

## **Urban Water Dilemmas under the Multi-Dimensional Prism of Sustainability**

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*Abstract:* - The notion of sustainability in the urban water sector refers to a multi-dimensional spectrum of balancing social, environmental and economic interests. The supply-oriented traditional infrastructure notions in the domestic water supply developed around the perception of water as a “public good” and the market-based logic that succeeded them failed equally to respond holistically to the growing challenges. Aim of this paper is to contribute to the ongoing discussion on the redefinition of the basic questions that formulate the context of strategies and policies in the water sector. Furthermore, it suggests the necessity to focus on the identification of parameters neglected by current research. A key question is formulated in the paper: how water saving as a phenomenon and as a strategy is constructed in metropolitan areas and what do these interpretations reveal about competing notions of sustainable water management. This is approached through the hypothesis that the water saving dilemmas and “dualities”, shape but are also constructed by, the contesting interests and perceptions of actors which are based on responses on questions insufficient to address alone the multi-level notion of sustainability. This argument is supported by evidence of the instructive Berlin’s case. Athens’ case, is also employed in this paper, providing further empirical evidence from a second European metropolitan area.

*Key-Words:* water saving, domestic water, urban infrastructure, water management, water supply, water governance, water utilities

## 1 Introduction

Water saving constitutes an important aspect of the sustainable management of the resource, especially if seen in the light of growing natural and anthropogenic pressures and the impacts of the global environmental crisis. It is argued that the conventional notions on water savings, based on a build-and-supply logic, but also the more recent reliance on pricing as a key market-based mechanism to water saving issues both present certain difficulties and limitations. Critical literature on the impacts of those notions discusses their ability to address successfully the full prism of sustainability (social, economic and environmental).

The case of Athens, capital of Greece, a country with water scarcity, severe epochal and periodical droughts and peak demand during dry summers illustrates some successes but also important failures of these notions. Indeed the change from build-and-supply logic to a market-based one, led to an economically sustainable water utility but also to social and environmental criticism, while consumption significantly increased. Germany on the other hand, and specifically Berlin, have been particularly successful in terms of water saving. This raises questions on how this consumption decrease was achieved and what specific tools and mechanisms had been employed.

Since reunification, a series of complex causes resulted to a considerable decline in water consumption in Berlin, the new German capital. However this is creating unexpected technical, financial, social and environmental problems like the overcapacity of network, rising groundwater table, financial losses for the utility etc. Currently Berlin's water utility appeals for an increase in consumption but this raises more questions from a long term water saving perspective, especially as concerns at predicted negative impacts of climate change on regional water availability are raised. The picture becomes even more complex as the stakeholders are usually focused on one spatial level or a sustainability dimension and their areas of interest rarely overlap. This brings forward more issues, linked to a set of natural but also artificial "dualities" and dilemmas. The water utilities of major cities must give surface or groundwater saving priorities to their policies while facing unbalanced and often unexpected phenomena, like rising groundwater table in residential areas and lowering in the outskirts. Moreover they must address spatial imbalances of the resource

availability and relevant social dilemmas that arise by the exploitation of such resources. Water saving conservation efforts and strategies can be channelled either at regional or pipe level while bi-polarities of the debate (either/or dilemmas) etc. In short the water companies today face multiplied challenge on their decision making process in a highly complex environment. Relatively simple decisions of the past, like the expansion of the supply network to include a new service area, must now comply to a series of requirement that derive either from EU, national or regional/local policies, guidelines and mandates. In parallel it must meet the societal demands while satisfying investors and stock markets.

Such dilemmas pose the challenge to analyse the competing discourses on water saving, taking Berlin and Athens as illustrative cases, and always viewing the urban water supply through the multi-dimensional prism of sustainability.

