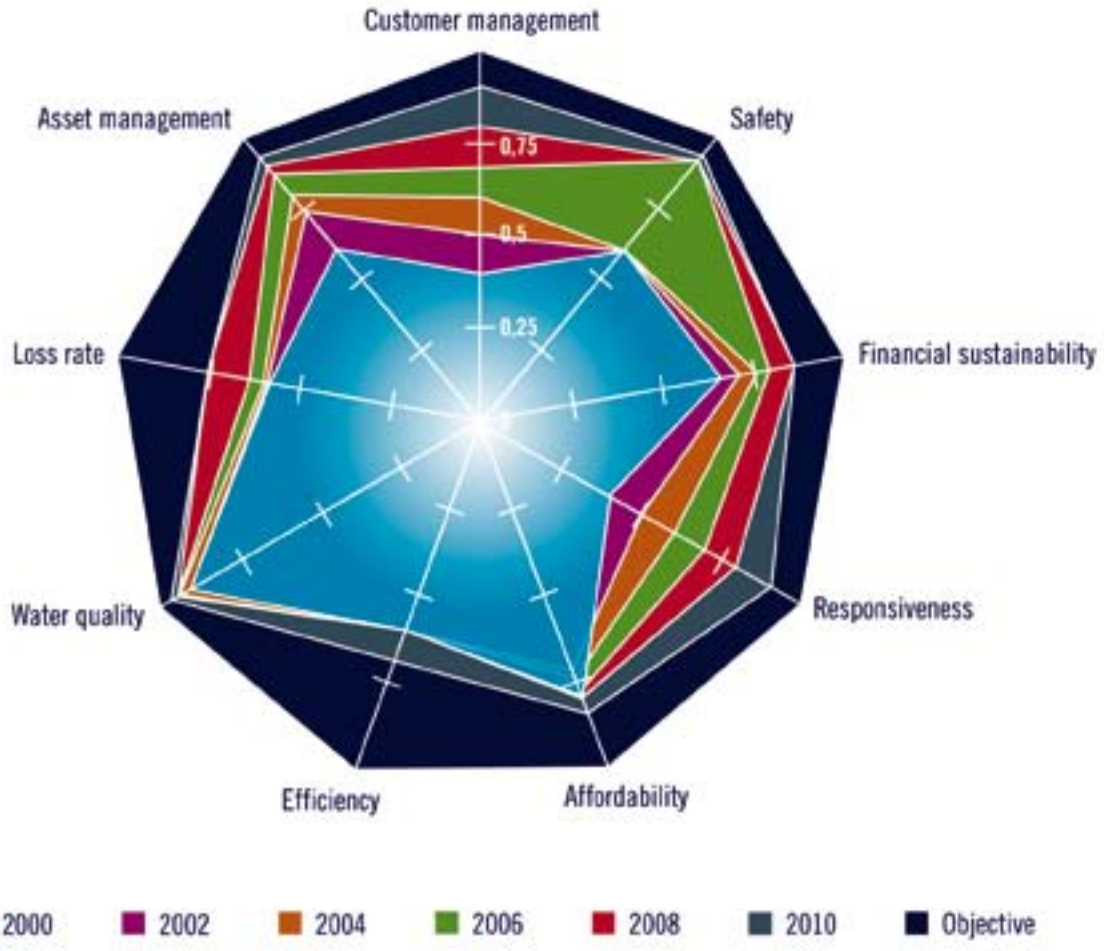
IMPROVING PERFORMANCE OF WATER AND SANITATION PUBLIC SERVICES



Edited for the 6th World Water Forum in Marseille (2012)

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OF WATER AND SANITATION PUBLIC SERVICES

Coordination: Pierre-Alain Roche, *President of the ASTEE*, Solène Le Fur, *policy officer at the ASTEE*,
& Guillem Canneva, *lecturer and researcher at AgroParisTech*
Traduction: David Heath, *translator* (dheath@noos.fr) & Lionel Fintoni, *translator/interpreter* (lionel.fintoni@orange.fr)

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Preface and introduction

IMPROVING SERVICES: AN EMERGENCY

PREFACE

André FLAJOLET
Member of Parliament
President of the CNE

The question of water is now universally established at the centre of collective thinking since this “common good of the nation”, present in a very unequal manner in time and space, has become the object/subject of a lot of scientific attention, of innumerable political discussions and of the core values of associations. Access to water is a basic element of real democracy and is increasingly topical in the political sphere.
The presence of water supposes the creation, maintenance and protection of a distribution system for drinking water and a reclaiming system for wastewater, both under the responsibility of policymakers.

This is the dominating structure that is almost taken for granted by those of us who live in France. It is a possible structure for some people, and an unattainable dream for many others, mostly women and children, fragile water bearers, who spend most of their time collecting water, and who sometimes even lose their lives to the chore.

For this reason, everything that contributes to furthering the knowledge of water in its many facets is strategic. France, through its laws passed in 1964, 1992 and 2006, has understood how crucial water is to our heritage. Europe, through its directives, has understood that the time of water extends well beyond the time of our daily lives. The world, through its humanitarian organizations, is trying to generate a new universal awareness concerning the right to clean water and sanitation for all.

This necessitates the on-going involvement of scientists to explore, seek, assess and imagine how water can and must be understood, shared, preserved and reclaimed both for people and for economic and agricultural activities.

To reduce the stakes associated with water together and to render the cost of public water and sanitation services acceptable, we must still fully explore the governance of the said services, raise awareness about the required sustainability of these services, accept the sharing of the resource so important to the different functions based on usage, and also promote a shared vision of the solidarity of a right to access, effective here and elsewhere because it is unthinkable to deprive humans of their right to live.

Because international situations have shown that water will increasingly be at the heart of possible conflicts, because urban development is making the access to water and sanitation more complex in cities, because the race for profit can lastingly deteriorate our resources by focusing on the present to the detriment of the future, because usage conflicts only magnify the need to compromise, it has become urgent to mobilize the wills of those who know and those who are aware.

Those who are aware must bring up the questions of water’s significance for Humans, Nature and the Future. These questions irrigate – or must irrigate – the core of our discussions held in previous World Water Fora and that are to be the basis for the solutions and commitments made at the forum in Marseille. There is still so much to say and do to establish human relations that are fairer and more rational.

But those who know must still come forward with their knowledge and their proposals for both governance and the improvement of knowledge and performance. This concerns the networks whose average age is becoming quite ancient, and also more widely all of the distribution and reclaiming systems. It also concerns all the applied knowledge where water is at stake. Today, the critical analysis of our initial knowledge allows us to say that there are limits to exploitation, situations that may become irreversible for resources or nature, and universal rules that are necessary concerning the exploration for raw materials.

The moment for the reconciliation of knowledge and awareness has become philosophically and scientifically urgent. The scientific world that is based on and sensitive to the question of significance, is acting to take up new challenges: feeding and quenching the thirst of seven billion people, all equal in terms of human rights; reconciling people and nature in a confident, value-creating environmental movement; exploring new ways to fight against the diseases affecting nature and people.

The World Water Forum in Marseille is a challenge to the heart and to intelligence, an event in the history of mankind revisited in the light of hope, in the duality shared by science and conscience. It is also an agora for politicians who have an essential role to play since they must decide on types of governance that respect functional geographic units, on the priorities for investments in prevention and reclaiming, on the transparency of prices and the reality of the Millennium Development Goals.

This book, published under the aegis of ASTEE and its President Pierre Alain Roche, lays out the multiple facets of a same route combining critical knowledge with real-life tests. These views are also statements expressed by people who have committed themselves to the service of others in a harmony of values and knowledge.

PERFORMANCE IS A MATTER FOR ALL

Gérard Payen[1]
&
Pierre-Alain Roche[2]

KEY WORDS: performance measurement, service, capacities, stakeholders

The theme of performance and governance of public water and sanitation services has been adopted as one of the target issues that will be a focus at the 6th World Water Forum. The aim is to identify existing solutions and to inspire commitment and action plans to improve services. This paper is published by ASTEE in support of this work.

Why are public services preferable to individual solutions for drinking water or sanitation? There are three key reasons. Firstly, to share efforts and reduce costs through economies of scale; secondly, to prevent some water users being disadvantaged by others in a context of limited resources; and thirdly, to meet government obligations with regard to human rights. In theory therefore, and with the exception of isolated habitats with abundant resources, it is better for people to use a collective drinking water supply and sanitation system than to try to organise their own system. However, billions of people around the world use unsafe water sources[3]. One third of the world's population has no public drinking water network, neither in their home nor at a standpipe. Of the remaining two-thirds, many complain that their water supply is of questionable quality, intermittent or too expensive. However, in many cases, programmes have been designed and investments have often been made, but a few years down the line, the service is not up to standard. There is a significant gap between theory and practice. On the whole, public water and sanitation services are significantly underperforming. In many cities in the developing world, services only reach part of the population, leaving the rest to source their water and dispose of their sewage and wastewater in more expensive and less satisfactory ways.

The number of urban dwellers left to fend for themselves is increasing continually because the growth of public services is not keeping up with the pace of urban development[4]. Furthermore, the water supplied by public services is not always safe to drink and in some places is only available irregularly or a few hours per week. Many facilities are no longer working.

The situation is even more dire when it comes to sanitation. Within the United Nations, the only world policy on sanitation is contained in the Millennium Development Goals. This target relates to "basic" sanitation, meaning access to decent toilets. Progress in this area is too slow. Although the number of people with no toilet is gradually falling, the number of people without any decent (hygienic and private) toilet continues to increase. Many cities are not able to develop a sewage and rainwater drainage system quickly enough to keep pace with urban growth. It is estimated that more than 80% of water used by humans is discharged into the environment untreated. There is however no shared global vision for the management of sewage or rainwater. Performance improvements and, as we shall see, the closely related question of governance are vital issues for these essential public services. This paper gives us an excellent opportunity to share some recent advances in this field. As an introduction to these contributions, it would seem useful to discuss the general principles that guided the working group discussions.

What does 'performance' mean for services?

How can the performance of public services be assessed? Who can judge it? And what criteria should be used?

The people with the highest expectations are clearly those who need drinking water – service users and people who do not yet have access – but also those who pay for the services – users and taxpayers. These groups are best-placed to tell whether the public service is satisfactory or otherwise. They can judge from their own experience whether the service is actually functioning, effective and high-quality. However, they do not necessarily have all the information required to assess the efficiency or sustainability of performance. In many cases, the only parties with the technical skills, tools and data for comparison in

1_ Member of the United Nations Secretary-General's Advisory Board on Water and Sanitation (UNSGAB), President of the International Federation of Private Water Operators (AquaFed), Vice-President of the French scientific and technical association for water and the environment (ASTEE).

2_ Professor at Ponts-Paristech Engineering School, Deputy Director of Hauts-de-Seine Council, President of ASTEE.

3_ See *Les besoins en eau potable dans le monde sont sous-estimés : des milliards de personnes sont concernées*, G. Payen, in *Le Droit à l'eau potable et à l'assainissement, Sa mise en œuvre en Europe*, Smets et al., Académie de l'Eau, 2011.

4_ On World Water Day, 22 March 2011, Mr Ban Ki-moon, UN Secretary General, cited figures published by AquaFed in September 2010: *Over the past decade, the number of urban dwellers who lack access to a water tap in their home or immediate vicinity has risen by an estimated 114 million, and the number of those who lack access to the most basic sanitation facilities has risen by 134 million. This 20 per cent increase has had a hugely detrimental impact on human health and on economic productivity: people are sick and unable to work.*

assessing these other aspects of service performance are the players working in the complex service delivery chain.

So who are these players? There are many parties involved.

First, there is the public authority responsible for organising the service, often a political body, meaning it is directly or indirectly appointed by the people. There may be several such authorities if the service is unbundled, for instance where one body is responsible for wholesale drinking water production and another is responsible for local distribution, as is the case in Portugal.

There are also funders and "regulators" who contribute to organising and monitoring public water and sanitation services: legislative bodies and authorities that lay down rules, standard-setting bodies (responsible for health, environmental, technical and social standards) and all sorts of other inspection bodies whose role is to enforce the regulations.

The players also include the public or private bodies that work on behalf of the public authorities to implement public policy on drinking water or sanitation.

And there are also those institutions and bodies that contribute to a particular aspect of the service, for instance the social services that provide funding for poorer users, and the representatives of the various stakeholders: users, citizens, trade unions, etc.

Because there are so many players[5] that contribute to service governance, the performance of the public service is only satisfactory if each of these players is efficient and effective in its own role and if the sum of the actions by each of these players contributes to the expected service. In other words, governance needs to be established by and between the players using clear guidelines or practices. This is rather difficult to achieve. The efficiency of each player in its contribution to the public service is difficult to assess, particularly when it depends on the work of the other players. Moreover, since each situation is unique, it is difficult, as we shall see, to draw inspiration from comparable situations elsewhere. There are many situations where one player's actions can hinder the work of another. Examples include irrelevant regulations and pedantic inspections, or insufficient regulation and complete indifference, allowing operators to flaunt any objectives that are not aligned with their own interests; funding authorities of opposing political persuasions; operators left with no guidance or resources or without the infrastructure investment promised by the authorities; local authorities with only limited financial resources due to national constraints (public spending controls, budgetary priorities, failure to share risk exposure, anti-graft campaigns etc.); users discharging toxic waste or illegally sourcing their water (as is frequently the case in Jakarta, for example). The performance of a public drinking water or sanitation service can thus be considered satisfactory if three conditions are met:

- Governance of the sector is good, meaning that each player is able to fulfil its role fully and in a way that is useful for the public service, without external hindrance or obstacle, taking into account the diversity of individual situations and optimising the overall costs, measured, for instance, in the average costs to users,
- Each player fulfils its role efficiently in practice, meaning that its contribution to the collective effort is optimal, including its economic contribution,
- The service is delivered effectively, in line with the expectations of users, taxpayers and beneficiaries, and in compliance with societal and environmental requirements.

Key players for performance: the operational chain

Local and national authorities are at the heart of this issue of performance, because they are in control of the decision-making process. The authority responsible for organising the public service on a local level is clearly in the front line. This body is responsible for setting targets and timetables, particularly with regard to the people or places to be served. It defines the means to be used – organisational, human, financial, technical, legal or pricing resources or mechanisms. It also has a role in drawing in (or otherwise) the other players, decides how to involve users, how information is to be circulated and chooses the operators, etc. If this body's policy is clear and supported by a long-term vision, its own resources and the other players can act effectively. Without this type of policy, service performance suffers.

In many cases, national authorities calibrate the financial, legal and human resources that can be used by the authorities responsible for local service provision. There are many countries with so-called "decentralised" management, where local authorities can only access the financial markets if they are supported by the Ministry of Finance (e.g. via pooled loan programmes) or can only invest through at least partial regional or national subsidies (this is the case in France, with Water Agencies that are organised by large catchment area). In addition, the training and education of managers and technicians to work in the various specialised aspects of water management is beyond the scope of local action (except in the biggest cities) and has to be organised on a much larger scale.

Operators commissioned by the public authorities implement the public policy set by the organising body. Depending on their competence and experience, the performance of these operators varies significantly. However, this depends firstly on what they are commissioned to do. Operators cannot legitimately take the key decisions on behalf of the public authority – decisions regarding objectives, financial resources, prices, service priorities, water quality, etc. It is essential for the performance of the public service that a contract establishing objectives and means be in place between the responsible public authority and the operator, whether public or private-sector. This performance contract

5_ The OECD report *Water Governance in OECD Countries: A Multi-level Approach* lists the public authorities involved in this field in each OECD country. In x% of the 17 countries studied, there are more than ten such bodies.

or service level agreement, gives the authority a framework for setting out objectives, making available the appropriate resources and stating how it will monitor the outcomes. These aspects are often forgotten if the authorities' own means are used and there is no contract in place.

None of this is specific to any one situation. Public authorities have similar and equally crucial roles in both developed and developing countries. Neither is this specific to a particular type of operator. Whatever the precise situation, the responsible public authority needs to set out its policy, objectives and principal means and to monitor whether its operator or operators are actually delivering the required services. If there is a weak link anywhere, the performance quality of the service provided to users, taxpayers and beneficiaries is affected.

Measuring performance

It is not easy to provide an objective performance assessment for a public water or sanitation service. This is where key performance indicators (KPIs) come in. KPIs provide very important information that can be shared between players and with all the relevant stakeholders. They contribute by providing objective measurements, encouraging better performance from each of the players (who each get a better idea of their respective impact) and fostering transparency with regard to effectiveness of the service. A large number of indicators is often used by the various players involved in a service, because the issue is to reflect a complex reality. However, there should not be too many, otherwise instead of simplifying collective perceptions, they will end up forming a smokescreen.

KPIs are essential tools but they must be used wisely. A good score for one indicator that only gives a partial description does not in itself mean that the performance of the service as a whole is good, particularly when economic efficiency is judged to be optimal. For instance, criteria relating to payroll costs or staff numbers can be analysed as a reflection of the service operating costs but can also be interpreted within the general employment context.

The most accessible aspect is the effectiveness of the service at any given time. This can be measured by an array of technical indicators that give a fairly good depiction of the service delivered to users: coverage, pressure, water quality, user relations, etc. In contrast, it is often difficult to measure service not provided, in other words the reality experienced by people who have no access to the service, but who should be the focus of the government's attention. Statistical systems will only highlight this 'excluded population' if they are specifically designed for this purpose. Service effectiveness indicators only give an overview. They are often difficult to interpret with a view to drawing conclusions about operations. Is the inadequate outcome caused by inefficiency on the part of one player, several players, by difficulties in the relationships between parties, by poorly defined policy or all of the above?

There are very few indicators showing the performance of national authorities or regulators with regard to the bodies responsible for local services. Budget realisation ratios for the sector are often available. These ratios between actual spending and the annual budget often does little more than measure the impact of financial regulation by the Ministry of Finance. In contrast, information on the observance and relevance of standards, inspection performance and follow-up on reported breaches is rarely recorded.

An important indicator on a local level is whether or not a multiannual programme with financial planning exists. User satisfaction surveys can provide vital information that can feed into discussions in consultation bodies. The rate of unpaid arrears or illicit connections to the network should be monitored by the local authority, and this information often highlights the extent to which pricing policy is appropriate to the social context, or the prevalence of corrupt or poor administration at least as much as the operator's own performance indicators do.

A very efficient operator can provide a poor service and vice versa. This may be the case, for instance, if insufficient resources are allotted to the operator by the responsible authority or if a new operator inherits a difficult legacy. Although there may be exceptions, comparisons of a specific place over time gives a much clearer indication of an operator's performance than comparisons with another operator at one particular time. In individual situations, this comparison can be based on local ad hoc indicators that are designed for this purpose at the start of the performance period. However, comparison over time only gives an indication of relative performance, because everything depends on the means allotted over the period by the responsible public authority.

Comparing price and service effectiveness between two different cities can give some useful indications, but unless there is an unusual case of very similar technical, historical, financial and regulatory conditions, this method cannot easily be used to compare the economic efficiency of the various operators.

Some stakeholders are reluctant to publish details of their own performance. For instance, despite repeated requests from the United Nations Secretary-General's Advisory Board on Water and Sanitation, most public development funding bodies do not publish either the number of beneficiaries of their aid or their capacity to attract other sources of funding (leverage). This statement also applies, more seriously, to situations where there is corruption and the information provided does not reflect reality, but is significantly falsified.

These problems do not mean that performance indicators are useless. They are a vital tool for facilitating dialogue between stakeholders, for supporting a policy with evidence or for setting objectives for an operator. However, it is important that the meaning of each indicator is properly understood in order to avoid incorrect interpretations. One interesting example is that of indicators of drinking water access around the world, which could be described as service effectiveness indicators if ever there were any. Although each country uses several indicators of

access, over the last ten years the international community has tended to focus solely on the indicator used for the Millennium Development Goal on a worldwide level, because it is the only one available. Despite the fact that this indicator is designed without any way of measuring whether water used is safe to drink, many stakeholders are convinced that it measures access to drinking water and repeat that 900 million people are without access to safe drinking water across the world. This error of interpretation has serious consequences, because it significantly underestimates the needs. Rather than 900 million people, there are billions – at least 2 billion but probably 3 to 4 billion people – who do not have water that is genuinely safe to drink[6].

