to cover 'a range of decision-making scenarios', so that for example they should include best practice guidelines for such cases as

- when a municipality and a 100% municipally-owned water company disagree over price rises;
- when a city is approached by a private company with a proposal;
- when an election is held in which water privatisation or municipalisation is a contentious issue.

In addition to guidelines on how different parties may implement best practice in relation to a given decision, the guidelines will also cover the longer-term issue of best practice decision-making systems. The best practice will also include concrete examples from different geographical contexts, specifically north-south differences, and presumably other variations such as 'old EU' or 'transition'.

5.2 Decision-making model

The elaboration of a decision-making model (WP5) does not mean trying to construct a detailed, universally applicable model of how decision-making in urban water systems works anywhere and everywhere – if so it would be certain to fail. Instead, the final Watertime decision-making package to be implemented through the stakeholders involved (e.g. by local authorities) should be seen as containing four elements:

1. *Broad description of reality* of decision-making in urban water systems
   - synthesised from the case studies and City in Time
   - including examples of best practice
2. *Localised description of reality*, of decisions to be made, options available, consequences, e.g. from local/national experts
3. *The computerised decision support system (DSS)*, which is less a model than it is a decision support system adapted specifically to decisions about water, which enables the involvement of the public and different stakeholder groups.

4. *A guide for the use of the Package*, including
   - guidelines for use of the DSS,
   - guidelines/procedures for the transparent involvement of experts in part (2), and the
     incorporation of these local issues with (1)
   - guidelines for the dissemination of this information to the public in various suitable forms
   - guidelines for the running of the DSS
   - suggestions for integration in the overall decision-making processes of the relevant authorities. (E.g.: it is recommended that the use of the Package should be overseen by an independent, neutral group, with representatives of the various stakeholders.)

In this package the Watertime project supplies (1), (3) and (4), together with guidelines for the construction of (2). It is important that the integration of part (2), the local knowledge, into the Package (which must be done by the end-users of the Package) is described in the guidelines and recommendations for the use of the Package, to try to limit the potential for co-opting the Package to provide a veneer of acceptability to bad decisions already taken.

The WP5 WaterTime model will thus be a (preferably computerised) decision support system, and a set of guidelines for using it. It will not be a mechanistic model which selects the right answer for local decision-makers, This should be supplemented by other forms of structured debate and decision-making, not only to make the model flexible (a computer model will not always be appropriate in practice) but because the way in which decision-making is approached can affect the outcome. The model should enable and encourage the use of multiple complementary techniques, as different communication methods will encourage different kinds of interaction and/or encourage different respondents to participate. A multiplicity of approaches reduces the likelihood of users being trapped by any particular tools or processes they use.

It will likely be desirable in terms of flexibility that the model be easily deployable over the internet; run on readily available software and hardware; and operable at least to some reasonable degree without expert assistance. A model meeting these conditions will enable a large number of groups and individuals to access expert information, share their insights, debate the issues, and reach a collective conclusion. The problem, however, is in the details, and there is a large academic and practical literature on these issues which needs exploring at the appropriate stage of Watertime. In particular, there are major questions about how information enters the system (from experts and from concerned groups and individuals); how the information is processed (as far as possible) into a coherent whole; how issues are raised and debated; how long to debate specific issues in order to try to reach consensus; how to vote on specific issues where necessary. Whilst these and related issues are largely technical, there are also major issues that are more political, for example, which actors are expected to use the model, which are to control the overall process, and how binding the outcome is on the ultimate decision-makers.

This conception of the computer "model" (actually, DSS) is much more achievable, much more flexible, and therefore more universally applicable than an attempt to model, quantitatively, how things can/should/do happen. That aspect (the "description of reality") is much better conveyed qualitatively, in part (1). The job of the "model" (DSS) should be:

- to pull to together the inputs of the public/stakeholders
- to ensure dissemination and quality control of information to enable them to provide effective inputs. There should be a two-way critical process (not least on the range of possible options for the decision and on the range and relative importance of different decision-making criteria) and not merely a feeding of information to a passive public.
- ultimately to produce a recommended decision based on their inputs.

However, the question at this stage is not to predict what these outputs will contain, but to identify what kind of data will be needed from the case studies (WP2) and city in time (WP3) in order to produce these outputs. The role of the analytical framework (WP1) is to ensure that this kind of data is made available.

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[i] Source: The New Penguin English Dictionary, Penguin Books, London, 2001.
[ii] Source: http://glossary.eea.eu.int/EEAGlossary/S/stakeholder.