## 2 The Discourses

There are mounting pressures on water resources at global level, as increasingly variable weather conditions resulting in extreme hydrological events (floods and droughts), create additional stress on water supplies essential both for the anthropogenic sector and for ecosystem health. These pressures arise from the natural variability in water availability and climatic changes but are also linked to national and international social, environmental and economic policies [1]. At European level, the problem of water shortage is particularly intense in Southern European regions, where some semi-arid zones are located, central and western European countries are increasingly subject to similar threats on their water resources making water saving strategies crucial to ensure water availability in the long term [2]. The impact of the climate change on the water resources contributes to the vulnerability of Europe to the extreme weather phenomena and is expected to magnify regional differences of Europe's natural resources and assets, where southern countries will become even drier in comparison to northern member states. Additionally, a combination of the raised concerns on the growing water stress and the risk of more people in the future living in river basins under high water stress ([2] and [3]) will intensify regional conflicts between users and competition between unequally distributed resources. Moreover, it is argued with high confidence [3] that many

economic sectors will be challenged and this might lead to a re-distribution of economic activities. Under these changes, even the basis of the social matrix, especially in the urban areas where the vast majority of European citizens live, can be threatened unless actions are taken to mitigate the effects of climate change on the water resources.

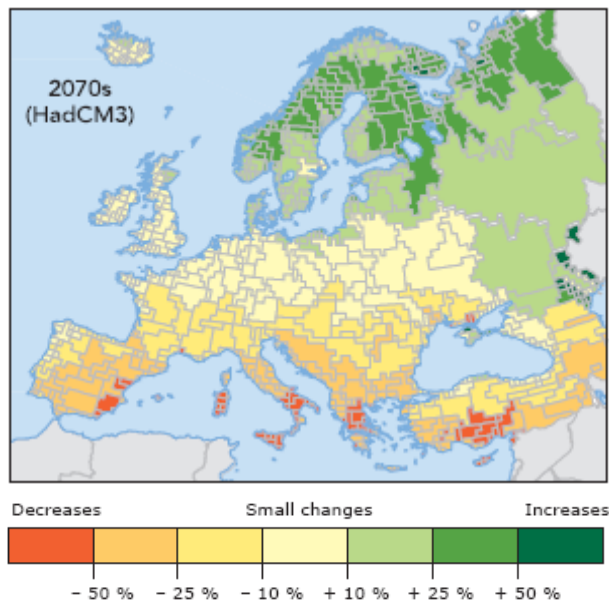


Figure 1: Change in annual river run-off in 2070 in comparison to 2000 (Source EEA, 2007)

This highly complex and uncertain environment has challenged the rather simplistic, often mono-dimensional but still adequate at the time, practices of the past.

Until few decades ago, conventional notions on domestic water supply were mainly utilized by the publicly owned and run water utilities. In such a framework, the ever-increased demand in the cities usually led to infrastructure responses under the “Build and Supply” logic [4]. New dams, inter-basin transfer, increased groundwater abstractions, technical and technological solutions and innovation to control consumption, formed the first “line of defence” against water shortages. Although such responses practically terminated thirst in Europe and managed to provide clean water to every city in the continent, only changed the character of the problem by transferring it either spatially (from local to regional) or temporally (from short-term to long-term risks). Furthermore, this approach resulted to a situation where the European water utilities inherited from the past, a huge, costly to maintain and operate urban water supply network ([5], [6], [7]).

Thus, the efficient use of water gradually became an important issue at European level and issues of domestic supply and saving have become key foci of European environmental governance debates. But as the European water sectors have been transformed over the last decades, to varying degrees through processes of privatisation, liberalization and internationalisation, a series of issues concerning water saving, are increasingly approached through market mechanisms and arrangements [8]. Critical literature argues the failure of both the state and the market to address complex issues of “public goods” and *especially* of water (e.g [9], [10], [11], [12] and [13]). However a pan-European shift is observed, where the roles and responsibilities of all involved groups, actors and stakeholders are reallocated under the logic of a gradual withdrawal of the public sector in favour of private arrangements and the commodification of the resource. Such arrangements are often hidden under the cloak of “sustainability” objectives and “participatory” procedures [14], [15]. In this framework, economic instruments emerge as the key tools to reach water saving sustainable objectives, whether sustainability refers to economic, social or environmental targets. This recent trend in the water sector has been argued by critical literature as a too short-sighted approach. Under certain viewpoints can be seen as merely an equally myopic replacement of the unsuccessful (or better “unsustainable”) infrastructure oriented responses of the past and insufficient to deal alone with the multi-dimensional prism of sustainability ([5], [6], [14], [15] etc).