Building capacity

Although performance measurement is one useful tool for improving performance, the fundamental issue is the competence of the relevant players. Skills are not innate, they are acquired through training, sharing good practice and discussions between stakeholders. The resources available to local authorities in countries that have recently decentralised their powers are very insufficient with regard to their responsibilities, which means that their ability to direct their operator is likewise insufficient. In the same way, local operators that "learn on the job" struggle to cope with the requirements of new standards. This is not solely a question of financial resources, because staff numbers may be high, but without the specialised skills required to face up to health issues that are often difficult to manage. The introduction of subsidised rates (social pricing) requires social conditions surveys, objective measurements and an assessment and follow-up system which are often lacking. This requires specialist skills. Finally, user perception of the service and the collective efforts required for it to operate (payment, legal connection to the service, quality of connections, acceptance of the concept of paying a significant part of the price to fund the renewal of the network facilities) requires information to be shared and permanent dialogue to be in place.

> To improve the performance of water and sanitation service, stakeholders must therefore have high levels of individual performance and be able to work efficiently together.

6_ 3.4 billion people use unsafe water at least some of the time. See reference 3 above.

BOOK **PRESENTATION**

Guillem Canneva[1]

This book intends to present a large number of examples of performance improvement in water services in various contexts. They are meant to encourage the reflections of the stakeholders involved in the governance of these essential services, to be template for further implementation in other contexts or to contribute to building innovative solutions. After the preface and the introduction, **the first part** deals with the definition of water service performance, its institutional framework and the tools contributing to it. This part lays the foundations on which the cases presented in **Part II** are based on.

If performance can be defined as reaching the expectations of stakeholders, the fact remains that these are diverse and sometimes contradictory. The modes of interaction of the various stakeholders shape the governance. The first group of contributions shows the complementary views of actors. H. Bégorre specifies how the treaty of Istanbul encourages local communities to get fully involved in the management of water services. A. Akhmouch summarizes the investigation made by the OECD in 2010 about the water governance in 17 countries, pointing up the mobilized mechanisms. P.-A. Roche and P. Marest introduce ASTEE's proposals to improve the services performance using a more effective governance. R. Simpson describes the different mechanisms of participation of the water service users in the service governance, from information to active participation in decision making. In developing countries, institutional donor agencies promote a renewal of water service governance toward more efficiency; A. Blanc et al. clarify the view of AFD (French financial institution and development agency). The governance is one of the sections covered by ISO standards on public water service management. N. Drault explains how these standards can be implemented and how they can help clarifying the definition of the performance expected from the operator. The principles of governance are relevant for both services with direct and delegated management. M. Souquière develops the case of the public management of drinking water in Paris while O. Brousse presents the case of the delegated services.

The Water services governance is usually formalized in an institutional regulation framework, in most cases defined nationally. G. Canneva offers a review of the national regulation systems where experiments of service improvement are taking place. The regulation model of French water services is introduced in detail by A. Savignac.

Finally, this section points out several methods that contribute to improve the performance in various contexts. "If you can not measure it, you can not improve it" noted Lord Kelvin. The performance indicators are therefore a fundamental tool developped and disseminated by the International Water Association (IWA). H. Alegre and M. Salgado summarize the nearly 15 years of efforts that were necessary for developing this tool.. These performance indicators were then reused in various contexts for many uses. G. Canneva and al. present an example of use in the case of a national performance monitoring system in France. In addition, M. Salvetti shows how they can contribute to conduct a cost analysis on quality and non-quality. Performance indicators are not however the only tools available: there is also, for instance, dialogue with the users to better understand their expectations and anticipate any changes. R. Barbier and M. Tsanga show how it can be mobilized. Other tools can improve the management of operational activity. C. Franck relates the case of Vivaqua's Balanced Scorecard in Belgium and M. Riotte the case of sewerage management in the region of Paris. Finally some tools aim to improve the coordination of the stakeholders' actions by helping them share their goals. This is the case of management contracts presented by C. Mairesse and output based aids (OBA) in the French sanitation sector described by J.-F. Curci.

The **second part** presents case studies of performance improvement. Though not exhaustive, it provides examples of tool implementation in various contexts. These examples were grouped into three categories.

Firstly, we focus on performance improvements through coordination arrangements between operators and authorities. Thanks to performance targets and monitoring, authorities managed to make their expectations clear to operators. A. Guillon et al. mobilize performance indicators in monitoring sewerage management in Paris suburbs. In addition, performance indicators are increasingly being incorporated into contracts between authorities and operators, for instance in the case of SEDIF's[1] new contract (A. Cohen et al.), or for some Lyonnaise des Eaux contracts (S. de la Grand'Rive) or also in Jeddah Water Service contract (C. Mairesse and A. Mathys). Monitoring is not implemented only in developed countries or for large contracts. D. Désille and D. Faggianelli show how this system can be effective for small operators in Africa. Finally, these coordination mechanisms can be implemented in hybrid governance cases,

1_ AgroParisTech, joint research unit G-Eau, Montpellier (France)

as in Bucharest, presented by E. Chiru or in Nantes Métropole, presented by P. Marest et al.
Another set of cases deals with service improvement based on benchmarking and best practice exchange. Contributions present the case of the participation of Eau de Paris to the European benchmark (B. Sixta) and the analysis coordinated by the FNCCR in France (C. Bougaux-Ginsburger and M. Desmars). These tools are not restricted to high quality standard services. In developing countries, projects such as those presented by M. W. Blockland on the one hand and M. and D. Mehta on India in the other hand, consist of adapting the indicators commonly used and initiating a benchmark. Finally, C. Brenière et al. provide a framework for practice exchange between operators (water operator partnerships).
In the third group, the examples are based on capacity building and asset management. If water utilities mobilize expensive infrastructure, they can not function properly and improve without paying attention to skills – and especially those of their managers – and to asset knowledge, including networks, which allows optimized management. P. Vizioli introduces WIKTI, a methodology for know-how transfer between operators within a group and J.-A. Faby presents the International Executive Master Water for All, a training program for managers of water services in developing countries, designed as a lever of change and performance. Asset management is based on tools and skills, such as those used for in the sanitation service of Caen-la-Mer (K. Nirsimloo et al.) but also in the drinking water service of Shanghai, in a context of rapid development (L. Pelletier), and of Bordeaux (C. Anselme and F. Figueras).

Finally, the water service performance is part of a long-term vision and articulates with the challenges of sustainable development and urban integration. Services face inertia related to the long life of infrastructure and changing stakeholder expectations, which leads to a changing definition of performance over time. This tension between inertia and the need for flexibility shows the importance of supplementing the performance tools described above. The book proposes, in a **third part**, some reflections on sustainability. O. Gilbert et al. are particularly interested in the social policy aspects of access to water for poor populations. B. Barraqué introduces a research project analyzing the sustainability of drinking water services according to economic, environmental and ethical dimensions. F. Cherqui et al. offer an analysis of the functions of urban water management to better assess their contribution to sustainable development. Finally, J. Laterrasse and S. Zerguini present a methodology for assessing urban services in terms of their impact on climate change.

The book concludes with a summary of the proposals of TSG members. These will be promoted at the World Water Forum in Marseille, to encourage the implementation of actions toward improving performance.

1

Definition of the services performance, its institutional framework and tools

The Istanbul Water Consensus and the performance of services

Interview of Henri Bégorre, mayor of Maxéville and vice president of the urban community of Grand-Nancy (France)

THE ISTANBUL WATER CONSENSUS WAS DRAFTED AT THE 5TH WORLD WATER FORUM IN 2009 WITH THE AIM OF HELPING LOCAL AUTHORITIES TO DEVELOP WATER MANAGEMENT STRATEGIES THAT ARE BETTER ADAPTED TO THE CLIMATIC CHANGES ON OUR PLANET. THE TEXT HIGHLIGHTS THE SHARED COMMITMENTS THAT MAYORS AS WELL AS LOCAL AND REGIONAL AUTHORITIES HAVE AGREED TO RESPECT.

As the mayor of Maxéville, you were among the first to sign the Istanbul Water Consensus during the World Water Forum in 2009. Why did you support this initiative?

The primary mission of all the world's mayors is the organization of basic services. Ensuring universal access to clean water, protecting resources, and keeping cities clean are priorities for local officials.

The wording of the Water Consensus is useful and contributes to this aim by promoting shared principles and actions on a planetary scale. For example, the Consensus promotes the participation of citizens, the transparency of governance-building measures, and a basic understanding of changes that must be made in the way water is used.

What does the Consensus say about performance?

The Istanbul Water Consensus stimulates water service performance improvements by admonishing signatories to implement the measures necessary to meet the "targets" they set for themselves.

However, it does not impose binding targets; it is up to the signatories to set their own targets that reflects their own particular socio-geo-economic context. The performance assessment criteria are specific to each signatory. Thus the basis of the Consensus is a moral commitment, not a quantitative one. In France, intermunicipalities often have water and wastewater responsibilities, but mayors maintain close relationships with the inhabitants. The Consensus has afforded me an opportunity to step back and take stock of the situation and better meet local demands.

Two-thirds of Maxéville is made up of social housing and it also welcomes Travelers in the urban area. The issue of social tariffs is, of course, topical.

What is the aim of the Consensus?

The Consensus encourages communities to assume their responsibilities when it comes to providing services to users, but it also encourages citizens to make good use of water, all while taking into consideration geographical and cultural contexts.

The World Water Fora, like that scheduled in Marseille, represent staging points for reviewing the progress of the signatories. They encourage signatories to act and provide a platform for exchanging experiences.

Specifically, how have you implemented this in Maxéville?

It is the Grand-Nancy urban community that is responsible for managing water and wastewater services for Maxéville and 19 other municipalities.

Regarding the commitments we have made in Maxéville to the Istanbul Water Consensus, the main thrust is promoting the participation and the awareness of users (we are working to make users more aware of the water cycle, the cost of water per m^3, or even the use of water and alternatives like the recycling of rainwater), then we are working to anticipate the future adoption of national regulations (the recycling of treated wastewater or stormwater, for example), and finally, we are striving to improve the performance of public water and sanitation services.

Also, we have made a commitment to assist the city of Gao (Mali) in a decentralized cooperation project. This commitment involves working together on the governance of sanitation services with a highly participatory approach that was initiated by the Gao city hall. In Maxéville, this participatory approach is reflected for example in the schools, where studies on the use of water in France and elsewhere

are being conducted.

Working together, as Maxéville and Gao are doing, is a win-win situation. Supporting the Gao city hall strengthens it as a local, organizing authority. The involvement of families and schools has greatly improved sanitation levels, which has in turn brought improvements to the entire waste cycle. This question has even come up in our eco-neighborhood social housing! And young people from the two cities are sharing their projects to protect the environment.

In short, we have seen real social ties develop in each city of course, but also between peoples from very different horizons. What more could a mayor ask for?

> See Annex 1 p. 177

IMPROVING THE OUTCOMES AND PERFORMANCE OF WATER POLICY: **AN OECD PERSPECTIVE**

Aziza Akhmouch[1]

KEY WORDS: multi-level governance, performance measurement, indicator, assessment, information system

The "water crisis" is largely a "governance crisis"

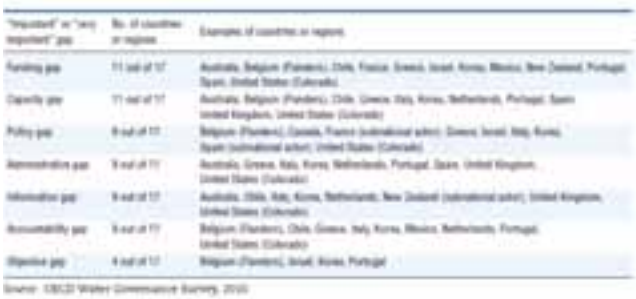
Managing water for all is not only a question of hydrology and financing. In the absence of effective public governance, policymakers inevitably face obstacles to effectively designing and implementing water reforms. Key challenges include territorial and institutional fragmentation, limited capacity at the local level, unclear allocation of roles and responsibilities and questionable resource allocation. Patchy financial management and the lack of long-term strategic planning are also to blame, together with poor economic regulation and poorly drafted legislation. In addition, insufficient means for measuring performance have largely contributed to weak accountability and transparency. These obstacles are often rooted in misaligned objectives and poor management of interactions between stakeholders.

OECD previous work on water concluded that the solutions to the water crisis do exist and are well-known. The real challenge is implementing these solutions, tailoring them to local contexts, overcoming obstacles to reform and bringing together the main actors from different sectors to join forces and share the risks and tasks. There is no one-size-fits-all answer, magic blueprint or panacea to respond to governance challenges in the water sector, but rather a plea for home-grown and place-based policies integrating territorial specificities and concerns. But whatever countries' institutional contexts and settings, common challenges can be diagnosed *ex ante* to provide adequate policy responses.

In 2010, OECD carried out a survey throughout 17 member countries to identify good practices for managing interdependencies between the many stakeholders involved in water management and look at the processes through which public actors articulate their concerns, decisions are taken and policy makers are held accountable. The main findings were published in the report "Water Governance in OECD countries: a Multi-level Approach", which provides a "reading template" to: i) map the allocation of responsibilities in water policy design, regulation and implementation; ii) identify common multi-level governance challenges for integrated water policy; iii) suggest the main policy responses for managing mutual dependencies across levels of government in water policy design and implementation; iv) promote decision-making that integrates actors at all levels; and v) encourage the adoption of relevant capacity-building, monitoring and evaluation tools.

Highlights from the report "Water Governance in OECD Countries: a Multi-level Approach"

IDENTIFYING MULTI-LEVEL GOVERNANCE CHALLENGES IN OECD COUNTRIES



The degree to which effective co-ordination and implementation of water policies is compromised by multi-level governance gaps varies widely in the OECD region, but common challenges have been identified:

- In two-thirds of OECD countries surveyed, the *funding gap* is the main obstacle to vertical and horizontal co-ordination of water policies;

1_ OCDE

- Despite the well-developed infrastructure and the regular transfer of expertise;
- The *capacity gap* is the 2nd most important challenge – especially at the sub-national level;
- Two-thirds of OECD countries covered in the study still face a *policy gap* because of the fragmentation of responsibilities at national and sub-national level and the lack of institutional incentives for horizontal co-ordination between different policy fields;
- The *administrative gap* still has a significant impact on water policy implementation, even after the adoption of river basin management principles;
- *Information* and *accountability gaps* are major obstacles to integrated water policy in half of the OECD countries surveyed.

Actually, on this last point, the lack of accountability and transparency in water policy is a symptom of governance deficiencies both in the private and the public arenas. In many countries, enforcement of legislation is weak and judicial systems are inadequate. This is detrimental to sustainable water provision in many ways. It reduces economic growth, undermines performance and effectiveness, discourages investments and frustrates stakeholder participation in the decision-making process.

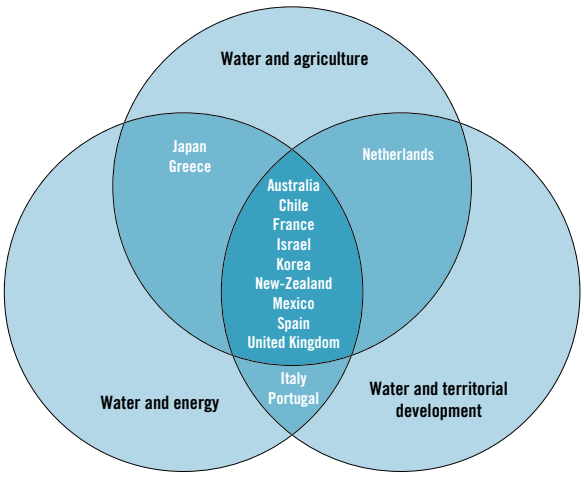
Generally, the main issues relate to a lack of public concern and low involvement of water users' associations in policy making. Poor evaluation of water policies at central and sub-national level are also pointed out, and inadequate monitoring, reporting, sharing and dissemination of water policy performance prevents policy coherence at horizontal and vertical levels. Periodic assessment of progress toward established policy goals is vital for understanding whether the applied efforts are effective and for adjusting policy where necessary. But feasibility is often limited due to considerations of political, financial and capacity nature. For example, in Greece, Israel and Italy, the absence of monitoring and evaluation of water policy outcomes were considered as important obstacles to the implementation of water policy at the territorial level. In Israel, outcomes of national water policies are not always quantified in a timely manner, due to difficulties in obtaining the relevant data from the Israeli Water Authority database. A complete reorganization of the database is needed to provide clear results from policy changes. In addition, no incentives or specific rules exist to encourage companies responsible for pumping, purifying and transporting water to consumers, to produce relevant data on the quantity and quality of the transported water and the remaining water reserves. The idea was mooted of setting up a separate independent monitoring team to collect such data, but is now in standby because of insufficient funding.

POLICY RESPONSES TO OVERCOME MULTI-LEVEL GOVERNANCE CHALLENGES: A FOCUS ON PERFORMANCE MEASUREMENT

Most OECD countries have made significant efforts to co-ordinate water policy across ministries, policy areas and between levels of government.

All countries surveyed have set up horizontal *coordination mechanisms* such as line ministries (e.g. UK, Spain), inter-ministerial bodies (e.g. France), high level structures (e.g. Mexico) or specific co-coordinating bodies. Performance measurements, river basin authorities, water information systems and databases, financial transfers, inter-municipal collaboration, citizen participation and innovative mechanisms (terriotrial experimentation) are important vertical coordination tools in OECD region;

Horizontal co-ordination across policy areas



Source: OCDE water governance survey (2010)

Building capacity and facilitating co-ordinated actions across levels of government can be achieved through performance measurement. Such measurement aims to provide information that can be used to enhance the effectiveness of decisions on policy priorities, strategies and resource allocation (OECD, 2009). It usually takes place through monitoring and evaluation. *Monitoring* is an ongoing process and requires collecting and assessing both quantitative and qualitative information, and building a picture of the functioning and outputs of public policies and programmes. *Evaluation* occurs at specific moments in the cycle, and uses qualitative and quantitative data to assess whether or not objectives have been met. Both can help identify areas where co-ordination can be improved; support dialogue and negotiation for better allocation of resources or competences, and facilitate negotiating contractual arrangements.

Performance indicators can reinforce linkages among policy stakeholders at different levels of government and contribute to learning and capacity-building. Such measurement becomes an invaluable tool for all levels of government, as well as for the

other stakeholders in a multi-level governance context, including private water operators. It is a basis for dialogue, discussion and acquisition of knowledge, and helps a community of actors identify common reference points. But a key concern is to what extent such information on performance is used to guide water policy decision-making and prioritise government actions.

A growing number of countries have established indicators for assessing the performance of their water sector, reinforcing incentives for sub-national governments and improving the knowledge base. Several OECD countries have also adopted tools to measure progress in water policy implementation though monitoring systems are not always standardised across basins, and information is not systematically made public (e.g. to water users and NGOs) or used for benchmarking bodies in charge of water policies that guide public decisions. The following examples illustrate some interesting experiences in the OECD region.

PERFORMANCE INDICATORS IN THE WATER SECTOR: SOME OECD EXAMPLES

In **Australia**, the *National Water Commission's* Biennial Assessment of the implementation of the National *Water Initiative* reports progress in water reform at the sub-national level.

In **the Netherlands**, each Water Board uses systems to monitor progress in water policy, such as monitoring water quality and (water) ecology, planning and monitoring of space that is set aside for water retention. The STOWA (institute of Applied Scientific Research) is leading the drive toward standardisation of monitoring systems for water quality, water quantity and ecology. The Union of Water Boards organises a benchmark of the Water Boards every two years, and the benchmark is made public in the publication *Waterpeil*.