## 2.1 The contesting dilemmas of two European Metropolises

Under the above perspective Greece, is a particularly interesting case. Long term water saving is considered vital to support the agricultural-based economy, provide drinking water to large urban populations and tourism destinations and also to sustain sensitive Mediterranean ecosystems. This is a particularly difficult task, as Greece is characterized by regional water scarcity, severe epochal and periodical droughts and peak demand during dry summers because of tourism. The “infrastructure” logic of the past, although ensuring water supply for the cities, resulted in other, mainly financial problems. After the partial privatization of the major water utilities, starting with the Athenian

utility in 1999, market-based mechanisms became increasingly important in water saving efforts [17].

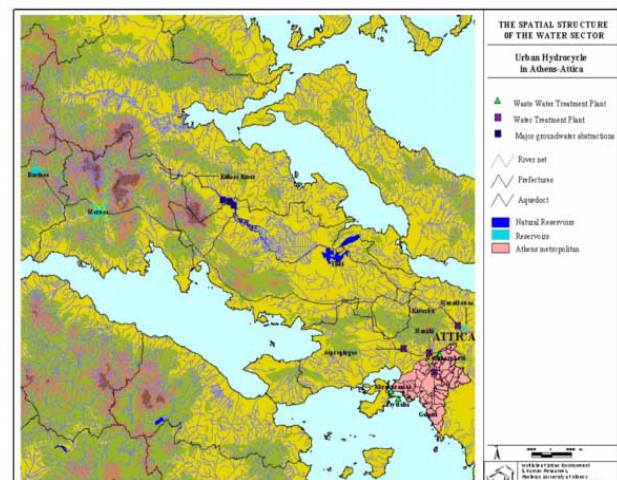
Year	Consumption (mil. m <sup>3</sup> )
1990	320,000
1991	340,000
1992	265,000
1993	250,000
1994	280,000
1995	310,000
1996	307,432
1997	319,427
1998	339,675
1999	357,003
2000	385,856
2001	400,558
2002	416,080
2003	399,220
2004	405,435

Table 1: Water consumption in Athens-Attica, 1990-2004

(Source: EYDAP)

The author had the instructive opportunity to follow the discourses on water resource management and notions of water saving in Metropolitan areas of Greece and particularly Athens for a long period and witness the transformation of the logics around urban supply ([18] and [19]). The empirical shown of this lengthy procedure indicates that the growing use of market-based tools as the key to a sustainable water management indeed failed to address successfully the full problem. The water utility of the past, dependant on governmental grants and subsidies to survive financially, developed a huge and costly to operate network (one of the largest in Europe) that is based on inter-basin water transfers from regions hundreds of kilometres away from the capital and on huge dams. On the other hand, since privatisation, the water utility significantly improved its economic status, but in some cases became also subject of criticism for its poor social and environmental performance. In parallel the industry attempted a control of the water volume used in the production under the requirements of European legislation but without intense support either by the State or the public (and later partially privatised) utility [20]. In this framework, water consumption has significantly increased in recent years reaching one of the highest per capita consumption figures in Europe (more than 200 lt./person/day), while particularly successful water saving campaigns have been

interrupted in an effort to reduce costs. And while the available water volume is significantly lower than in any other period during the last decade<sup>1</sup>, the water utility provides services to neighbouring regions and Islands while planning to expand even further, in an attempt to fully utilise the existing high capacity (and costly) infrastructure ([17] and [18]).



Map 1: Inter-basin transfers supply Athens with Water and makes the network of the city one of the largest in Europe (Source:UEHR)

In contrast to Athens, Berlin and Germany present a rather idyllic picture at a first glance. The county is characterized by relatively-high availability of water resources while a considerable decrease in consumption took place between 1990 and 2004 where the country's daily per capita consumption dropped from 147 to 127 lt., well below the European average [21]. Innovative water saving practices, like rain harvesting, combined with environmental awareness of the public and with the ecological and socio-political issues taken into account on many water saving related decisions and actions. This raises questions on how those water consumption drops were achieved and what specific tools and mechanisms had been employed.

<sup>1</sup> See <http://www.eydap.gr>

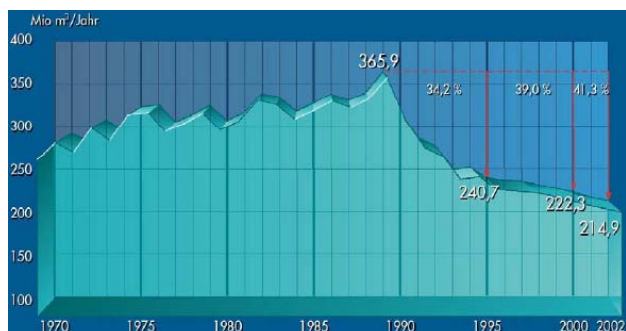


Figure 2: Water consumption in Berlin 1970-2002 (million m<sup>3</sup> per year)  
(Source: BWB)

Recently, the author critically approached on a comparative basis, the high priority issues around the politics of water in Berlin and the indicative problems the city faces. Berlin is an important case referring to the recently raised questions on water conservation as it is particularly effective in terms of water saving. There are sufficient groundwater resources of generally good quality within the metropolitan borders, and during recent years a massive reduction in water consumption has taken place (more than 40% between the reunification and today). This has resulted in one of the lowest per capita consumption in Germany [22]. According to Berlin's water utility (*Berliner Wasserbetriebe-BWB*) domestic consumption in 2005 was only 110 lt./person/day<sup>2</sup>.



Figure 3: Household and Industry Water consumption (in litres per day) in Berlin  
(Source: BWB)

The complex causes of decline in water consumption include a rapid de-industrialisation, demographic change and changing consumer's behaviour, new water-saving technologies, a pricing system that was giving incentives to reduce consumption and a high level of environmental awareness of the citizens amongst others.

<sup>2</sup> 160 lt./person/day including industrial consumption  
(<http://www.bwb.de/deutsch/trinkwasser/wasserverbrauch.html>)

However, this drop is creating unexpected problems and intensifies certain dilemmas for the utility and the relevant water policies, decisions and priorities.

## 2.2 The Dilemmas

Based on the above picture we can distinguish common dilemmas for the water utilities of the two cities, dilemmas apparent in other European cities as well and addressed in a rather uniform way as the paper will explain.

First of all any success in terms of water saving at pipe-level includes a high risk for the infrastructure, originally built to support a much higher demand. The supply network is likely to suffer from a dramatically reduced consumption. As a result of the over-capacity of the network in Berlin for example, the under-utilised city infrastructure lead to the regular flushing of the pipes, in order to avoid risks to public health [23]. Moreover, pricing strategies based on an entirely variable tariff, provide on one hand, high water saving incentives to customers but on the other, the reductions in water demand have to be compensated by price increases in order to maintain cost recovery. These price increases, however, further heighten incentives for consumers to reduce water demand, leading to an inefficient 'vicious circle'. Berlin, unlike Athens, did not have a pricing system- until July 2007-, consisting of a fixed basic charge and a component based on the actual consumption, and thus suffered from this vicious circle. Another emerging problem in Berlin partially linked to the low demand, is the spatial imbalance of the resource availability: rising groundwater table in residential areas that often results to flooded cellars and parks [21]. Facing these problems, the partially privatised since 1999, BWB, followed a rather controversial strategy. On one hand, it has appealed for an increase in consumption and introduces a partially fixed tariff, while on the other increases prices and promotes water metering, typical demand side management tools. But this approach raises more questions on the future results of such a scheme especially if the effects of the climate change are taken into account combined with a long-term, regional perspective.