In **Belgium**, the Flemish Environment Report (MIRA) has been published since 1994 as an Indicator, Policy Evaluation, Scenario and Forecasting report. It includes trend analysis as a basis for evaluating progress. In addition, the Co-ordination Committee on Integrated Water Policy (CIW) has developed a follow-up system on the regional level for the implementation of *Water Framework Directive* measures. This consists at present of an MS Excel or Access application containing data listing basic information (who, what, when, etc.) as well as data that follow progress (expenses, time schedule, etc.).

In **France**, the *Contrat d'objectifs État-Agences* is a national reporting tool that evaluates water agencies' policies.

In **Arizona (United States)**, a *Water Policy Monitoring and Reporting Service* was designed for municipal water resource managers, industry executives, attorneys and those interested in keeping current with the trends influencing the price and availability of water in Arizona.

In **Portugal** since 2004, all water utilities operating under concession contracts have the quality of their services (water supply and sanitation) monitored annually through a set of 20 performance indicators. This water quality regulation will be extended to all water utilities during 2011.

Finally, the European Union has also set up a methodology to evaluate water policies within its boundaries.

Source: OECD (2011)

Key lessons from OECD experience in improving performance of water policy

OECD experience revealed that indicator systems are associated with strong benefits, however certain caveats should be considered. Often, these are costly, both directly (i.e. the cost of development and implementation) and indirectly (i.e. opportunity costs and the potential for inadvertent generation of unintended consequences). They can also increase the administrative burden on the reporting organization and its staff. It is difficult to capture complexity with water data and indicators, which can lead to developing too many indicators rather than concentrating on a core group. Besides, it is tempting on the part of central government to substitute *ex ante* control of water services with performance indicators. This can lead to retaining control of how sub-national authorities implement water policy, as they will probably make choices and decisions that allow them to perform well within the parameters of the indicator system, at the expense of other elements.

The diversity of tools in place indicates that there is no optimal design for an indicator-based performance measurement system in the water sector. Its development should be a collaborative effort between the national and sub-national level, and the information it yields ought to cover inputs, processes and outputs that are relevant for ongoing activities. To use such information optimally, clear objectives for the data need to be established and proper indicators selected. Systems are needed to generate, validate and distribute the data; the information needs to be used in a suitable and timely fashion; incentive mechanisms are needed to encourage actors to follow a particular course of action; and appropriate use of the performance information must be planned for encouraging the systematic monitoring of water policies has to be clearly thought through, using the necessary databases and systems. This often means making such indicators available to all levels of government and to the public. In other words, many complementarities between governance tools need to be taken into account so as to make the most of their interaction.

The OECD report ends with tentative guidelines intended to serve as a tool for water policymakers to diagnose and overcome multi-level governance challenges and manage complexity in water policy. One of them is specifically dedicated to the necessary incentives to spur performance measurement in the water sector:

1. Diagnose multi-level governance gaps in water policy making across ministries and public agencies, between levels of government and across sub-national actors; This will help clearly define roles and responsibilities of public authorities;

2. Involve sub-national governments in designing water policy, beyond their roles as "implementers", and allocate human and financial resources in line with responsibilities of authorities;

3. Adopt horizontal governance tools to foster coherence across water-related policy areas and enhance inter-institutional co-operation across ministries and public agencies;

4. Create, update and harmonise water information systems and databases for sharing water policy needs at basin, country and international levels;

5. **Encourage performance measurement to evaluate and monitor the outcomes of water policies at all levels of government, and provide incentives for capacity building;**

6. Respond to the fragmentation of water policy at the sub-national level by encouraging co-ordination across sub-national actors;

7. Foster capacity-building at all levels of government. This implies combining investment in physical water and sanitation, or "hard" infrastructure, and providing "soft" infrastructure, i.e. mainly the institutions upon which water outcomes rely and their ability to fulfill their duties in an effective and co-ordinated way;

8. Encourage a more open and inclusive approach to water policy making through public participation in water policy design and implementation;

9. Assess the adequacy of existing governance instruments for addressing identified challenges and fostering co-ordination of water policy at horizontal and vertical levels.

References

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ASTEE'S PROPOSALS FOR IMPLEMENTING PERFORMANCE IMPROVEMENTS IN LOCAL PUBLIC WATER AND ENVIRONMENT SERVICE PROVISION IN FRANCE.

Pierre-Alain Roche[1]
& Philippe Marest[2]

KEY WORDS: efficient service, stakeholders of public services, performance measurement

The local authorities with whom we work in France have made various choices in the way they organise their public water and sanitation services, and their current structures are inevitably affected by their history. Drawing on the experience we share with many colleagues within ASTEE, we have outlined requirements for progress and common methods for these diverse situations. A general intervention framework can this be sketched out, based on the notion of a service contract, which brings significant clarifications, and a proposed plan for capacity building amongst all stakeholders.

Complexity: a challenge for local authorities

Local authorities, and municipalities and inter-municipal groupings in particular, are confronted both with the day-to-day provision of local public services and with the long-term resolution of the major challenges of sustainable development at the local level. These include environmental challenges, such as global warming, dwindling resources and biodiversity protection, as well as those issues posed by lifestyle changes. Today, it seems to be widely accepted that local authorities must be involved in the big questions of society at national, European and global levels. Such questions are at the heart of local issues, including the management of public environmental services (drinking water, sanitation and waste). It is crucial to strengthen role of local authorities, and this was highlighted in the Istanbul Water Consensus signed at the fifth World Water Forum.

The range and complexity of issues involved increasingly requires significant technical ability and a high level of engineering competence[3]. In particular, local authorities must apply statutory requirements which increasingly originate in complex European legislation (and this is especially true with respect to the environment). Undoubtedly, local authorities have developed operational abilities as contracting and organising authorities but, with the possible exception of the largest authorities, they are less well equipped to bring local responses to, and contribute to resolving, the big questions of the twenty-first century, such as social change and sustainable development.

The issues involved break down into three main areas: politico-institutional (organisational systems), economic (costs to be taken into account) and technical (technological solutions). Thus, for local public bodies, these new issues mainly concern their ability to perform their roles as public-services organising and contracting authority, which are essential for maintaining public control in a fast-changing context, and their ability to take concrete actions while assessing their impact. They must draw on diverse expertise to build a overall vision using a multi-disciplinary and cross-disciplinary approach that brings together perspectives from economists, engineers, geographers, sociologists, urban planners, architects and others into a unified whole.

Implementation thus raises multiple questions which are collective challenges that need to be met at a local level.

1_ President of ASTEE, the French Scientific and Technical Association for Water and the Environment and Deputy Director in charge of Land Use Planning, at Hauts de Seine Council.
2_ Vice-President of ASTEE for local authorities, Chief Executive Officer for the environment and urban services for the Urban Community of Nantes.
3_ Yves Daudigny: "Rapport d'information n°557 du Sénat sur l'ingénierie publique du 15/06/2010"
"The rapid increase in laws and standards, the increasing technical and legal complexity of the files, the need to take sustainable development guidelines into account and the need for plans to cover management and maintenance aspects require an increasingly high level of engineering competence".

Changes and questions must be taken into account and suitable responses found and implemented by local stakeholders.

ASTEE's proposals

In the face of these challenges for local public environmental services, ASTEE has worked with its partners to promote:

- effective organisational structures based on strong organising authorities[4],
- efficient utility operators, whether these are public, semi-public or private,
- service contracts to clarify the relationship between organising authorities and operators,
- a State regulator that ensures transparency for citizen-users.

WHY STRONG ORGANISING AUTHORITIES ARE REQUIRED

The organising authorities must be able to fully play their role. The scope of their work is wide and strategic. It includes: specifying scope and skills, analysing collective needs, informing and including the public, defining services (level and quality), selecting management systems, managing assets (resources, networks and facilities), specifying pricing methods and policy, and providing services. The appointment of the utility operator is a major decision for the organising authority. It must have the capability to understand and manage all the key elements and the ability to act effectively.

WHY ORGANISING AUTHORITIES NEED A SOLID BASIS OF EXPERTISE

To effectively carry out its roles with the appropriate level of competence, an organising authority requires significant expertise in the field. Alongside scientific and technical skills, this involves economic, social, legal and other specialists, as well as proven experience in areas such as defining strategies, managing assets, selecting management systems and supervising utility operators.

WHY ORGANISING AUTHORITIES NEED TO BE ABLE TO INNOVATE

It is necessary to prepare for the future by seeking new solutions and ideas, which are all the more essential given the increasingly constrained economic and financial context. One key strategy is innovation, not only in technology but also in areas such as services, working methods, organisational structures and logistics, in order to increase operational capacity and levels of expertise, and to seek improvements in the services delivered to the public.

WHY SERVICE CONTRACTS ARE IMPORTANT

Service contracts are the most precise and transparent means for setting out:

- the expectations and priorities of the organising authority,
- the levels of performance to be achieved, given the resources allocated, by the public service operator working for the organising authority.

WHY STATE REGULATION IS IMPORTANT

Finally, the State must play a regulatory role and ensure transparency in close collaboration with the local organising authorities that listen to the citizen-users. Local public environmental services are exceptional tools for social cohesion and provide essential services in terms of public health and comfort for daily life. This is a major political issue. In France, regulation is performed via standards (in particular standards for delegation of public services and other types of contract) and regulations, via taxation and funding mechanisms (water agencies), and via "sunshine regulation"[5] through the establishment of the French national water and wastewater services watchdog SISPEA[6].

A strong organising authority

ASTEE has drawn its long experience of public services in France to produce its proposed implementation guidelines. The French "LOTI" Act of 1982, a framework for transport systems in France, introduced the notion of "organising authority". A position statement from the French Economic and Social Council summarises French experience in urban public utilities[7], bringing together a range of research work[8]. Institut de la Gestion Déléguée (IGD, the French Institute for Public-Private Partnerships) has proposed a charter for local public services[9], which would apply to all bodies and partners, with seven targets to ensure service quality and performance. A similar charter for water and sanitation services, but with international scope and with a strong emphasis on social issues and public

4_ In this paper, the terminology that is usual in France is used. Specialists in these areas will find the following equivalents in the terminology used in ISO TC 224: for "organising authority" read "**responsible body**" and for "State" read "**competent authority**" (for France as a whole). For a presentation of the French institutional system, the reader is referred to other papers in this collection.

5_ Bruno Johannès and Pierre-Alain Roche, "Regulation in the water and sanitation sector in France ", in "Regulation of network utilities: the European experience", Oxford University Press, Oxford, 2001.

6_ See the paper on this subject in this collection.

7_ "La maîtrise des services publics urbains organisés en réseaux ", Avis du Conseil économique et social, Claude Martinand, Section du cadre de vie, 2001.

8_ Dominique Lorrain: "Gestions urbaines de l'eau", Economica, 1995.

9_ IGD, 2002. The charter was signed by four founder members and currently has about twenty signatories.

participation, was produced over the same period by the French NGO Académie de l'Eau[10] and these two charters were jointly presented during the "Rio+10" Earth Summit in Johannesburg.

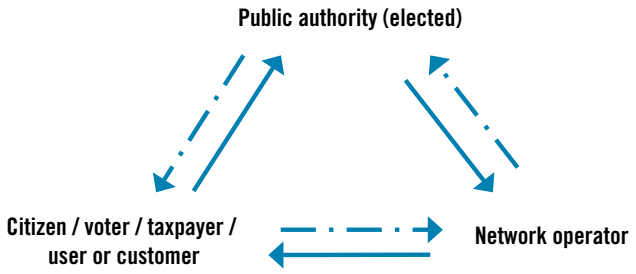
In France, urban utilities are organised on the basis of the relationship between three major stakeholders (see Figure 1):

The organising authority is the public body with the authority to organise a public service in a given area, and which ensures its correct performance in the context of current legislation. By analogy with public contracting authorities it has *a role in serving the public interest which it cannot relinquish*. As part of a whole, its actions and its public policy objective fit into a larger project and contribute to the overall dynamics of the sustainable development of the area.

The citizen-user is a citizen in relation to the organising authority and a user in relation to the utility operator. Public actions must be driven by the goal of satisfying the needs and meeting the aspirations of citizen-users in the public interest.

The utility operator is the body appointed by the organising authority to fulfil the public service mission, i.e. to deliver the service to the user, operate the network and maintain the assets made available by the local authority. The operator role may be provided by a company (outsourced to a private operator), a public body or local authority management.

Figure 1: the French (triangular) model of utilities regulation and management[11]



This vision of urban services is fully in line with European guidelines. The European Commission's White Paper on services of general interest (2004) affirms that *"the definition of public service obligations and missions remains a task for the public authorities at the relevant level"* and that these are responsible for *"ensuring that operators accomplish the public service missions entrusted to them"*[12].

The key mission of the organising authority is to organise services, which ultimately results in utilities provided for the population. The development of service provision leads to the development of utility networks and provides added value for the local area. This geographical territory is the physical backbone of the utility infrastructure, the population's geographical and administrative living space and the subject of local governance. Land development drives improvements and the creation of new services.

Tensions result from conflicts between short and long term goals, between the public interest and private interests, i.e. between responding to private problems and meeting collective needs. Other tensions result from pressures from the external context, in particular the State, which legislates, regulates and monitors. These interactions with the external environment must be managed, as must the relationships and the demands of multiple stakeholders. The organising authority must therefore ensure a balance between these three standpoints to ensure, at the same time, that the planned actions are suitable for the needs (territory), that the assets are being developed and are sustainable (infrastructure) and that the services delivered to the users are high quality (service). This balancing requires constant vigilance to avoid drift and to find appropriate responses that are consistent with the overall goal of the service. This dynamic balancing is the core task of urban-service management.

In this three-way dance with the citizen-user and operator, the organising authority must be able to fully perform its role. To do this, it must impose itself as the sole public body with a legitimate role to play establishing public-service requirements and missions, within its scope and jurisdiction, under the statutory[13] framework that specifies the range of its responsibilities and the methods for their implementation.

A "strong" organising authority must be able to manage all the key elements, have the ability to act effectively[14] and, in particular:

- define strategies to assess the **needs** to be met and anticipate short- and long-term changes therein;
- decide the **level and quality of services** and the means to be allocated thereto, and publicly commit to this;
- decide the **pricing policy**: pricing is subject to debate and is a sensitive issue for the public; the balancing of pricing with the financial resources of various users is a major element in the collective acceptability of the service;

8_ Dominique Lorrain: "Gestions urbaines de l'eau", Economica, 1995.

9_ IGD, 2002. The charter was signed by four founder members and currently has about twenty signatories.

10_ Pierre-Alain Roche and François Valiron, "La charte sociale pour l'eau", Futuribles, Special Edition "l'Eau au XX^{ième} Siècle", March 2000.

11_ "La maîtrise des services publics urbains organisés en réseaux ", Avis du Conseil économique et social, Claude Martinand, Section du cadre de vie, 2001.

12_ European commission, White paper on services of general interest, Brussels, 2004.

13_ In several French Codes, in particular Articles L.222-4 and R.222-4 of the Code Général des Collectivités Territoriales (CGCT, the French local government code of practice) and others such as the Code de l'Environnement (the French environment code).

14_ See Pierre-Alain Roche: "Régulation des services d'eau et d'assainissement", in E. Cohen et al, "Enchères et gestion publique", pp. 245-262, Conseil d'analyse économique, La Documentation Française, Paris, 2001, for further details on the information asymmetry often observed between an organising authority with insufficient data and ability, and operators with significant expertise.

- ensure utilities asset management, including equipment and infrastructure maintenance and investments associated with improvements in services, which require significant outlays. The infrastructure developed over time is a valuable collective asset which must be managed to ensure its own sustainability and that of the service itself. This is one of the key responsibilities of the organising authority, especially with respect to future generations in particular. This crucial question has been the subject of many studies and was on the agenda of an international conference organised by ASTEE in Bordeaux in October 2011[15].
- monitor **service provision**: the organising authority must be able to discuss this even-handedly with operators, to deepen their mutual understanding and benefit users.

Decisions regarding these services have significant consequences and a long-term impact on land use planning, local authority debt via infrastructure costs, the level and quality of service and, ultimately, the prices paid by the citizen-users. It is, therefore, crucial that such decisions are taken properly. The key mission of the organising authority is to *"ensure universal access"* to the public service by providing *"a solid basis that is appropriate local conditions"*[16].

An organising authority with strong, long-term expertise

These issues highlight the range of questions that the organising authority must address to effectively carry out its missions. This requires significant expertise in the field. Alongside scientific and technical skill, this involves economic, social, legal and other specialists, as well as proven experience, in areas such as defining strategies, managing infrastructure, selecting management systems and monitoring network operators. Specific skills are therefore required within local authority departments, including the ability to coordinate and produce synergies, because efficient support for elected officials in their decision-making process is based on the ability to present a clear, overall vision and to organise and manage public services in the long term.

Such expertise can only ever exist in organisations that are sufficiently large. For this reason, the creation of collaborative inter-municipal structures, bringing together the skills from various municipalities and enlarging the coverage of a single authority, has given organising authorities a critical mass, with their own resources that ensure their autonomy, and provided genuine negotiating power based on the size of the population represented. This level of cooperation has shown itself to be one of the main factors for the successful management of urban services by local authorities, *"an opportunity and a means for improving management"* as stressed in a report by the Court of Audit of France[17].

As it seems difficult to match the sizes of functional utilities provision areas and administrative units[18], questions of competencies, structures[19] and the appropriate area for their performance need to be addressed. Furthermore, the French Council of State in its 2010 report on water and water rights identified *"the balkanisation of management and structures"* as a significant problem[20]. Solutions for the sharing of resources are thus essential to ensure that the support previously provided by the State's devolved services continues to be passed on.

Effective utilities operators

Utility operators must possess and demonstrate real technical legitimacy. Whether they are is public or private bodies, their effectiveness is the key to providing the service for the user. The operators provide local contact and interact directly with the public. The content and quality of their contractual relationship with the organising authority is crucial to the service and, ultimately, for the user, as stated by a major public services operator[21]: *"In the long term, there cannot be an effective operator without a strong organising authority. It is up to local authorities to give themselves the means for monitoring service performance…"*.

The issue of local public environmental services, and urban services in general, is often approached via the following much-debated issue: *"Do it yourself or have someone else do it? Local authority management or delegation of public services?"*. The question of management systems is posed in terms of a choice of one method over another. Many studies have analysed this question in depth, looking at management systems in opposition. Overall, no system comes out as intrinsically better or worse, and experience reveals contrasting situations in favour of one system or another for identical activities.

15_ ASTEE, "Les outils de la gouvernance locale des services d'eau et d'assainissement", in partnership with the International Water Association (IWA), the OECD and the Urban Community of Bordeaux, October 2011, (not yet published).

16_ Pierre-Alain Roche: "Livre blanc des acteurs français du développement durable - chapitre Eau", published for the Johannesburg Earth Summit, Documentation française, Paris, 2002.

17_ Court of Audit of France Report "La gestion des services publics d'eau et d'assainissement", Les éditions des journaux officiels, December 2003.

18_ Scherrer F., "Figures et avatars de la justification territoriale des infrastructures urbaines", in Gariépy Michel and Marié Michel, Ces réseaux qui nous gouvernent?, 1997.

19_ Julie Niederlaender: "Une contribution pour une meilleure organisation territoriale adaptée aux enjeux d'une gestion durable de l'eau", doctoral thesis in Urban Engineering, Université Paris-Est, 2009.

20_ "L'eau et son droit", public report of the French Council of State, 2010.

21_ Antoine Frérot, "L'eau, pour une culture de la responsabilité". Editions Autrement, Paris 2009; Antoine Frérot is CEO of Veolia Environnement.

This question is clearly important but it should not obscure the key issue of the role of the organising authority. Indeed, it is less important to compare management systems – to see whether local authority management or delegation to a private operator (in the widest sense including public tendering[22]) is cheaper or more expensive – than it is to provide the organising authority with everything it needs to effectively organise the operation of public services. The issue is to choose a public or private operator, with the corresponding consequences in terms of investment, over all or part of its territory, who, as the Council of State underlines *"… should periodically be subject to a performance audit to check that the adopted management system properly addresses the concerns of users."*[23]. It also mentions that *"the political debate, which is highly focussed on the role of outsourcing, does little to hide the serious problems faced by small local-authority-controlled companies"* and shows that the question *"local-authority-controlled companies or outsourcing?"* addresses the wrong issue.

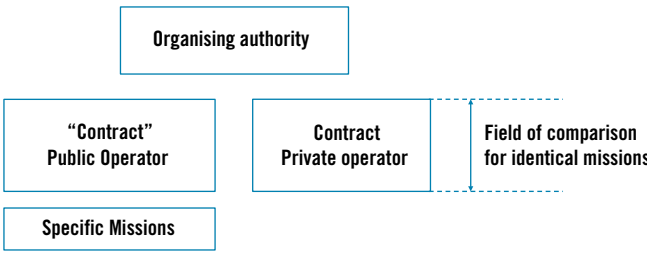
Situations may vary. One or more public and private operators may operate in a geographical area under different contracts. A sole operator raises the issue of monopoly. The presence of several private operators allows competition to come into play. Composite management systems[24] offer certain advantages, drawing on the complementarily and potential of each, enabling public and private operators to learn from each other, which promotes sustainable performance in public services and ensures that there is no monopoly.

The organising authority must make its analysis on the basis of its own geographical, environmental, economic, social and political context. This choice must also be guided by the requirement that the management system be freely chosen by elected officials and, therefore, by reversibility conditions which must be able to operate in both directions, despite current statutory frameworks that do little to facilitate this reversibility.

Currently, operators are not comparable in their rights and obligations regardless of their status. However, from now on, comparison could be made on a field of identical missions for public and private operators, relating to performance of the public service (Figure 2):

- at an equivalent level of service provision specified by the organising authority;
- when quality of service provided is measured on the basis of common indicators and strictly identical methods of calculation used for objectivity;
- when the cost of service provision includes only those services that are specific to operators and the specific missions of public operators. Costs associated with the performance of organising authority functions are to be identified and separated from operator costs;
- financial criteria must be compared over the long term, to include adequate levels of long-term investment. Indeed, it is clearly always possible to obtain favourable terms-of-service or highly competitive costs over the short term.

Figure 2: a comparison between operators over a field of identical roles



A management-system-neutral service contract

The functions of organising and contracting authority must be clearly separated from that of operator or lead contractor to prevent role confusion and better target the necessary expertise. In the case of local authority management, clarification of the relationship between the functions of organising authority and utility operator must be as clear and strong as for an external body. In other cases, the organising authority must have sufficient expertise to make informed and independent choices, and establish a constructive, even-handed dialogue with its operators. It must not find itself in a situation of information asymmetry with respect to its operators.

The formalisation of the service operator function means that the missions of all public and private operators can be specified:

- perform the service for the user, as specified by the organising authority;
- maintain the assets made available by the public authorities;
- provide feedback to the organising authority and suggest improvements for better public services.

Depending on the context, these missions are to specified in contracts or delegation agreements with private operators or in authorisations or service contracts with public operators covering service targets and resources. The benefit of formalising public requirements in specifications or clear programmes no longer

22_ In legal terms, public procurement (tendering) does not constitute delegation of public services.

23_ "L'eau et son droit", public report of the French Council of State, 2010.

24_ The analysis performed by the Urban Community of Nantes covered the benefits of the various management systems and their co-existence in the same area for water supply, wastewater network operation and domestic waste collection. It also revealed two strong points: the complementary nature of the management systems and the comparability of public and private operators, both of which, under certain conditions, have specific potentials.

needs to be demonstrated: it allows for appropriate offers to be made. The benefit of having a roadmap with specific objectives is twofold: it enables the organising authority to perform targeted monitoring and it stimulates the efficiency of the utility operators.

In all cases, performance indicators and objectives for the effectiveness of services provided to users should be of the same kind. All these provisions must, in all cases, be the subject of an explicit contract, and the organising authority must monitor, and regularly assess, the performance level achieved.

Discussions and sunshine regulation: a regulatory state and organising authorities that listen to citizen-users

Given the complexity of the issues involved, the organisation of a national data-pooling system appears to be a relevant part of the answer, both for strengthening the expertise of each structure and for developing shared expertise on the role of the organising and contracting authority.

With this in mind, ASTEE has launched an initiative formalised in partnerships with AITF[25] and ATTF[26] in particular, whose *"common ambition is to promote the provision of scientific and technical support for local authorities in the field of the environment and local public services"*.

The current situation, with the abolition as from January 1, 2012, of French State services providing technical assistance to local authorities in their role as contracting authorities or project managers, which was the subject of a Report for the French Senate in June 2010[27], and the context of changes to the Réseau Scientifique et Technique de l'Etat (the French government network of experts), makes this initiative all the more timely.

In a context of consumerism, we are all tending to become demanding consumers, because, even if we are generally satisfied, we legitimately desire to live in an environment that is conserved and protected against all kinds of risks and pollution, and to enjoy inexpensive, high-quality, transparent public services.

This change is leading to new behaviours. Indeed, people increasingly want to be involved in the development of the area where they live and in the public decision-making process. Henceforth, public management and project implementation must take place in this new context, which positions the citizen-user as a key stakeholder for land management.
To respond to this change, French legislation provides for the informing and involvement of users and local people in the life of public services, as set out in the French local government code of practice (CGCT). However, the organising authority can implement more elaborate systems for local participation, with varying degrees of involvement, both to better ensure the social acceptability of public actions and also to rely on user expertise to strengthen its actions.

This participation may be expressed via a variety of means, whether statutory (such as prior consultation and public inquiries), more creative (such as focus groups) or specifically adapted to a given project. There are also systems for encouraging local participation (neighbourhood councils, development councils), whether in relation to a single public service or a set of amenities (local water commission or consultative commission for local public services).

The participation of citizen-users brings a third stakeholder into the long-established relationship between the public authority (local elected officials), which is the organising and contracting authority for a public service, and the technical body, i.e. the utility operator or lead contractor. It highlights the involvement of local people in the process of public local-area management. It is part of the expected response to these new societal demands for high-quality services, an understanding of their operation and involvement of the citizen-user who wants a say in the public decision-making process.

Innovation: a fast-track to new ideas and answers

As well as an effective operational structure, the ability to offer quality of life and high-level public services also assumes that future public demands and expectations, and socio-economic changes can be anticipated, in order to propose the necessary changes to respond to collective needs and an increasingly tough economic context. New answers and ideas are indispensable. One key strategy is innovation[28], not only in technology but also in areas such as services, working methods, organisational structures and logistics, in order to increase operational capacity and levels of expertise and also to seek improvements in the services delivered to the public[29].

25_ Association des Ingénieurs Territoriaux de France (AITF, French association for local-authority engineers).

26_ Association des Techniciens Territoriaux de France (ATTF, French association for local-authority technicians).

27_ Yves Daudigny: "Rapport d'information n°557 du Sénat sur l'ingénierie publique du 15/06/2010".

28_ Philippe Marest and Jean-Philippe Torterotot: "Mobiliser collectivement les maîtres d'ouvrages": in "Services publics de l'environnement, Réussir la mutation des métiers", p 133, ASTEE, 2010.

29_ Bernard Chocat and Jean-Philippe Torterotot: "Recherche, innovation" in "Services publics de l'environnement, Réussir la mutation des métiers", p 130, ASTEE, 2010.

However, to innovate, expertise and resources are required and these are difficult to mobilise at a local authority level. Furthermore, there is no organised nationwide structure, along the lines of the government network of experts.

How, then, can a "piece of research" be outsourced to become a driver and source of ideas for innovation? The idea is to try and develop synergies between the world of research and local stakeholders, by drawing together potential (the research abilities of academics, the field experience of practitioners and the logistic capabilities of local authorities) into shared projects, drawn up together, to promote the emergence of knowledge and its transfer to the local authority. In a nutshell, this means developing innovation *via* research partnerships.

Partnerships could be built on programmes with projects focusing on concrete concerns associated with the missions performed by the services: technical subjects, techno-economic analyses or social aspects (citizen-user participation). This shared research system would be jointly managed. Research partners would be responsible for the scientific approach, while the local authority would provide its field knowledge and logistical support. Projects could be shared between several local authorities and several research partners, at local, national and international levels. The partnership could take a variety of forms, such as agreements, subsidies, *convention industrielle de formation par la recherche* (CIFRE, French government subsidised doctoral research in industry) or European projects.

The commitment to such an approach will contribute to responding to needs and to improving the services delivered to the public – in particular, easier universal access to public services – by increasing operational capacity and expertise, by learning new working methods and by transferring knowledge to field staff, in particular *via* regular contact with researchers. It will contribute to making the localities more attractive via high-quality public services, by stimulating local research in local institutions, by bringing in national-level researchers in the relevant fields and by involvement in international projects. Finally, it will foster strategic thinking by providing new knowledge about the territory and the way it operates.

Furthermore, for field staff, involvement in projects of this nature means that they will remain up to date on a given subject. It will give them the opportunity to bring in new ideas and for the way it operates to be part of a process of innovation. Close contact with practitioners will mean that researchers can pose new questions, generating new ideas and leading to scientific advances. Responding to operational questions in this way, not only involves a joint effort between scientists and practitioners, which will lead to shared ownership of shared results, but also (when the issue is relevant) involves a joint effort between various disciplines and specialisms, which will promote cross-disciplinary collaboration.

Local authorities have already built partnerships with many scientific and technical bodies, at local, national and international levels, in particular with higher education and research institutions, universities and the high schools. These partnerships have been developed by grouping those involved into shared programmes on practical research projects. Authorities can also draw on the support of a wide range of relevant associations.

Conclusion

Local public environmental services (drinking water, sanitation and waste management) are a key factor for the sustainable development of our communities, due to the issues they entail.

Since 2009, ASTEE has been committed to strengthening its efforts to support local authorities in local public environmental services, in partnership with the major associations of elected officials and local authority engineers and technicians, by promoting the strengthening of the role of the organising authority, which is devolved to local authorities, and by enhancing the European and international involvement of local authorities.

In the current context of questions over the future of public services, ASTEE's vision, based on implementation proposals that have already been tested at a local level[30], opens new perspectives by offering an original and innovative framework for public governance of these services. The local organising authority, when given the resources required to exercise its role, takes centre stage as the coordinator or "conductor" of their governance, whose action is not limited to monitoring obligations and market rules as a regulator, but is also engaged in social, economic, environmental and citizenship fields[31].

On the international scene, by committing to this theme in the preparation for the 6th World Water Forum in Marseille in March 2012 – and also by its contributions to the working groups of the International Water Association and the International Organization for Standardization, and by its commitment to decentralised cooperation – ASTEE is seeking to contribute to the creation of new institutional and organisational responses for urban public service governance, consistent with the needs of the public, which should lead to the design of new technical solutions.

30_ Maurice François and Philippe Marest: "Services publics urbains : le triptyque autorité organisatrice, opérateurs, citoyens-usagers", Pouvoirs locaux No. 71 III/ December 2006.

31_ Semaine juridique No. 25 (June 2011), Contribution à la réflexion sur le rôle d'autorité organisatrice des services urbains par les collectivités territoriales et sur les conditions d'une mise en pratique de ces services au niveau local.

CONSUMER PARTICIPATION AND **SERVICE PERFORMANCE**

{ Robin Simpson[1]

KEY WORDS: information, consultation, publication, participatory budget, satisfaction survey

The position of Consumers International[2] on consumer participation in the running of the water service is the following: *"Consumers should be involved in the regulatory process, including in both establishing and implementing of these regulations. Stakeholder involvement should start with the assessment of needs and objectives and the analysis of possible utility management models to meet these. The provision of full and timely information is essential for effective stakeholder involvement at all stages." The principle seems clear enough. How is it to be applied in practice and how are the results to be evaluated? The answers are not simple.*

Introduction

It is arguable that the performance expected by consumers varies according to the context of service development. There may well not be a monolithic consumer interest, but rather different interests for different sections of the population. One must therefore identify the different interests and seek out a consensus or maybe serve several interests at the same time. This can be complicated.

In Europe where approaching 100% of the population have a connection to a formal service, one major expectation of consumers is already taken care of: a connection. But in many parts of the world this is not the case. For non-connected consumers the tariff level is of less importance because they already pay considerable sums either in terms of cash paid to vendors, or in terms of time spent gathering water, and do not benefit from tariff subsidies for the obvious reason that they are not connected. However, as soon as they are connected, their interest may change towards paying a lower tariff. The expectations of users therefore vary as the service moves along the spectrum from service connection to service duration to product quality. Can consumer participation help to resolve these potential and actual conflicts?

Mechanisms for consumer participation

Water services have made some progress in terms of consumer participation/consultation in recent years. In the World Bank publication by van Ginneken, Muller & Simpson: *Ways to improve water services by making utilities more accountable to their users: a review*, the authors drew up the following approaches that they had observed around the world, listed in order of deepening degrees of consumer implication:

1. COMMUNITY OUTREACH AND AD HOC USER MEETINGS

Efforts by a utility to connect with its public through direct engagement. The broad objective is often consumer education, which can be a first step in building accountability is to ensure that there is an understanding of the service provision process and the roles and responsibilities of different actors within it. However, outreach can also be a tool to provide information on the utility, including works and service disruptions, and how to use complaint and consultation mechanisms. Outreach mostly is a one-way process, with information flowing from utility to the public, but it is increasingly common for utilities to move from information provision towards a two-way dialogue. Outreach can thus be a first step to consultation and can also be an inclusive mechanism that can be tailored to engage specific groups. This is commonly done in the planning of major investments. One way of doing this is for utilities to convene user meetings. Meetings can also be organized by third parties (e.g. an NGO) that invite representatives from the utility or government to respond to concerns. This is often observed in situations in which the utility does not have the capacity to initiate the outreach.

2. PUBLICATION OF PERFORMANCE DATA

This is self-explanatory but as noted above, different groups are interested in different dimensions of performance. The effectiveness of publishing performance data depends on the relevance, quality, timeliness, and format of the information provided. Publishing service and performance data on a regular

1_ Consumers International

2_ Consumers International (CI) is the world federation of consumer groups that, working together with its members, serves as the only independent and authoritative global voice for consumers.

basis is a sign of maturity in a utility and hence rather rare. Some countries have made great progress through an enforced legal requirement, an active utility association, or a regulator.

3. ON DEMAND INFORMATION PROVISION

Information provided often includes general information about the utility (such as tariffs, how to get a connection, works in progress, and service interruptions). However, consumers have a legitimate interest in having a more detailed understanding about a utility's operations and their motivations, for instance to understand if an infrastructure expansion is the only way to meet demand or if other approaches were considered. On demand information provision is normally done by utilities, but sometimes regulators or ombudsman also offer inquiry services for citizens that either provide direct responses or refer callers to the relevant utility. Providing information in understandable formats is necessarily a more complex task than simply producing utility defined data and information.

4. FORECAST SURVEYS SUCH AS WILLINGNESS TO PAY STUDIES

Consumer surveys are investigations of the behavior, preferences, attitudes or opinions of a target group sample, collected through a questionnaire. Ex-ante surveys can help government and utilities to shape future plans, such as investment plans to expand services, institutional changes and tariff changes. They can cover particular sub-groups or geographical communities within the service area or the whole service area. In this way they can be of assistance in resolving the dilemmas reported above.

5. RETROSPECTIVE PERFORMANCE AND PERCEPTION SURVEYS

Surveys can be carried out by utilities, regulators, or independent groups. Utilities can also use data collected through household surveys conducted by government statistical agencies. Consumer Report Cards were pioneered in India and have been used widely in Africa. Surveys may report on the consumers' perception of services or may provide factual information for example on hours of service per day. Retrospective survey and report cards are quite rare in the water sector. Surveys are mainly used by quite advanced utilities. Specific water report cards are rare, but water services sometimes feature in multisectoral report cards.

6. STRUCTURED CONSULTATION PROCESSES

Structured consultation procedures are often mandated by law, notably for social and environmental impact assessment. Consultation processes should be designed to ensure that citizenry are informed about relevant issues, are given an opportunity to comment on them, and are able to find out how their comments were considered. A public hearing is a formally advertised and convened meeting to afford any person, who deems their interest to be affected by a proposal, an opportunity to be heard. Such hearings normally involve presentations followed by public discussion. Hearings are consultative in nature, they afford citizens affected by a decision an opportunity to have their views heard before decisions are made, but they do not normally bind a utility to take the consumers' views into account. In order that those concerned can determine whether their comments have been considered and acted upon, some jurisdictions require a record of decision. This requires an agency to state its final decision, identify all considered alternatives, specify the best alternative, identify all factors that it used to make its decision (including comments received), and state how those factors affected the decision.

7. MEMBERSHIP ON ADVISORY BODIES

Advisory bodies are composed of a representative sample of target groups who are regularly consulted and provide guidance and advice to managers. Advisory boards can be solely composed of consumers or can bring diverse stakeholders together. Advisory bodies can be attached to a utility, a regulator, or a local government. Advisory bodies convene regularly, and can either be time bound or standing bodies. Advisory bodies require a quite extensive time commitment from their members that represent users. As a result, standing bodies have at times been hard to sustain, especially in those cases in which results are limited, often due to unclear mandates and procedures.

8. MEMBERSHIP ON DECISION MAKING BODIES

A corporate oversight board (or 'board of directors') is responsible for monitoring and steering the performance of the service provider. Other decision making bodies in the water services sector include regulatory boards, as well as sectoral policy making commissions at the national or municipal level. If consumers are represented on these bodies, they are normally one of several groups. The effectiveness of consumer membership on boards as an accountability mechanism depends on the power that the decision making body has and the role and mandate of its consumer members.

9. INVOLVEMENT IN THE EXECUTION OF SPECIFIC UTILITIES ACTIVITIES

This tool is often used in poorer communities, by giving domestic users an opportunity to engage in the management of tertiary networks or public water points, maintenance of latrines, as well as contributions to works to extend systems through community labor. Where consumers organize themselves to provide an element of the service, they may provide the service under contract to a community which has its own decision making powers, or under a sub-contract with a utility. User involvement can be a first step to building a relationship between a utility and

its users. For utilities, user involvement in their activities might be less threatening then formal consultative tools. The involvement of users in activities of utilities can either be organized by (a unit within) a utility, or by an NGO. If civil society is organized sufficiently, this tool is hence also applicable to pre-functional utilities with little internal organizational capacity.

10. PARTICIPATORY BUDGETING

Residents decide how to allocate (part of) a public budget. It is mostly applied at the city level and addresses the priorities of municipal budget decisions for different municipal services. Direct popular participation through voting is used at plenary sessions to select priorities for investments and to elect representatives on a council. This council in turn convenes to work out more detailed conclusions on behalf of the citizenry. Water services are often prioritized – it features consistently in the top three priorities in many cities. Participatory budget can determine capital investments to the water services sector from municipal budgets, yet the process does not directly address the management of water services.

11. OWNERSHIP OF UTILITY

Utilities can be fully owned by consumers or co-owned by consumers and governments. A co-owned utility, by its nature, is governed by private company law rather than public law. Utility (co)ownership does normally not mean asset ownership; cooperatives and consumer co-owned utilities nearly always lease assets from the government. Hence, consumer co-ownership is more common in countries with a civil law tradition that prohibit divestiture of WSS assets from the government. A cooperative is an autonomous association of persons united voluntarily to meet their common economic, social, and cultural needs and aspirations through a jointly owned and democratically controlled enterprise. A consumer cooperative is one specific form of a cooperative, in which consumers own a utility. A cooperative's statute normally specifies that any profit has to be reinvested in the service. Consumer cooperatives have greater political independence than a public utility, a higher accountability to customers, while usually the same regulatory accountability as any other service provider.

The authors then go on to identify methods of recourse:

12. UTILITY COMPLAINTS MECHANISMS

13. THIRD PARTY COMPLAINT MECHANISMS

14. LEGAL RECOURSE AND REDRESS

These are a form of consumer responsiveness but not really of consumer involvement, but they are a necessary part of the consumer spectrum.