Indeed, concerns are raised at the predicted negative impacts of climate change on regional water availability. The Greek regions watering Athens are already subject to such impacts and although Berlin's area looks sufficient in water resources at the moment, the wider Brandenburg

region faces the growing threat of water scarcity [24]. This problem is likely to be intensified in the future. Even now though, this could become an issue of growing importance if the interdependency of Berlin's groundwater reservoirs to surface waters from Brandenburg is to be taken into account in the long-term. Berlin faces a rising water table in settlement areas but also a constant need for groundwater enrichment on the outskirts, where abstraction to the point of over-exploitation takes place. According to the literature though [21] and interviews conducted by the author, this imbalance does not seem to be identified as a central issue, especially at political level. It should also be explicitly stressed that although the charging system until recently was giving incentive for water saving, it also involved important uncertainties for the water utility as its annual result had been entirely dependent on service demand. These uncertainties were met with constant price increases. As seen in the table below, since 2004, water price in Berlin has risen massively [24], and further tariff changes were introduced in July 2007. This would allow for a better reflection of the actual costs of the services. However such drastic price increases could potentially lead to a reduction of the general acceptance of the water services and intensify the protests of action groups against privatisation and the involvement of major multi-utility companies in the sector [21].

Year	Price increase (percentage)
2004	15,3%
2005	5,4%
2006	2,5%
2007	2,5%
2008	2,5%
2009	2,5%
Total	Ca. 30%

*Table 2: Domestic water price increase (Source: Alexis Passadakis, 2005, "The Berlin Water Works")*

From a political perspective conflicts between interest-groups are also likely to emerge as the three-dimensional prism of sustainability (society – economy – environment) requires a holistic approach that can overcome obstacles set by conventional logics around water saving in urban areas like Berlin. As water policy objectives are not only reached through different means but their

rational is also translated in a rather diversified way, changing aspects of water saving approaches are viewed under different prisms between sets of actors with little or no interaction between their interests. Their reactions are formed according to certain and often well established "areas of interests", either focused on one spatial level or a sustainability dimension that rarely overlap. As such BWB's and economists' responses, are moving away from the build-and-supply logic (still supported by technocrats and engineers) and are increasingly replaced by principles of corporate management, formed by the recent trends of commercialisation and the role of price to reach water saving objectives [4]. On the other hand, environmental groups are rather focused on ecological aspects of water scarcity and ecosystem health at the regional level. Further interviews with local representatives of the political parties, hinted that the political leadership is rather concentrated on financial issues and future business arrangements<sup>3</sup> concerning the utility rather than the broader aspect. The new role of the water users as "customers" as well becomes increasingly important and sensitive. Finally, citizens' action groups are sceptical of the social dimensions of the changes and bring forward risks linked to the loss of democratic control over the water utility and the future possible impact on the underprivileged parts of the society. As a result, certain dimensions of sustainability are approached in a rather fragmented way as reflected on the spatial and political level of the relevant water policies. The evolving role of various categories of stakeholders in such a changing system raises questions regarding the scope, context and effectiveness of water saving.

Thus, certain dilemmas on a set of natural but also constructed "dualities", apparent in Berlin and Athens are brought forward: surface water/ groundwater exploitation and their direct inter-dependence, lowering/raising groundwater tables, regional/ local water availability and effects of climate change on such interdependent system, low consumption vs. high consumption dilemma, bipolarity of the debate, expansion of services/ saving measures, full-/ under- utilisation of infrastructure etc. To generalise, we can distinguish some common key elements of the relevant discourses on water saving, dominated by questions on the character of the water to be saved, where it is to be saved, which tools to employ, what competing

<sup>3</sup> It is interesting that such arrangements avoid renegotiating the current regime under which a dependent to infrastructure's value revenue for the investors is ensured (see [21])

discourses on water saving methods exist and how far commercialization trends influence those discourses.

### 3 Discussion

The shift from a supply oriented, infrastructure-based logic to a more market-oriented one is apparent in other European urban areas and not exclusively in the above cases where this shift took place in parallel.

England and the full privatisation of the water utilities since 1989, constitutes the oldest case where some clear implications of the privatisation process and the shifting logics around water have taken a concrete form [25]. However, the particular case being unique in Europe falls out of the broader scope of the paper.