Many of the above mechanisms are envisaged by the ISO standard IS 24510: *Activities relating to drinking water & wastewater services; Guidelines for the assessment and for the improvement of the service to users*. In addition to the more traditional outreach work and public information and complaints mechanisms, it makes reference to 'standing user committees', 'consultation at key decision points' and 'participation in dispute resolution.' Attempts are being made to launch the standard in Africa to put the above ideas into practice.

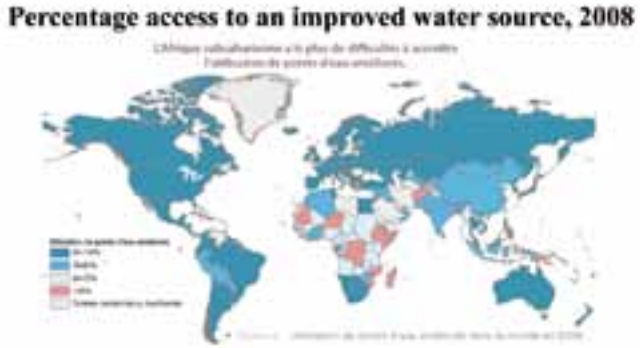
WATER SERVICE GOVERNANCE AND PERFORMANCE: OVERALL VIEW OF A FUNDER

Aymeric Blanc[1]
Maurice Bernard[1]
Cassilde Brenière[1]
& Lionel Goujon[1]

KEY WORDS: development, performance indicator, public-private partnership, capacity building, sectorial framework

The French Developpment Agency (AFD) is the financial institution at the French government for public development aid. Its activities in the drinking water and wastewater sector represent 10% of its total financial commitments every year, or about 712 million Euro in 2011, which were primarily invested in sub-Saharan Africa and in the Mediterranean region.

Investments in water and wastewater treatment have risen sharply since 2005. This financing may take the form of subsidies (€69 million), loans to states (€645 million), or direct loans to public enterprises or to Southern communities (€182 million).



The **right to water** was recognized as a "fundamental right" by the United Nations in 1999. However, despite the mobilization to reach the UN's Millennium Development Goals (MDGs) that had a considerable impact on improving access to water, more than **800 million people** still have no access to "improved" sources of drinking water[2]. Indeed, to decree a right is not enough to make it happen, and appeals to make water a free commodity have not brought sustainable relief. That is the challenge posed by water access, as it is simultaneously an essential public and economic asset. There are costs to supplying drinking water, and the implementation of the right to water requires a socio-techno-economic organization of the water sector.

While the Millennium Development Goals in terms of access to improved water are likely to be attained, this objective masks significant disparities: **on a local level, many countries, primarily African, will not meet these goals**. Furthermore, the notion of access to an "improved" water source does not take into account all the dimensions of the problem, most notably the cost of this access, its continuity, or service quality.

As regards sanitation, which includes not only autonomous or collective installations for the evacuation of waste, but also the entire collection and wastewater treatment sector in its broadest sense, the situation is even less satisfactory. The task ahead is enormous: while 87% of all humans have access to what is considered satisfactory drinking water, **only 61% have access to "improved" sanitation facilities**[2]. Thus, despite considerable efforts on the part of the international community and donors, a glaring lack of infrastructure, complicated by demographic growth and migratory flows to the urban centers has failed to stem the decline in sanitation access rates. **The Millennium Goals in terms of sanitation will likely not be met in 2015**.

The AFD is accountable to the Government, and in a broader sense to the French people. Indeed, the latter provide, either directly or indirectly, the funds for the subsidies and loans that are granted. For this reason, special emphasis is placed on **the accountability on results and sustainability of projects**: AFD financed projects in water and sanitation expected to provide an

1_ AFD
2_ Joint Monitoring Programme (JMP) 2010 ; WHO /UNICEF

additional 800,000 people with drinking water and an additional 500,000 people with access to sanitation facilities. These objectives were reached in 2011.

Despite these positive results, public development aid in areas of water and sanitation falls short of the actual needs in infrastructure financing. This is one of the reasons the AFD considers that the definition and implementation of a clear and effective sector framework (see box 1) to be decisive in terms of access to water and sanitation. The idea of a sectoral framework is to allow for the mobilization of national and international financing over and above current projects.

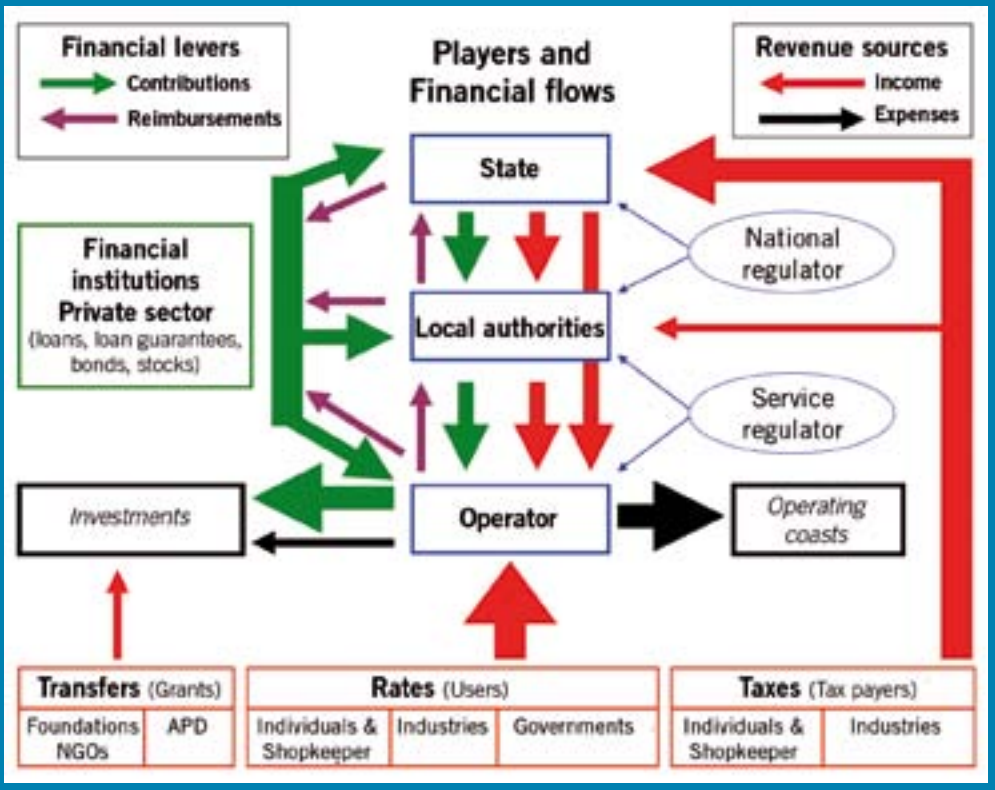
1. DEFINING AN EFFECTIVE AND REALISTIC SECTORAL-SPECIFIC FRAMEWORK

The framework requires:

- an operational legislative and regulatory environment
- a clear division of the responsibilities and resources of each organization
- a realistic development strategy, particularly with regard to financing which must rely on optimized costs and reliable, predictable financial resources

The diagram below illustrates the various players in the sectoral framework as well as the financial flows that links them one to another. This diagram underscores the growing importance of the territorial communities; in many countries, they have become players in their own right due to the process of decentralization of the management of water and sanitation services.

Diagram formalized by the OECD in a study conducted by the AFD



It should be noted that in a sectoral framework, a clear definition of the responsibilities and financial flows are particularly important. However, the AFD is not in favor of one organizational or management model over another:

- Regulatory duties must be executed to ensure full respect of the rights and obligations of all parties concerned, but the creation of a regulatory authority is not obligatory as a number of other forms of regulation are available (notably via contract).
- Local authorities may get involved by ensuring that water services are responsive to the needs of users, and by appointing a trusted representative – but **a number of levels of decentralization are possible**. It is up to central authorities to supervise this process by granting sufficient rate flexibility to the territorial communities.
- The operator may be public or private (with varying levels of public service delegation), but, in any case, the operator must be held accountable for its technical and commercial performance.

Support in defining and implementing these clear and effective sector-specific frameworks is consequently one of AFD's priorities in water and sanitation.

In addition to financing water and sanitation infrastructures, the projects financed by AFD always include capacity-building efforts as well as a public health and hygiene awareness campaigns.

Capacity building, considered by AFD as a completely separate intervention, is a long term commitment that must be carried out on three interdependent levels:

- individual (knowledge and competence)
- organizational (performance, ability to attain targets)
- institutional (sectoral governance: institutions, regulation, standards, monitoring-evaluation, etc.)

Of course, improved individual expertise can only be fully exploited within organizations capable of taking full advantage of the expertise. Similarly, the accomplishments of an effective entity will only be meaningful in a sectoral setting with clear and relevant goals.

The means deployed for capacity building usually used by donnors include:

- technical assistance (either in-house or as-needed) provided by the engineering consultants;
- training and exchange programs (training centers, managerial training, mobilization of expertise, international meetings, etc.);
- execution of studies and comparative and forward-looking analyses focused on one or more countries and shared with partners in the South;
- performance-based support of public policies in southern countries (assistance programs aligned with the priorities of our partners in the south, budget assistance backed by reform and performance objectives).

In addition to these conventional means, **sectoral dialog between AFD and its southern partners is a pertinent capacity-building tool** when it emphasizes monitoring project results and operator performance (see box 2).

AFD also intends to promote the means for more integrated capacity building within the sector with the support of French stakeholders, notably through **partnerships with French operators and operators in the South** (see article p. 128). Experience has shown that these partnerships are often more a source of inspiration for change for the partners in the South than one of conventional technical assistance: the same advice will be better accepted from a peer than it would from an expert.

2. THE SECTORAL DIALOG ON PERFORMANCE INDICATORS AS A TOOL FOR CAPACITY BUILDING

In addition to the indicators monitored in conjunction with the Millennium Goals (rates of access to water services), performance indicators can be monitored to evaluate technical performance (service continuity, compliance of water distributed or wastewater treatment, network output, etc.), commercial performance (percentage of installed water meters, billing rates, accounts receivable recovery rates), and organizational performance (number of agents per user, etc.) of the operators. All are open to criticism yet indispensible.

In all the projects that the AFD finances, it requests that southern countries submit periodic reports to better monitor the progress of construction projects as well as changes in the performance of the operators. These indicators must be limited in number and rely on data that are easily collected, and the method used to calculate them must remain unchanged. **It is not the indicator's value that is of interest, but how it changes over time**.

Experience has shown that these indicators themselves are not enough: they should form the basis for a dialog between donnor and its southern partners. Information provided by the indicators should be supplemented by on-site evaluations. The regular monitoring of performance indicators by a strong local institution or a funder is a good means of ensuring performance improvements. **Operators or institutions that know they are being monitored will seek to improve their organization and ask for the help and support they require**.

In cross analysis studies, a comparison of the differences in performance can be conducted between countries or operators. These comparisons are only relevant for operators that have identical constraints – hence a similar sectoral framework.

The comparison of performance indicators of different operators within the same country has often been a source of healthy competition (Morocco, Colombia, etc.). Comparisons of very diverse situations must be accompanied by a complementary qualitative analysis and be conducted for the purposes of exchange or diagnostic purposes rather than for evaluation purposes.

Furthermore, the AFD considers that Public/Private Partnerships (PPPs) implemented in developing countries in the last few decades, even if the financing targets initially set in the sector were not often met, have in fact been effective in clarifying the roles and enhancing local capacity building. These positive effects have generally been perpetuated after the departure of the private operators (see box 3).

3. THE PPPS AS TOOLS FOR CAPACITY-BUILDING

The inefficiency of certain public enterprises in Developing Countries (DCs) and the failure of reforms in the 1980s that attempted to introduce a consumer culture in these countries prompted proponents of development to promote the introduction of the private sector in the 1990s. The support of a private operator, by virtue of its management experience, technical expertise, and financing capacities, was seen as a means of putting public finances in order and meeting public service goals (most notably public access to water services networks). These expectations, however, were found to be unrealistic and the first generation of PPPs in DCs were not able to survive the financial or political crises. A second generation of contracts was signed a decade later and this time, the private sector assumed a limited share of the risk and effective regulatory tools were put into place to enable the State to assume its responsibilities (pricing, network access policies for poor populations, etc.). Several management contracts or tenancy arrangements were signed (if the problem of financing investments had not been settled), which contributed proven expertise that helped improve the technical and financial performance of the operators (output, increase in billing and recovery rates, personnel productivity, etc.) and balance operator accounts.

For example, the 5-year management contract signed between Suez and the Johannesburg Management Company (Jowam) aimed at recovering technical and financial integrity despite high water losses (loss rates in Soweto were 65% in 2001), and a culture of the non-payment of bills (the recovery rate in Soweto was 10% in 2001). The contract included a training program (part of which was based on operator remuneration) in order to promote a corporate culture oriented toward service and efficiency. It resulted in a transfer of expertise to Jowan that has today made it possible for it to fulfill its mission autonomously.

A recent study[3] analyzed the performance of over 65 PPP contracts in the DC water sector and it pointed out that the rate of access of households to water networks increased considerably when a PPP was successfully implemented. Capacity building has spread to other companies that hadn't entered into a PPP by virtue of the imposition of sectoral discipline by country officials (through the definition of a sectoral strategy, definition of goals, planning of sector financing, etc.). The State and the municipalities, henceforth relieved of their operational duties, were able to learn about the new role of regulator. Finally, those public water services that remained unchanged benefited from the competition brought about by their comparison to PPPs operating in neighboring territories.
They consequently had to learn how to adjust and adapt their own management methods (Morocco, Brazil).

3_ MARIN, Ph., 2009, Public-Private Partnerships for Urban Water Utilities: A Review of Experience in Developing Countries, World Bank / PPIAF, Trends and Policy Options, n°8.

ISO STANDARDIZATION: IMPLEMENTATION

Natalia Drault[1]

KEY WORDS: standardization, users management, service, assessment

Three key standards give guidelines for managing water utilities and assessing water services (processes, activities, means and resources necessary for abstracting, treating, distributing or supplying drinking water and for collecting, treating and disposing wastewater as well as for providing the associated services and evaluating the service being delivered). Developed by the ISO technical committee ISO/TC 224, *Service activities relating to drinking water supply systems and wastewater systems – Quality criteria of the service and performance indicators*, the standards are:

- ISO 24510:2007, *Activities relating to drinking water and wastewater services – Guidelines for the assessment and for the improvement of the service to users;*
- ISO 24511:2007, *Activities relating to drinking water and wastewater services – Guidelines for the management of wastewater utilities and for the assessment of wastewater services;*
- ISO 24512:2007, *Activities relating to drinking water and wastewater services – Guidelines for the management of drinking water utilities and for the assessment of drinking water services.*

ISO 24510 Implementation Process used by Aguas de Santiago S.A.

Aguas de Santiago S.A., a water and wastewater utility serving some 500,000 inhabitants of the Argentinean province of Santiago, decided to implement the standard ISO 24510:2007 which provides guidelines for the assessment and improvement of drinking water and wastewater services to users. Aguas de Santiago found standard ISO 24510 to be an excellent management tool, with high flexibility and widely useful in improving services to users.

"Its flexibility, specificity and user-orientated approach makes standard ISO 24510 the right tool for any public or private utility," said Sebastián Paz Zavalía, General Manager.

At the end of 2007, Aguas de Santiago decided to start a new project: to implement standard ISO 24510 in line with their user-oriented policy.

1ST STEP: BUILDING UP A TEAM

As a first step Aguas de Santiago organized a multidisciplinary team comprising:

- staff from technical departments;
- staff from the administrative departments;
- managers from all the areas;
- the General Manager.

The active participation of the General Manager and of the area Managers shows the commitment and support of the highest level of the organization in this project.
In order to reach a consensus for the implementation of standard ISO 24510, a **project coordinator was assigned** so as to convene and facilitate the multidisciplinary team meetings and to elaborate specific documents.

2ND STEP: MEETING ISO 24510

An intensive training course on standards ISO 24500 and ISO 9000 was organized for the multidisciplinary team. IRAM, the Argentine Standardization Organization, as Head and Secretariate of the ISO/TC 224/WG 5 promoted the use of the standard and developed in-company courses so as to gather examples of implementation. The training sector of the IRAM was in charge of developing this in company course.
The inclusion of standards ISO 9000 in the training course was meant for a possible future implementation of ISO 9001 requirements in the service and in the user process.

3RD STEP: DESCRIBING AGUAS DE SANTIAGO S.A. SERVICE TO USER ELEMENTS

Considering the ISO 24510 methodology, the project coordinator divided the multidisciplinary group into 5 working groups (each with a working group coordinator) and assigned one "service to user" element for each of them to describe. Each group included their staff in charge when describing the assigned element (Figure 2).

1_ Dirección de Normalización IRAM

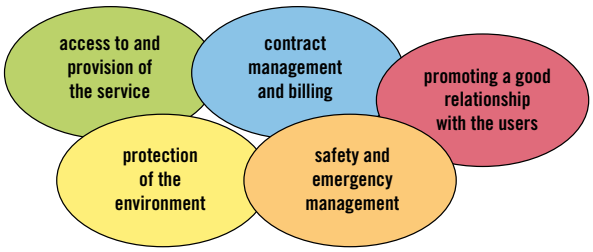


Figure 2 - ISO 24510 - Essential elements of service to users

After describing the 5 essential elements of the service to user and after a consensus was reached within the multidisciplinary team, Aguas de Santiago knew what their qualitative initial situation was concerning service to users.

4TH STEP: DEFINING OBJECTIVES

According to the ISO 24510 methodology, the next step consists of identifying the users' needs and expectations. ISO 24510 considers that the quality of the service provided to the users depends on the ability of the water service utilities to meet the users' needs and expectations that are considered as objectives for the utility.

ISO 24510 shows key needs and expectations of users that should be considered when defining objectives. Objectives are linked to service to user elements (Figure 3).

Aguas de Santiago S.A. considered that the key objectives stipulated in the standard ISO 24510 and that were the result of an international consensus including an active participation of *Consumers International* were the best option and they analyzed each of them. In some cases Aguas de Santiago decided that some objectives were not applicable according to local conditions and they provided the rationales to justify this. For example, the objectives linked with wastewater treatment were not applicable because the construction and operation of wastewater treatment plants does not fall within the concession of Aguas de Santiago service. First the waste water treatment plant had to be built and then Aguas de Santiago would be in charge of their operation and management.

On the other hand they have also analyzed the possibility of including additional objectives in the future.

Aguas de Santiago also decided to define for each objective, different goals that would partially support the corresponding objective.

5TH STEP: WORKING TOWARDS USERS NEEDS AND EXPECTATIONS

Once the objectives and goals were defined, and in order to satisfy users' needs and expectations Aguas de Santiago defined for each goal different actions to be followed.

ISO 24510 provides guidelines to define these actions.

Each action was characterized by a working period, a sector or a person in charge and the resources needed for its implementation. As an example, for Repairs, Aguas de Santiago has defined two actions:

The first one is to develop and implement a programme to lit, maintain and mark the valves for which a 5 year working plan was defined by the Planning and the Water departments.

Another action was to organize special intervention teams that intervene before the operators of the Water department arrive, on the basis of a one-year contract.