Similar dilemmas are observed in other Metropolitan regions of Europe as well. In Barcelona for example [26], equilibrium between water supply and demand has frequently been altered in the 1990s and a series of responses have been given to improve the general efficiency of the system. The construction of a regional water network able to absorb local deficits, the extension of metering, the relatively high prices in some of the municipalities and institutional campaigns to encourage the saving of water in periods of scarcity constitute the main responses typical in urban areas facing water scarcity. Other alternatives though, offering perhaps a greater potential, remain insufficiently explored. Innovative practices that require though a novel approach are prioritised rather low on the water policy agenda. Especially in the diffuse city, for instance, the construction of rainwater retention facilities could offer a supply source alternative for communal garden irrigation [26]. From a political perspective, such common European urban trend indicates a gradual shift from social-concern oriented policies towards those policies concentrated on economic targets. It can be also argued that this reflects different perspectives on addressing only partially the dimensions of sustainability.

However as in most policy areas the identification of the problem and the representation of it, lead to the formulation of the question to respond to this problem within the decision-making process. Consequently the "iceberg-phenomenon" according to R.Hoppe, plays a major role on the problem-solving process and the long-term success of a policy. In our case, both approaches concentrate

on a different "iceberg-tip", but always leaving the third, environmental, dimension of sustainability, submerged under the water. This very often results to a sporadic and fragmented response to environmental concerns, more as a by-product or in parallel with a predominantly social or economic measure or policy than an equally important aspect. As our cases highlight in the past, the predominant perception on the nature of "pressure" was rising from a growing demand and was leading to a race to meet this demand by providing more water. This in turn, led to the formulation of the fundamental question where water policies had been based for decades, on how to supply the European population with clean water, and consequently to the relevant infrastructure-based responses. In the long run though, this resulted to an extremely extended and expensive networks and infrastructure facilities, almost impossible to maintain and operate without an onerous financial burden to the state and the public water utilities. This increasingly problematic situation was further sharpened as long as the overall response to water supply was referring to the social obligation of the state to provide "clean, potable water for all".

This in turn gave birth to new pressure's perceptions, economic this time. Thus the question was re-formulated the last decades to address this new challenge: how *will* the economic viability of the utilities be achieved. The drinking water ceased to be an under-priced public good, market mechanisms were introduced and at a first glance it could be argued that at least the economic sustainability objectives have been reached. However there is strong evidence today that the result of this procedure will lead in the short-future to non-socially acceptable water price levels while the infrastructure network will remain operational despite the high costs (as the user undertakes the heavy financial burden and "co-finances" with the utility and the state the existing infrastructure and new investments). Still, both approaches keep for the environmental concerns a secondary role at best. The inefficiencies of both the responses, especially under the growing concerns on the changing hydrological characteristics of European countries (as IPCC's 2007 report pinpoints) seems that will gradually lead to the identification of new problems and the formulation of new questions concerning integrated adequate responses of policy makers on the supply of domestic water. Novel scientific findings transform the well-established picture of the natural resources and the environment, from a

constant or a relatively stable given situation where policies apply, to a highly complex and uncertain variable.

As the European water policies are still under an ongoing process of change, the above argument leads to a key question that urges for future research before further steps are taken at European but also at Members' States policies:

*“How is water saving, as a phenomenon and as a strategy, constructed in European metropolitan areas, and what do these interpretations reveal about competing notions of sustainable water management?”*

Such an approach would embed notions on how to overcome policy, spatial and disciplinary fragmentation of responses. The above question, urging for further research, brings forward the “dilemmas of governance” as approached by Jessop [27]; and it is worth mentioning that bi-polar or even confronting governance dilemmas are particularly intense in the domestic water sector. Contesting dilemmas like, cooperation of water stakeholders versus competition, openness of relevant procedures versus closure, governability versus flexibility, accountability versus efficiency etc can be easily distinguished in both Berlin's and Athens' cases. Such dilemmas, combined with the persistence to promote “business excellence” management systems [28] in a cut-throat competitive environment even to markets where the main product is a vital resource to sustain life, could potentially “lock” the political arrangements and decision-making processes and intensify conflicts in such a way that only meta-governance responses could offer a way out. In terms of governance, it is indicated that such dilemmas are not only a question of “good” or “effective” governance –terms particularly popular these days- but rather an issue that falls within the limits of “meta-governance” where the problem solving process is followed by a procedure of modifying the existing institutional arrangements with the aim to finally change how governance is governed (“governance of governance”).