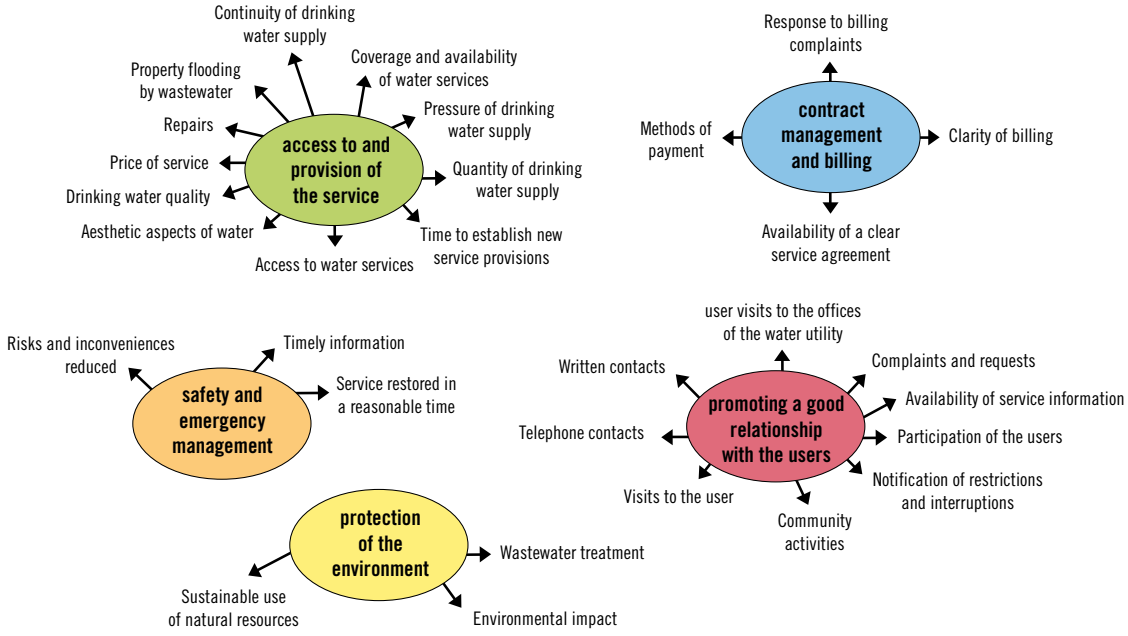


Figure 3 - ISO 24510 - Key issues related to users needs and expectations

6TH STEP: ASSESSING SERVICE TO USERS

This last step is the assessment of the success of goals and objectives; Aguas de Santiago decided to use performance indicators for their service-to-user performance, as stipulated by standard ISO 24510. Each indicator is directly linked with a specific action. The overall idea is for Aguas de Santiago to observe how the trends of these performance indicators reflect the effort they will be making on improving their service to user.
For the last step a template has been developed. See example below:

Once the templates were completed for each objective, a GANTT diagram was developed with the actions and periods predefined for them.
After 4 years of working with standard ISO 24510, Aguas de Santiago has elaborated a report based on the information gathered during the application of standard ISO 24510 and they are now undergoing a 3rd party verification process.

Element: Promoting a good relationship with the users		
Objective: Telephone contacts: Where telephone service is available, the user expects telephone calls to be responded to and deal with in a reasonable amount of time, either directly or by being transferred to the appropriate service department. the user expects to be able to notify the water utility at any time during an emergency related to the service.		
Target 1: Reduce the amount of incoming telephone calls with no response	**Action 1AI:** Complete the implementation of a Call Center	**Assessment criteria:** effectiveness in handing telephone contacts
	Working period: 6 months	**Indicator:** % de contactos telefonicos entrantes atendidos
	Responsible: Technology department and Human Resources	**Definition:** percentage of the total number of telephone contacts fromusers that were answered
	Resources: Tecnological-Telephone central, call center, telephone digital lines. Human-personnel from user service area, CeAC y UGT, IT Department	**Processing rule:** [telephone contacts from users in a calendar period that were answered (number)/user telephone contacts made in the calendar period (number)] x 100%
	Action 1An:	**Comments:**
	Working period:	
	Responsible:	**Collecting data**: informatic tariff system from the telephone central and data from the call center data base and from the telephone operator
	Resources:	**Analysting and converting data:** IT Department, DW
	Action 1BI: Develop a telephone contact attention procedure	**Assessment criteria:** Existence of a procedure for answering telephone contacts
	Working period: 1 month	**Indicator:** Existence of the procedure (yes/No)
	Responsible: O&M department	**Definition:**
	Resources: Humano-personnel from communication and commercial departments	**Processing rule:**
	Action 1Bn:	**Comments:**
	Working period:	
	Responsible:	**Collecting data:**
	Resources:	**Analysting and converting data:**

Some conclusions

As a first conclusion, it is important to put the emphasis on the main tools provided by those standards, which make it possible to improve the governance of water & wastewater services. Then the objectives must be set and the performance indicators must be defined.

Water services have significant social and political impacts. In Argentina, for many years, many types of management methods have been used alternatively (public, private, municipal, mixed models), sometimes over short periods with some adverse consequences at the organizational level.

The reason for these changes is the continuous search for a sustainable management model that considers not only the expansion of the services to scattered rural areas but also the satisfaction of users promoting social justice within the country.

The new standard ISO 24510 that Aguas de Santiago has successfully implemented gives guidelines that help improving the relationship with users understanding their needs and minimizing the differences between their expectations and the strategic guidelines of the operator.

Nowadays in Argentina, water operators use the model Regulation-Service targets-Regulator, which is the baseline for the service provided. The problem is the lack of operator-user-regulator dialogue. This makes it impossible to consider the specific need of users.

The management guidelines and model within standard ISO 24510 consider this vision taking as a first step the regulatory baseline, and facilitating the definition of the objectives based on users needs and expectations.

This ISO 24510 model needs the commitment of all the organization, mainly the top management. In the experience of Aguas de Santiago, in a short term, results are perceived mainly as a lower number of users' claims and in the increase of users paying for the service.

The process of implementing this model also gives immediate results at organizational level including the multidisciplinary team work, a revision of all the technical, commercial and administrative procedures starting a path of continual improvement.

The complete Report is available at the following address:
www.aguasdesantiago.com.ar/paginas/ver/21/iso_24_500

TRANSPARENCY AND CONTROL OF PUBLIC MANAGEMENT: THE EXPERIENCE OF THE PARIS MUNICIPAL WATER BOARD

{ Mathieu Souquière[1]

KEY WORDS: contract of objectives, performance monitoring, direct management, drinking water, Paris

Following the municipal elections in the spring of 2008, the city of Paris decided to create a new public water utility to offer better quality water at a better price to Parisians. This reorganisation put an end to twenty five years of a complex and opaque system that did not allow the authorities to have complete control over this service and to guarantee its full effectiveness.

In 1984, the city made the choice to delegate the production and distribution of water via contracts awarded to three separate operators: the first was awarded to a semi-public company created to this end called the SAGEP (Société Anonyme de Gestion des Eaux de Paris), the second was awarded to the Compagnie des Eaux de Paris (a subsidiary of the Veolia group) for the right bank and the third was awarded to Eau et Force Parisienne des Eaux (a subsidiary of the Suez Group) for the left bank. As these delegation contracts were reaching their term in 2009-2010, the city decided to carry out studies and hold debates as of 2007 to select the most appropriate management mode. The city's political and pragmatic decision was to select a single public operator.

From a political standpoint, this choice was based on the strong conviction that water management must comply with public interest: water is a common good, a resource that must be controlled and preserved through stewardship and responsible management. By creating a single public operator, the city of Paris gave itself the means to control the entire value chain to guarantee improved control over water management and water quality, by integrating long-term environmental and asset issues that are sometimes quite incompatible with short-term financial reasoning. The new public water utility also makes it possible to meet the social and democracy-driven demands that structure the actual principle of municipal action in Paris through the setting up of an adapted social mechanism and through greater citizen involvement in the decisions that concern them.

For several years, different public reports highlighted certain deficiencies of delegated management. A report published by the Court of Auditors in 2003 revealed the same trends for water and sanitation services managed by private companies: a loss of technical control over the service by the municipalities, a weakening control of the organizing authority over the activities of its delegatee, as well as the creation of position advantages for the operators. These types of criticism are nonetheless insufficient to conduct the trial and rule, in this light, that public management is better than delegated management. This can only be proven if the questions of performance, transparency and control of the proper execution of the service are also taken into account by the public operators and their organizing authorities.

Paris has tried to find a novel and ambitious solution by assigning an "objectives contract" to its newly created water board. This contract is not to be confused with a management contract that can exist between organizing authorities and public service delegatees for a simple reason: an autonomous water board and a private operator cannot be considered in an identical way by the local authorities. The first is an administrative entity that is virtually consubstantial; to illustrate, the elected officials of the said local authority sit on its Board of Directors, and moreover staff from the competent administrative departments attend the board meetings. In Paris, monitoring and transparency are also guaranteed by the presence on the Board of Directors of representatives of environmental associations, users, civil society and the Paris Water Observatory, a dedicated municipal body of participatory democracy. The water board is therefore, due to its structure, "under the democratic control" of the local authorities and the users. This, in and of itself, creates a first fundamental difference with the notion of public service delegation, which makes the clear distinction between the delegator and the delegatee.

1_ Head of Strategy, institutional relations and communications at Eau de Paris

In accordance with the by-laws that were approved by the Council of Paris in November 2008, the EAU DE PARIS water board has been managing the whole system since the 1st of January 2010, and is directly in charge of the following missions:

- long-term protection of the available surface and underground bodies of water, their conservation and their restoration;
- production and transport of water;
- distribution of water;
- informing and management of water services users;
- supervision and preservation of the quality of distributed water;
- expertise and research concerning water;
- security of the water supply and continued servicing of priority needs;
- production, transport and distribution of non-potable water and, notably, in association with the concerned services and users, support to manage and reuse rainwater.

The policies of the local public water board, its activities and the investments falling within its remit, are therefore managed by the city of Paris and detailed in the previously mentioned objectives contract, which was presented for approval to the Council of Paris on the 23rd and 24th of November 2009, and adopted for the period 2010-2014. This contract is the cornerstone of the service, through clearly defined and democratically debated governance, sharing of responsibilities with the local authorities and guidelines for the water board's actions. This singular document was moreover the subject of extensive consultation in its drafting, in particular with the representatives of the Paris Water Observatory.

This document reasserts the role of the city of Paris, the organizing authority for the service, through its direct presence in four major fields:

- representation to the administrative authorities and regional authorities;
- communication strategy towards users and subscribers;
- management of crisis situations;
- international relations and solidarity for the access to water and sanitation.

Beyond this role clarification, the contract sets ten main objectives for the water board to guide its actions, guarantee its efficiency and enable the transparent supervision of its operations. These ten objectives of a social, environmental, economic and technical nature are:

- Guarantee the supply of good quality water in all circumstances;
- Place the user at the heart of water services;
- Ensure rigorous and transparent management;
- Guarantee access to water;
- Ensure the performance of the network and installations;
- Maintain a high level of maintenance and enhancement of the infrastructures;
- Develop a forward-looking vision for the water supply system;
- Propose a socially-advanced company model;
- Implement an environmentally responsible and certified management system;
- Support evolutions in non-potable water services.

These main objectives are all associated with an array of business and performance indicators (over 130 in total), verified on a monthly or quarterly basis. Based on the main regulatory indicators (notably those defined by the ONEMA – the National Office for water and aquatic environments) and enriched with factors specific to the Parisian utility, they make it possible to have figure- and objective-based monitoring of the board's main actions. Each year, the water board must generate an activity report based on the aggregation of all of these indicators to be presented to its Board of Directors and to the Council of Paris to report on the correct execution of the said contract. The indicators are examined closely to allow the local authority – its elected officials and technical departments – to observe the operation of the board, to carry out an on-going evaluation and to make adjustments to management elements if necessary. Although this contract should not be considered as a "management contract" similar to those agreed by an organizing authority and its service delegatee, it is still a very demanding agreement for the operator and its supervisory body, since both are fully bound by the agreement. The water board also produces an information document intended for the service users and as a possible means to compare with other water utilities, to be as transparent as possible and to allow the necessary benchmarking.

This contract represents the foundation of the ambition of the city of Paris: through the EAU DE PARIS water board, to create a modern public management model that is innovative, transparent and efficient.

The Governance and Performance of Delegated Public Water and Sanitation Services

Interview with Olivier Brousse, President of the FP2E

What is your opinion of the overall performance of public water and sanitation services in France?

The model that has made France an example in terms of water management for many countries in the world (both developing and industrialized countries) is one that stresses long-term cooperation between the private sector and a strong public sector. In other words, public authorities, who own the infrastructure, make decisions regarding the strategy and deployment of public services, whereas specialized companies, under the control of public officials, manage and operate these services while assuming all or part of the risks.

This balanced collaboration between the public and private sectors is one of the key factors that promote the continuous strengthening of the public service sector, but it is not the only factor. Other essential factors include: organization by drainage basin, all costs are recovered through billing, services are managed by local authorities to be more attentive to users, and most important, local authorities have a free hand in choosing their management approach.

The results bear this out: there are no longer epidemics linked to unclean water or deficient water treatment in France. Life expectancy in France increased considerably in the 20th century thanks in large part to the significant progress made during this period by the water and wastewater sectors – a fact often overlooked by the French.

Today, the quality of drinking water is remarkable and available 24/7 (which is not the case in some neighboring European countries). Almost the entire population has access to water and sewage networks (except in rare cases). The networks and infrastructures are in good operating condition, and significant advances have been made in wastewater treatment. All this is provided at a variable but affordable price.

These positive results can be measured and precisely expressed in figures: water companies made an early commitment to measure service performance through the adoption of standardized referential indicators, of which certain were adopted by public officials and applied to all services, regardless of their managerial style or approach. The objective of this improvement process, overseen today by the French State through the *Office National de l'Eau et d'Assainissement*, is to promote the transparency of water and wastewater services for the general public, while giving local officials reliable tools to assess and improve the performance of these services and bringing clarity to water rates and to the quality of service rendered to the citizens.

I think that France has a good record in terms of the performance of its public water services, even if they are not perfect. A number of polls and indicators show that a large majority of the French is satisfied.

Isn't the French model currently facing a crisis?

New challenges have emerged in recent years as the limits of the conventional economic model in meeting the financing needs of these services have become apparent. The question of their size has also been raised and the social dimension has become paramount. We are also facing an unprecedented economic crisis that has adversely affected both household purchasing power and the finances of local municipalities. It is for these reasons that elected officials in France are taking a more careful look at their water and wastewater services, and they have begun to react to the concerns of their fellow citizens as tensions have risen over water policy issues.

However, I don't think that the French water model is in crisis – on the contrary, because it is not monolithic. I think that it should keep its foundation and organizational principles intact. Its components are not static – they evolve with the times and adapt to situations.

Indeed, the management of services on the local level is still relevant (water is a local resource), even though the municipalities evolve and intercommunal cooperation increases.

The principle of cost recovery of the small water cycle through billing is also still relevant. But questions regarding the financing of the large water cycle are being raised, and the role of the water boards is now more relevant than ever.
In this fast-moving context, the needs of communities are evolving toward increased modularity and flexibility, both in terms of governance and economic model.

As for the water companies, they have always shown their ability to adapt to the times. Over the years, they have shown their capacity to discover new technologies to meet new challenges. They have invested, innovated, proposed, and reacted to crises. Today, they are devoting significant ongoing efforts to modernize and raise productivity, which makes it possible to pass on significant price reductions when submitting bids or engaging in renegotiations. They share the requests of elected officials and users, and offer new solutions that permit a rebalancing in the relations and means of cooperation between stakeholders. The contracts signed between the communities and the water companies are very diverse and multiform to better meet the communities' needs, which is what we all strive to do.

Let there be no mistake, the communities and the water companies are united in a common goal: the improvement of public water and sanitation services. In other words, they aim to offer the best service at a fair price for all their fellow citizens. Of course, much remains to be done, but the industry is determined to adopt an exemplary behavior.

Could you explain the link you made between performance, governance, and competition?

In my opinion, service performance must necessarily involve the following governance principles:

- The municipality must exercise authority and control and be strong and committed to public service
- Operational functions must be carried out by a specialized company
- A "separation of powers" between those who decide and those who execute is essential – it is the only way to ensure effective oversight

Performance requires control, and control requires clear governance and the separation of roles. This is a winning dynamic of which the prerequisites are the existence of a specific framework (a contract), an adequate period with respect to service and investment issues, and a pertinent perimeter of action that would enable action on all performance indicator levers.

The contracts that we draft with the municipalities (two to three delegations of the public service are signed every day in France) include more and more clauses that index the compensation of the water companies based on targets that have been set according to a bonus-malus performance scheme. Oversight by the contracting authority is thus essential, and the separation of powers ensures transparency and effectiveness. Indeed, how can a municipality that operates its own water services impose punitive sanctions on itself?

Finally, in France, competitive dynamics are very high. Between 800 and 1000 calls for tender every year are for water and wastewater public services. The rivalry between companies in the competitive bid process promotes innovations and encourages participation in public water services. To put it succinctly, there is nothing like competition when a contract comes up for renewal to spur innovation, improvements and cost reductions.

Competition also offers an opportunity for financial margin maneuvering, either by lowering the price of water or by promoting greater investment in the service. It provides "economic breathing room," something that is also encountered during the periodic renegotiation of contracts, which also provides feedback to the municipality on the operator's performance and a commitment on future performance. This notion is fundamental as the operators are compensated for gradual improvements in service performance and not on the varying water rates. This approach is a sure guarantee of added value and good performance in public water services.

In conclusion, I think that governance, competition and performance are intimately linked, and that they are the foundation of renewed collaboration between local municipalities, specialized water companies, and the users of this public service.

REGULATORY MODELS **FOR WATER AND SANITATION SERVICES**

Guillem Canneva[1]

KEY WORDS: self-regulation, contract, agency, service provider's remuneration, institutional framework

Water and sanitation are essential services and as such, they are often subject to economic, environmental and health regulations. Yet the way in which such regulations are organised from one country to the next varies considerably. The objective of this paper is to present a summary of the main regulatory models.

Reasons for regulating water services

Water and sanitation services are distinct from other services in a number of ways, first and foremost because they are essential and require costly infrastructure. Domestic water has multiple uses – drinking, cooking and hygiene being the most immediate – that make it indispensable, but it can also be used to water food crops in connected areas, or as a vector to flush waste. As a result, domestic water is a factor with externalities: as well as its direct impact on each user, it also has an impact on others. Access to quality water and to sanitation has very positive consequences on public health by reducing the risk of water-borne epidemics, just as sanitation has an obvious impact on the environment in general and on water resources in particular. Thus, access to water and sanitation supports economic development in urban areas. Water and sanitation services rely on networks of pipes that form a costly infrastructure with a long lifespan. Once installed, it is difficult to reallocate these networks to other uses, and since they are mostly underground, they can be difficult to locate and monitor. These characteristics make it a sector that is at once familiar, because it is inseparable from our daily lives, but also unique.

Given the cost of the infrastructure and its maintenance, the cheapest solution is to build one single network to supply these services. This is what economists call a "natural monopoly". In this situation, there is only one operator with no pressure from competition, and because the service is essential, the users are captive, giving the operator a great deal of power and the ability to demand high monopoly rents. This economic characteristic, combined with the health, environmental and social impacts, fully justifies public authority intervention to regulate the sector. However, the operator is running infrastructure that cannot be reallocated, and when the service is widespread, the users are also citizens. To content the population, public authorities may be tempted to impose unsustainable economic conditions on the operator, causing service to deteriorate. In this context, where public authorities, users and the operator are interdependent, regulation can be described as the definition and application of rules determining the service's general framework (definition, technical characteristics, conditions in which the service is provided), the stakeholders' roles and missions, and how they interact among each other. Regulations also specify how the cost of the service is financed.

The different types of regulation

While regulation always pursues the same objective, there are several regulatory models around the world linked to different legal traditions.

SELF-REGULATION

In the self-regulation model, the operator sets its own conditions for supplying the service. It sets prices and determines quality of service. In certain cases, some service conditions such as water quality for example, are defined at national or federal level. Self-regulation can be national in scale (when one national company is responsible for the service) or decentralised at local level. This type of regulation is found in the water boards in France, where the operator is part of the public authority.

1_ AgroParisTech, joint research unit G-Eau, Montpellier (France)

Some authors differentiate direct self-regulation from self-regulation via benchmarking (Trémolet & Binder, 2010). In the latter case, operators voluntarily compare their performance, creating emulation among peers. To do so, the operators often form a joint professional body responsible for the benchmarking. This is the case in Denmark for example, where DANVA, a professional non-profit organisation, analyses and compares the performance of municipal water and/or sanitation companies (DANVA, 2010).

There are some successful examples of self-regulation, which works when those in charge have the public interest at heart and can reconcile the need for efficiency, fair pricing and keeping the organisation financially viable. However, in the absence of any separation of power, conflicts of interest can arise. To win popularity, the company may be forced to adopt unsustainable economic conditions causing service quality to decline, or, on the contrary, may divert part of the monopoly rent for its own benefit or that of the public authority.

CONTRACTUAL REGULATION

In this regulatory model, the delegating authority engages the operator to manage the service via a contract that specifies each parties' rights and obligations. The scope of the operator's role may include all infrastructure investments (this is called a concession) or be restricted to operations, with the delegating authority remaining responsible for major investments (this is known as a lease or affermage agreement). Depending on their type, the term of these agreements varies from between ten and fifty years. Such long-term agreements are necessarily incomplete, since they cannot foresee all future situations, and they therefore contain mechanisms for adjusting them if the context changes. Generally speaking, the regulatory framework specifies which authority is responsible for settling conflicts if the delegating authority and the operator are unable to agree.

This type of regulation is widespread in France with the concept of public service delegation, but also in other countries that have adopted similar legal systems (Spain, Italy, certain West African and Latin American countries). This model introduces competition at the time of awarding the contract, with a call for tenders where potential operators bid for the contract, allowing the delegating authority to hopefully obtain the best conditions (see A. Savignac's paper, p. 52). However, competition is limited to the tender process alone. Any renegotiation, required because these contracts are incomplete, occurs solely between the delegating authority and the existing operator.

REGULATION BY AN AGENCY

Regulation by an agency involves creating one or several independent regulatory bodies responsible for setting conditions for the operators (prices, quality of service etc.) and monitoring compliance. England and Wales adopted this model with the reforms of 1989. OFWAT (Office of Water Services) sets prices for each operator for a 5-year period based on the operators' efficiency, projected investment plans, expected productivity gains and the rate of return on investment. In this case, the operators have licences issued by the government and they own the infrastructure. Environmental or health aspects are regulated by other agencies (the Environment Agency and the Drinking Water Inspectorate in this instance).

The objective of regulation by an agency is to protect the sector from direct government intervention, ensure that regulation is long-term and offer operators guarantees so that they can invest. However, an independent agency may have discretionary powers, something operators mistrust, and be perceived as a kind of dismantling of executive power.

SUNSHINE REGULATION

With sunshine regulation, an organisation is entrusted with collecting information on the performance of water and sanitation services and making it available to all the sector's stakeholders. Disseminating this data reduces information asymmetry between operators (who are well aware of their own costs and potential performance), regulatory authorities and users. This regulatory model is used in addition to other forms or regulation, self-regulation or contractual regulation. It is different from self-regulation via benchmarking because operators are obliged to participate. Among others, France adopted this model when it set up ONEMA (see G. Canneva et al., p. 60), as did the Netherlands when it instated mandatory participation in benchmarking performed by the association of drinking water operators (VEWIN).

PARTICIPATORY REGULATION

In the models described above, users of the service are not directly involved in regulation and are represented by the public authority, delegating authority or an independent agency. There are however some regulatory models where users play a key role, but these models are less clearly defined and there are diverse modes of intervention (see R. Simpson, p. 34). In some cases, the users directly own the organisation responsible for the service, thereby participating directly in decision-making as shareholders. This systems covers 40% of the Danish population for example.

HYBRID MODELS

Having identified different regulatory models, the fact is that a country's water and sanitation sector is often regulated by several models. The sunshine regulation model presented above is used in addition to existing regulatory models. Furthermore, some countries have combined contractual regulations, signed by the

operator and the public authority (government, municipality or an intermediate level), with the creation of an independent agency responsible for monitoring performance of the contract and any changes to its clauses. In this event, the initial agreement is as complete as possible and the regulation agency adjusts it as it is performed, but within a limited framework. Such hybrid models can use the advantages of one model to offset the disadvantages of another. However in some cases, the use of hybrid models can be risky depending on how responsibility is split between the delegating authority and the regulation agency (Trémolet & Binder, 2010).

Regulation of the operator's remuneration

Regulatory models mainly distribute the roles among stakeholders – operator, public authority, users and in some cases the regulation or data collection agency - but they do not necessarily entail a specific mechanism for setting the remuneration paid to the operator.

There are two opposing methods for determining prices: cost-of-service or cost-plus regulation and price-cap regulation. Cost-of-service regulation sets remuneration at an amount that allows the operator to cover its expenditure (cost of service) plus in some cases provides a return on capital employed (cost-plus). The remuneration paid to the operator will change according to how its outlay changes. Price-cap regulation involves setting the operator's remuneration for a given period at the start of that period. Part of the operator's remuneration is paid by users and is determined by prices, while the other part is paid by the public authority and comes from taxes. The latter may amount to zero in the case of full cost recovery. Thus, the operator's remuneration and prices are closely linked.

These two forms of remuneration produce different incentives as regards the operator's productivity and quality of service. The cost-plus system creates little incentive for the operator to cut costs because its remuneration is sure to cover them. There is however an incentive to maintain high levels of investment and quality, and even a risk of over-investment. With this type of remuneration, it is essential to monitor the operator's costs because they are directly linked to its remuneration. With the price-cap system, there is a strong incentive for the operator to cut costs because it retains all productivity gains for itself, the risk being that this proves detrimental to quality or investment. In this case, it remains important to monitor the operator's costs so that, at the end of the period, productivity gains can be shared among the stakeholders when setting remuneration for the following period.

Both types of remuneration can be combined so that the operator's remuneration is partially linked to its costs while introducing productivity incentives (see for example SEDIF's paper on its new redefined contract, p. 92).

Conclusion

Regulatory models define the roles of different stakeholders and how they interact, which is very much part of the definition of governance. However, these models must be seen within the national institutional context in which they were devised. For example, in England, all operators are regulated by one agency because of the high concentration of operators (around thirty for the whole country). Such a system would not be appropriate in a context of highly decentralised management, such as in France with its 14000 drinking water services, or Denmark with 2600.

The adoption or reform of a regulatory model is a key issue for many developing countries, but these models cannot simply be tacked on to any local institutional context. Building a regulatory framework inevitably depends on the existing stakeholders and legal system, and must take account of the level of organisation (local, national or intermediate) and possible synergies with other essential utilities.

In a context where the need for investment is significant, defining reliable, transparent rules not only provides guarantees that attract private and institutional donor funding but also fosters trust between the operator, the public authority and the users. Lastly, whatever the model, various tools are available to improve performance, and these are presented in the papers that follow.

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THE ROLE OF THE STATE, THE LOCAL AUTHORITIES, AND PUBLIC AND PRIVATE OPERATORS IN FRANCE

Agnès Savignac[1]

KEY WORDS: regulation, ownership of infrastructure, price, observatory, transparency

The aim of this contribution is to clarify the roles of the different stakeholders in the regulation of water services in France and, to this end, it sets out the context for examples of performance improvement in France.

The responsibilities of the local authorities

There are currently over 30,000 public water distribution and sanitation utilities in France that are organized under the direct responsibility of the municipalities.

In practice, for drinking water, ¾ of the municipalities are grouped together into inter-municipal structures, in view of the location and availability of water resources. 45% of them are grouped together for collective sanitation, making it thus possible to ensure the consistency of services for conurbations.

The choice of the management mode – direct or delegated to a public or private company – is entirely up to the municipalities that are also in charge of controlling and assessing the performance of the water and sanitation services regardless of the management mode. The local authorities may either directly manage the service or assign it to a specialized operator.

In direct management or "water board" configuration, the local authority is responsible for the investments, operations and customer relations. This configuration is most often found in large cities with very structured technical departments or in small rural communities.
In delegated management, the local authorities decide to assign the management of all or part of the public drinking water and/or sanitation services to a specialized company. Different types of contracts are possible including a service concession (the company is in charge of managing the service) and a full concession (the company is in charge of management but also investments, with the infrastructures built going to the community upon termination of the contract).

Regardless of the chosen management mode, the local authorities are always the owners of the facilities and responsible with respect to the users.

Regulation exercised by the State

Since the responsibility for drinking water and sanitation services lies at the local level, the role of the State is to define the tools enabling the local level to guarantee the transparent management of the services.

At the national level, the State defines standards for the protection of the environment, public health and consumers.

At the level of the regions and départements, the State acts as the water police, defining the water withdrawal and discharge authorisations, and verifying compliance with local and national regulations. Over four million analyses are performed each year to guarantee drinking water quality (which must comply with over 50 criteria).

At the level of the watershed, the water agencies ensure solidarity between water users, particularly in the overseas territories and rural communities.

The State also defines general rules for the management of services: responsibilities of the local authorities, competitive bidding by operators, monitoring of service quality, principles of budgetary management, information and transparency for users.

1_ MEDDTL - DEB (French Ministry in charge of Ecology - Water and Biodiversity Department)

To ensure transparency, the following measures were adopted:
The Sapin law of 29 June 1993 established a procedure focusing on the transparency of delegation contract awarding procedures. Each “Sapin” procedure generates more than 4 applications and 2.5 offers on average after examination of the application dossiers.
Municipalities are obliged to publish an annual report on the price and quality of the services (RPQS).
The delegatees must submit an annual report to the delegating authority and this report is presented to the opinion of the municipality. This is also the case for the water board’s activity report, if applicable.
Large local authorities are obliged to set up advisory boards for local public services (CCSPL).

In application of the decisions made by Parliament, the State incites the organizing authorities to set up a dynamic management of their infrastructure assets and their services by encouraging them in particular to fight against water losses in the water mains networks, by setting up a control within the private domain of the State for both water supply infrastructures (springs, wells, rainwater recovery systems) and non-collective sanitation systems.

Finally, the State exercises ex post facto legal control over the decisions made by the local authorities: legality of the public procurement contracts, compliance with technical standards, lawfulness of the budgets, etc.

Service price and performance

Water and sanitation services must take into account local geographic and economic constraints, as well as extremely different water qualities. Thus the price of the service depends on the local situations but also, of course, on the performance and quality of the service.

Given this complexity and in the absence of elements concerning these local constraints and performances, it was difficult to establish a “right price” for the service. A service ensuring a high-level purification of wastewater will of course be more expensive than a service that discharges insufficiently purified wastewater!

For this reason, the Court of Auditors, in its public report of 2003, indicated that an evaluation of the performance and quality of service provided to users was to be set up in conjunction with the local authorities, public and private operators and consumer associations. Thirty-two water and sanitation service (collective or non-collective) performance indicators were identified addressing the three dimensions of sustainable development (environmental, economic and social aspects).

Since 2009, municipalities or inter-municipal authorities are obliged to report on all of these indicators in the public reports called annual report on the price and quality of services (decree and order of 2 May 2007).

In order to allow the stakeholders access to data, the creation of an observatory on public water and sanitation services in France was assigned to the ONEMA (National Office for water and aquatic environments) by the law on water and aquatic environments of 30 December 2006 (See paper in the book concerning the observatory on public water and sanitation services). The observatory has been proposing an on-line access (www.services.eaufrance.fr) since November 2009. In the long term, the accessible public data will enable the local authorities to have elements of comparison, making it possible to develop local progress plans. Users will have easier access to data concerning the organisation of water and sanitation services in their municipalities (organisation, quality/price ratio) and their level of quality compared with similar services.

The observatory’s mission responds to strong demands from society as demonstrated by the many debates on the price of water in recent years. Its goal is clear: to report annually on the characteristics of water and sanitation services via the results drawn from the performance indicators sent up by the utilities.

This is an innovative approach in France and Europe since the observatory participates in the local regulation of services by disseminating data, which was defined after extensive consultation with the stakeholders, and which is collected and analysed by a body that is independent of the utilities.

In order to manage the observatory on water and sanitation services and to inform the CNE (French National Water Committee) of questions concerning the price and performance of water and sanitation services, one of the thematic committees of the CNE, the advisory committee on the price and quality of services, is in charge of issuing an opinion on the regulations concerning the price of water invoiced to users and on the quality of public water and sanitation services. It also provides the CNE with comprehension tools on certain topical subjects such as access to water for the poor.

EMBRUN WATER AUTHORITY – GOVERNANCE ON THE SCALE OF A MEDIUM-SIZED MUNICIPALITY

Enbrun is a city located in the Hautes-Alpes with a year-round population of 6,267 inhabitants. When public service delegation contract came to an end in 2008, the municipal council decided to change the management model and entrust the distribution of drinking water to a public operator.

This decision led to the creation of the Embrun Water Authority, which was incorporated and given financial autonomy. It is administered by an Administrative Council composed of nine members who are appointed by the municipal council. Seven are members of the municipal council, some of whom are members of the majority while others are members of the opposition. The two other administrators are chosen from the municipality's water users. The Administrative Council votes to approve budgets and rates. It submits an annual report to the municipal council on the price and quality of water services.

The Water Authority is headed by a director, who is its authorizing officer and legal representative. Other than the director, the Authority also employs four staff members (two network officers, an administrative officer, and an accountant). Operational duties – which require substantial responsiveness – belong to the director and his team, while steering responsibilities belong to the Administrative Council. Between the two, the president of the Administrative Council acts as a sort of conveyor belt. He is regularly informed of the Authority's activities and intervenes when setting broad strategic directions is required.

This type of organization clarifies the governance and facilitates a relationship of proximity with water users in medium-sized municipalities. This presupposes finding the indispensable technical support within the federative structures to ensure the level of rigorous, quality management and the ability to meet sudden investment needs, should a problem arise, that are beyond the means of a single operator. In France, the General Councils have at times stepped in to provide these support services in the place of the State, or they have fostered the creation of regional syndicates like those in the departments of the Aube or the Seine-Maritime.

1.3 The performance tools: measurement and control tools

IWA WATER SERVICE PERFORMANCE ENHANCEMENT TOOLS

Helena Alegre[1]
& Manoela Salgado[2]

KEY WORDS: performance indicator, assessment, information, benchmark, manual

In order to reach his objectives, the Manager of a water utility must endeavour to achieve high standards of efficiency and efficacy. Efficiency measures the relation between the different resources employed by the water utility Manager. Efficacy measures the relation between the results achieved and the objectives set initially. Performance indicators (PI) – the quantitative measurements of a specific aspect of the performance of the Manager or of his utility – enable efficiency and efficacy to be monitored and assessed in a rather simple and efficient manner. These evaluation tools are used commonly as measuring instruments in numerous industrial sectors worldwide, and in the last decade their use in the water domain has increased significantly. Since these services are being provided within a monopolistic environment, performance measurement constitutes a means that managers use to optimize continuously the quality of the service provided together with the general performance of the entity they manage. Thus, the players of the sector have realized that, through systematic performance assessment, the services are able to improve their performances continuously, with obvious advantages for all parties involved.

In order to assist the operators and managers of water and sanitations utilities and services in the implementation of performance evaluation and benchmarking systems, the IWA has published three manuals, translated into several languages:

- *Performance indicators in water supply systems - IWA manual of best practices* (2000, 2006)
- *Performance indicators for wastewater services* (2003)
- *Benchmarking Water Services, guiding water utilities to excellence* (2011).

The IWA manuals include a full system of performance indicators which might be used either as such together with other elements, or simplified through to the selection of part of these elements, in order to meet the specific needs of the users. The system proposed comprises six groups:

Figure 1: Performance indicator groups (Alegre et al. 2000; Matos et al. 2003)

Performance indicators for water supply services	Performance indicators for sanitation services
• Water resources indicators	• Environmental quality indicators
• Staff indicators • Equipment indicators • Operation indicators • Service quality indicators • Financial indicators	

It is important to note that these groups of indicators were not designed to achieve specific objectives but rather to be as flexible as possible, so as to be usable by operators and managers who have very different characteristics and objectives, if necessary through contextual adaptations. The concrete implementation of these PI implies that the objectives to be reached have been clearly identified together with the corresponding evaluation criteria. Then, the relevant indicators must be selected, in as limited a number as possible.

The main purpose of these manuals is to provide guidelines for the elaboration of a management tool, based on the use of performance indicators, and usable by a broad scope of stakeholders or managers, in the water supply and sanitation services and utilities.

The benchmarking manual is an operator guide explaining the "why" and "how" of benchmarking.

1_ IWA
2_ AgroParisTech

Performance evaluation using performance indicators

Managers need performance measurements which:

- enable clear and precise objectives to be set;
- constitute a monitoring tool for the implementation of predefined objectives;
- emphasize the strengths and weaknesses of the different services through the identification of corrective measure needs;
- supply key information that enable the activity to be controlled.

Thus, the final objective of any performance evaluation system is to provide information. A distinction must be made between information and data. A correct definition of the term "information" could be as follows: *data which can be used in a decision-making process*. Therefore, a performance indicator system is not only intended to provide the value of a few ratios, but also all complementary elements (quality of data, explanatory factors, context) necessary in appropriate decision making processes. Thus, the performance evaluation system is the result of the examination of all domains of interest, stake holders and influence factors within a given environment. For water supply services, the system includes the operation, the players, the users, the environment, and all related domains which could be monitored for management purposes.

Consequently, a performance evaluation system comprises a set of quantitative performance assessment metrics and corresponding data elements which represent the context and the entity concerned. The classification of these data elements is based on their role within the information system:

- Data elements: the system data base, either measured in situ or easy to obtain. Depending on their nature and role within the system, data elements may be considered as variables, contextual information or simply, explanatory factors.
- Variables: a variable is a system data element which makes it possible to calculate a performance assessment metrics. The variable is composed of a value (resulting from a measurement or a data), expressed as a specific unit, and of its reliability level, which indicates the quality of the data represented by the variable.

Certain of these variables can be obtained from external data, and their availability, the correctness of the reference dates, and the limits of the corresponding geographic zone are not under the control of the operator.

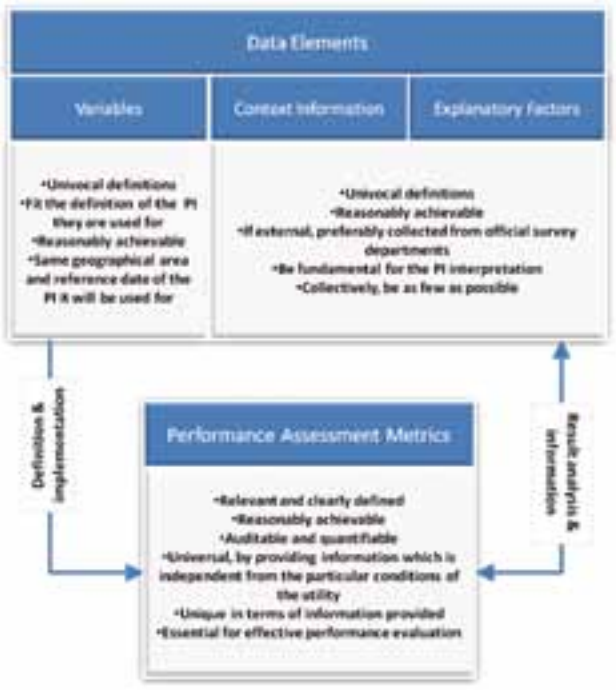
- Contextual information: formed of data elements which provide information on the characteristics of an entity and report the differences between the systems. There are two types of contextual information:
  - Information that describes the context per se and factors exogenous to the system management. These data elements remain fairly constant in time (demography, geography, etc.), and are impervious to management decisions.
  - Certain data elements, on the other hand, cannot be modified by management decisions in short or medium term, yet they may be influenced in the long term by management policies (i.e. the condition of the operating infrastructure).

Contextual information is especially useful when indicators of different entities are being compared.

- Explanatory factors: an explanatory factor is an element of a system of performance indicators which may be used to explain the values of the performance indicators, i.e. the performance level at the analysis stage.
- The performance assessment metrics: measurements of the efficiency or efficacy of urban water supply services. They must always be associated with objectives and evaluation criteria.