Otherwise, there is a considerable risk that most European Metropolises, especially those extremely vulnerable to climate change, will have to face the crucial question; whether gains in water use and technical, administrative and financial efficiency can absorb increases in gross water demand derived from changes in income, demography, and the urban

form. Under this perspective social concerns should not be underestimated. As the paper argues, managing and controlling urban water supply appear to lie beyond the parameters of a strict water demand or supply management approach where the water utility attempts to give solutions either by purely build-and-supply responses or relying absolutely on market mechanisms. Unless new forms of governance are developed (see Table 3) and other policies (land use, social cohesion, employment, transportation, etc.) are implemented in order to reduce tensions regarding water and other resources, severe conflicts are likely to arise. In this sense, one point of the new Framework Water Directive (2000/60/EC), arguing for better sectoral integration in policy-making and more inclusive participatory procedures, is fundamental for many European Metropolises cases. If this integration and holistic approach is not taken seriously, then citizens may experience the irony of water utilities with increased economic efficiency accompanied not by lower but by higher gross water consumption or with a parallel decrease of demand and water availability.

<i>Conventional Forms (Regimes) of Governance</i>	<i>New Forms (Regimes of Governance, enabling Sustainable &amp; Innovative Policies)</i>
<i>Characteristics:</i>	<i>Characteristics/Values</i>
• guidance and control	• negotiation and argumentation (dialogue)
• hierarchical, central administrative intervention ('national')	• decentralisation, democratic partnership in policy making/implementation ('glocal')
• traditional mechanisms of majority decision-making	• intermediary institutions, active citizenship
• authoritative regulation, bureaucratic certification, formal adjudication, general regulatory framework	• socio-political legitimisation (acceptance), democratic control, improved institutional capacity, procedural approach, sharing responsibility, voluntarism, network
• clientism, electoral patronage	• rationalisation, reform, democratic decision making
• uncontrolled market mechanisms, oligopolistic structures	• strategic control of market mechanisms, public - private partnership
• lack of policy cohesion, fragmentation, lack of sustainability, innovation	• integrative approach, deliberate innovative strategies, socially sustainable outcomes

*Table 3: Conventional and new forms of governance that can apply in the water sector (adopted by [5])*

## 4 Conclusion

It is indicated that the discourses on domestic water saving are determined to a great extent by how water utilities and managers perceive and interpret certain notions of sustainability and which



problems they prioritise. Social targets pursued by engineers in the past are now being replaced by economic targets where economists withhold a key role. The political leadership follows another agenda supporting one approach or the other accordingly. But this polarisation of either/or and the systematic exclusion of environmental targets and broader spatial perspectives might lead to a further deterioration the water resources in a way that the economic, social and environmental impact will be severe and perhaps even irreversible.

The water sector and especially the provision of domestic water must ideally disengage from the still ongoing “war of the sciences” and provide instead a paradigm of interdisciplinary research and multi-level governance arrangements. Fragmented responses and solutions viewed from a single-perspective only contribute to a further disorientation of holistic practices that can tow the efforts for sustainable water resource management to a direction as set by sustainability principles.

Further research focused on addressing a complex question that embeds notions of the full spectrum of sustainability will allow a better understanding of the complexity of an area of such importance as the domestic water supply and the full spectrum of the interdependencies of the sector with the natural environment, the society and the economy at different spatial, administrative and political levels. This can soften the conflicts arising every time a certain dimension is prioritised against the others. Such a task requires an interdisciplinary approach (as the notion of sustainability is such by default) where the dominant role won't be undertaken by the political leadership, nor by social or natural scientists, economists or engineers. On the contrary it would entail a pluralism of problem-solving alternatives, based on the harmonious co-operation between different disciplines in a holistic way and with long-term sustainable objectives. Participatory forms of governance, might contribute towards this direction. However, this requires further commitment to (meta-) governance practices to create conditions in which the scope of participation is optimised at different levels (different policy domains and scales) and where the state and the market do not compete but instead contribute to the above logic.

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