It must be noted that the use of performance indicators should always be linked to the implementation of a complete performance evaluation system. In such a system, all the above-mentioned elements must be present and defined, serving either the achievement of a clear objective or the collection of information about specific domains or questions (figure 2).

Figure 2: performance evaluation framework (Alegre & Cabrera, 2011)



Benchmarking

Benchmarking (a.k.a. comparative analysis) is a concept based on two consecutive elements. The first step – performance evaluation – consists in analyzing performance through a comparison with those from other organizations within or outside the economic sector, and in identifying the performance gaps

or deviations. The second step – performance improvement – consists in identifying the best practices and their implementation, following their adaptation to each situation.

WHY IS BENCHMARKING IMPORTANT?

In the water service domain, benchmarking enables authorities and regulators to introduce a form of artificial competitiveness in a domain which is a natural monopoly, so that the service providers in that domain are able to increase their efficacy and transparency. Moreover, benchmarking is an excellent tool for the users of the service and the consumers groups, whose objective is generally to benefit from an adequate service at a fair price. Finally, benchmarking is a very useful instrument for the shareholders who need to examine the service performance and efficacy, as well as the scope of the risks – financial and others - which the entity faces.

THE IWA BENCHMARKING PROCESS

As a general rule, a typical benchmarking process comprises the preparation phase, the performance evaluation phase and the performance improvement phase. Each of these three main phases breaks down into 2 steps (figure 3).

1. **Project planning:** At the start of benchmarking project, the scope and detail level are determined as a function of the requests and needs of the entities involved, the benchmarking model is elaborated and the data requirements are defined. From these elements, a detailed project plan is elaborated together with a budget and a schedule.

2. **Orientation, training and project monitoring:** Prior to the start of the project, the staff must be prepared and informed about the methodology and the data required. It might also be necessary to provide training on the data collection methods that will be applied during the project.
   These considerations concern the staff of the entities concerned as well the staff of the project pilot bodies.

3. **Data acquisition and validation:** participants to a benchmarking project expect high quality comparisons and proper identification of performance deviations, which will be used as triggering elements for their efficiency improvement actions. Thus, once the required data has been collected, it can be validated by the relevant services and by the project team. This control is carried out by comparing the data collected versus the data from the previous years, and by ascertaining incoherent data by means of visits on site or audits.

5. **Data analysis and evaluation reports:** upon completion of data validation and analysis, performance indicators are calculated and the performances from the participants are compared. Performance gaps are then determined and explained, bearing in mind as much as possible the differences that exist between the respective operational environments of the services. The conclusion of this step is the issuing of a preliminary report which sets the milestones for the exchanges on performance gaps that will take place between the participants.

6. **Improvement actions:** the best practices having been identified, the participants are then able to elaborate their own improvement plan. This action plan may differ significantly as a function of the priorities and opportunities of each participant.
   Review of the improvement actions: following the implementation of improvement actions, the results must be evaluated to check whether or not the objectives have been reached. This is usually made during the next comparative evaluation. Moreover, in order for the benchmarking process to be exhaustive, all the results must be documented and evaluated. This comprises not only the lessons learned from the exercise, but also the new needs which have been identified in terms of comparative analysis. It is therefore important to underline the fact that the closing of the cycle provides information that is essential to prepare a new benchmarking process.

Figure 3: IWA benchmarking process (Cabrera et al, 2011)

Preparation		Performance evaluation		Performance improvement	
Project planning	Orientation, training and control	Data acquisition and validation	Data analysis and evaluation report	Improvement actions	Review of improvement actions

Finally, although the benchmarking integrates a performance evaluation phase, the two procedures differ on several aspects (figure 4).

Figure 4: Differences between performance evaluation and benchmarking (Cabrera et al., 2011)

The current challenges in water service performance evaluation

Despite the wealth of experience gained throughout the years (or may be because of the discovery of new possibilities during that period), performance evaluation remains a domain where numerous possibilities are yet to be explored. Problems have evolved and new solutions are required.

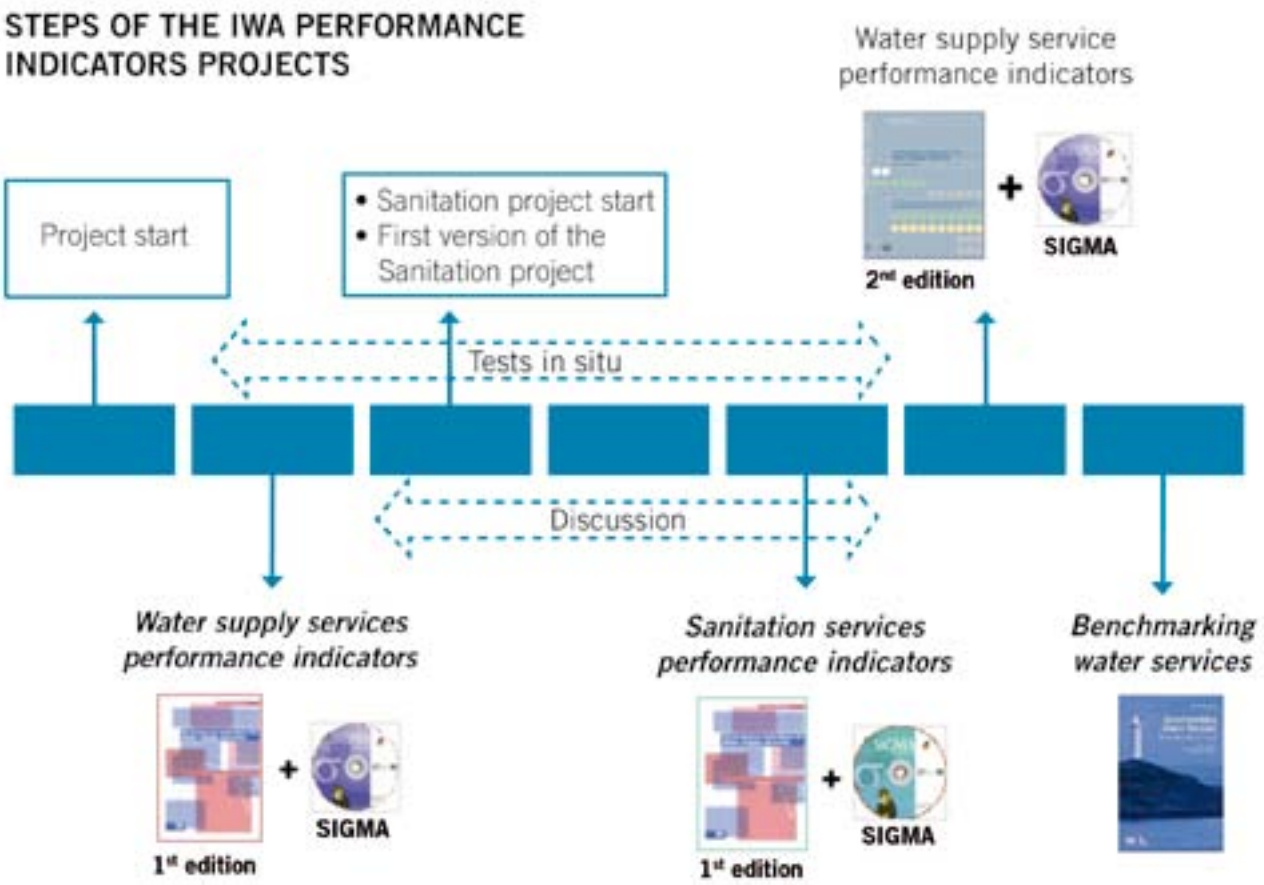
- **Factoring data quality in the decision making process.** Performance measurement systems are and remain the means of a decision making process. Unfortunately, these decisions are often based on poor quality data. The value of a performance indicator says nothing about the way it has been obtained.
  In other words, it is difficult to determine whether the correct value of an indicator, that is based on mediocre data is better than that, lower than the objective, but obtained from correct data. Therefore, the method used to integrate data uncertainty in a decision making process remains a challenge.

- **Synthesis of the results:** results of performance evaluation must often be simplified, regardless of the target: a board of Directors, the press or the general public. However, be it from benchmarking or performance auto-evaluation, the results thus presented can hardly shed a light on some of the most interesting details and may even lead to misunderstandings and erroneous conclusions. The best way to provide a synthetic, faithful and transparent evaluation result remains an open question.

- **Statistical quantitative models versus qualitative evaluations:** In quantitative systems, a complex mathematical model compares performances by establishing relations between inputs and outputs in order to assess the efficacy. These methods offer the advantage of being fair – the evaluation being the same for all – but they necessitate an in-depth knowledge of the equations on which the models are based, in order to avoid erroneous conclusions. In qualitative evaluations, experts review the performance indicator values and take the context into account to appreciate the performance. The successful combination of the two methods is yet to be achieved.

- **Application of performance evaluation to small systems:** for performance indicators, the data available in these systems is often rare or of poor reliability. Resources are also limited, which makes it even more difficult to improve the situation. Finally, they often face urgent problems of higher importance. What is at stake for the future is how to make the performance evaluation and improvement systems useful in such contexts.

Appendice



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PERFORMANCE INDICATORS IN FRANCE: **PROGRESS AND PERSPECTIVES OPENED BY THE PERFORMANCE MONITORING SYSTEM**

Guillem Canneva[1]
Laetitia Guérin-Schneider[2]
& Sylvain Rotillon[3]

KEY WORDS: comparison, information system, performance, measurement, typology, sunshine regulation

Introduction

In France, as in a number of European countries, performance indicators (PIs) for monitoring water and sanitation utilities experienced significant development from the end of the 1990s. In the context of the debate on the possible regulation at national level, different initiatives have seen the light of day. The fruit of this work and the different experiments associating the local authorities (FNCCR), the private operators (FP2E), the State services and research institutions (Guérin-Schneider, 2001), has been used as a basis for the French Ecology Ministry to draw up a list of indicators[4] to be incorporated into the annual reports on the price and quality of the utility (RPQS)[5].

So as to disseminate this information on the performance of water and sanitation utilities as widely as possible and make relevant comparisons, ONEMA[6] has been charged with creating monitoring system compiling both descriptive data and indicators of the French services, known as SISPEA, for Water and Sanitation Public Utility Information System. SISPEA's first official start up year was 2009 (collection of data concerning the year 2008).

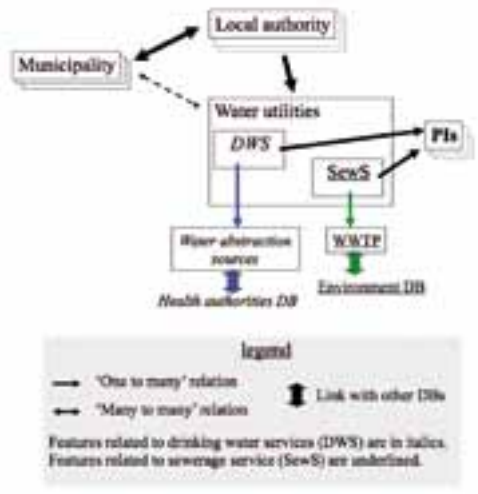
This drawing up of a list of indicators and common definitions has without doubt represented a long and important stage (Guérin-Schneider & Nakhla, 2003; Canneva & Guérin-Schneider, 2011). Yet the success of the SISPEA initiative is best seen in its implementation in the field. This contribution is interested in the functioning and results of this utility performance monitoring system, supposed to make possible comparisons and encourage the use of such indicators.

SISPEA's principles and methods

ORGANISATION OF THE DATA BASE

The structure of the SISPEA data base should be able to be applied to all utilities, regardless of their management mode (delegation or central control) and the type of competent local authority (municipality, syndicate, community). It should also incorporate bridges to other existing data bases, managed by water policing agencies (monitoring of water treatment stations) or sanitation departments (control of drinking water quality). Finally, the performance indicators are completed for each department and each year.

Figure 1: Structure of the data base



1_ AgroParisTech, joint research unit G-Eau, Montpellier

2_ Irstea, joint research unit G-Eau, Montpellier

3_ formerly working at ONEMA

4_ Decree No.2007-675 dated 2 May 2007.

5_ The RPQS is an annual report introduced in 1995 by the so-called loi Barnier in which the Mayor of a municipality (or the Chair of an inter-communal organisation) with competence for a water or sanitation utility should account to its users on the way in which the utility performs.

6_ Office national de l'eau et des milieux aquatiques (National office for water and the aquatic environment), created by the law dated 30 December 2006

The construction of the utility data base, which describes the precise organisation of the competences, represents a stage in its own right. The difficulty lies in the fact that the notion of service does not exactly cover that of the local authority: for the same competence, a given local authority may have different operators on its territory, either to carry out different missions (production and distribution for example), or for geographical reasons linked to the network structure (one municipality's zone served by neighbouring municipality, for example). It is therefore necessary to possess finer knowledge of the management context.

ORGANISATION OF DATA COLLECTION AND RELIABILITY

It is the local authorities competent for water and sanitation which are responsible for completing the data corresponding to their RPQS. Data input is carried out through a portal accessible on internet.

Figure 2: Procedure for the collection of data

The reliability of the data is a major stake. Several mechanisms have been provided so as to guarantee it. The standardisation of the indicators has been specified in a decree and in a circular through detailed data sheets. The method for consolidating the data has also been defined. Finally, data entry is controlled through automated coherence tests, as well as expert analysis by engineers of the local state administration (DDT), who in the event of anomaly re-contact the local authorities.

INSTRUMENT OF COMPARISON – TYPOLOGY OF THE WATER UTILITY

The management context is extremely variable from one service to another. So as to enable comparison, it is indispensible to define classifications which are sufficiently homogeneous with regard to external factors of constraint (size and density of the population to be serviced, the origin and quality of the water resource…). Exploratory work was carried out on test data collected from 2008. On this basis, the researchers[7] proposed a typology based on a statistical approach (Principal Component Analysis) from the most frequently available data: volume sold, number of customers and the length of the distribution network.

First results: a potentially rich tool, which remains poorly supported

WATER AND SANITATION UTILITIES: IDENTIFICATION AND NUMBERS

So as to build a comprehensive data base, the DDT carried out a census of the whole of the services in France. Work of this nature had never been undertaken so comprehensively on a national level. The inventory took account of the special organisation of the utilities (competence for all or part of the service, management mode). The resulting count largely exceeds the estimates which had been previously made on sampling bases.

Table 1: Number of utilities according to their spread (partial or overall service) and their management mode in 2009 *(source: ONEMA)*

		Extent of service			Management mode		
		Overall service	Partial service	**Total**	Delega-tion	Public operator	**Total**
Drinking water *	No. of utilities	12 335	1 704	**14 039**	4 470	9 520	**13 990**
	% population serviced	-	-	-	*62%*	*38%*	***100%***
Sanita-tion**	No. of utilities	12 843	4 524	**17 367**	4 509	12 847	**17 356**
	% population serviced	-	-	-	*44%*	*56%*	***100%***

* Overall service: production, transfer, distribution
** Overall service: collection, transfer, treatment

RATE OF COLLECTION FOR THE FIRST YEAR OF THE OBSERVATORY (2009)

The collection rate remains lower than expectations: in July 2011, only 1,526 water departments and 1,334 sanitation departments had completed their data (covering the year ending December 2009). In both cases, this represents less than 40% of the population delivered. The local authorities, an indispensible link in the chain, were too few in number in inputting their data.

COMPARISON AND TYPOLOGY ESTABLISHED FOR 2009

The statistical[8] analysis enables classifications to be proposed which are based upon combinations of factors mainly linked to

7_ Ch. Wittner (Cemagref, UMR GESTE) and G. Canneva.
8_ For a complete presentation of the results, refer to the article in the magazine Water Science and Technology: Water Supply (Canneva & Guérin-Schneider, 2011).

the size of the service (volume, customers, length of the network) and to the consumption intensity (volume sold compared to the length of the network). However, the context data available still remains too limited to establish classifications which take account of complementary constraints (quality of raw water, water discharge environment, etc.).

Perspectives and conclusions

The creation of a monitoring system with standardised indicators represents important progress in the management of water services in France. Yet, after two years of operation, the results obtained are disappointing. The description of the organisation of competence has improved markedly; but on the other hand, the low level of involvement of the local authorities does not yet provide an overall view of the performance of the utilities.

Certain local authorities have not even realised that the monitoring system exists. However, several studies at the same time show that the system comes up against more fundamental obstacles. Unlike the RPQS, which is obligatory, input to the SISPEA is voluntary. Yet certain local authorities are reticent. Some municpalities, especially those in rural areas, may suffer from a lack of competence in the production of the information requested. Up until now, they have been able to take advantage of technical back-up from the de-centralised services of the State. But the latter's disengagement from public engineering missions has not been compensated for the moment by other public (General Councils) or private (consulting firms) players. Other municipalities would seem equally afraid of the use that is likely to be made of the data.

The lack of data makes any feedback to local players difficult. The representativeness of the data collected is not yet sufficient for the dissemination of reference values. If the trend is not rapidly reversed, it is the very principle of the monitoring system which may find itself threatened: since the constraint of inputting the information is not compensated by an enhancement which enables local authorities to compare themselves with others, the motivation of the pioneers, in terms of participation, is likely to be frittered away rapidly. The appropriation of the tool by the local players will then be compromised. It will not be in a position to play its information role vis-à-vis the users, nor function as a management tool for the local authorities or its mission of regulation by comparison.

It is therefore necessary to envisage the means of strengthening the dynamics. One solution would consist in making the input of data obligatory. However, this measure alone will only have a minimal effect in the absence of any sanction and if the local authorities are not convinced of the interest of the monitoring system.

ONEMA envisages developing links with institutions on an intermediate territorial level. Work to mutualise data with the Water Agencies is in progress and could be followed with the General Councils, many of which are interested in water data. Furthermore, actions aimed at improving the return on investment for the local authorities are essential: communicating better on the existence of the monitoring system, improving the ergonomics of input, publishing each year a national summary and providing personalised documents which may be used by the local authorities (for example a pre-completed RPQS and logs).

SISPEA was born of the necessity to introduce more regulation in the management of water and sanitation utilities: without casting doubt upon the de-centralised management of the utility, the solution adopted was regulation through the dissemination of centrally-organized information. Moreover, it could be hoped that providing local authorities with more responsibility in the context of the disengagement of public engineering facilities would incite them to use the monitoring system as a tool for managing the utility. But if this initiative does not achieved its objectives, the debate around a mode of stronger and centralised regulation has every chance of coming to the fore yet again. This is all the more true since the environmental requirements threaten to lead to an increase in the price of water. It could play the same role of detonator with the users that in its time the increase in price linked to the directives on drinking water and residual urban water played.

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REGULATORY PERFORMANCE INDICATORS: ESSENTIAL QUALITY AND NON-QUALITY INDICATORS FOR THE PERFORMANCE OF PUBLIC WATER AND SANITATION SERVICES

Maria Salvetti[1]

KEY WORDS: quality cost, reduction of non-quality, failure

There are several regulation models in the public water and sanitation service field. In France, the governance of water and sanitation services is based on "sunshine regulation", which entails the promotion of service performance and best practices. This system mainly depends on the definition and monitoring of performance indicators designed as coordination tools for target results. These instruments of good governance enable operators to reach a given service level quality and ensure user satisfaction. The performance indicators thus make it possible to assess the efficiency of a service in relation to the results expected, both in terms of quality improvement and non-quality reduction as well as the cutting and control of associated costs. Indeed, although "quality is expensive, […] there is something even more expensive than quality, i.e. its absence" (Jocou, 1992). Moreover, investigating the performance of a service involves looking at its ability to achieve a quality target in the most efficient manner. The question of performance is therefore directly linked to the question of how to reduce the cost of obtaining quality. How can regulatory performance indicators help to answer this question? How can they be integrated into a coordination system enabling, among other things, to control the cost of quality and reduce the cost of non-quality? Furthermore, do they properly cover and describe all of the challenges associated with this issue?

In order to answer these questions, it is first necessary to define what the cost of quality covers and show how these concepts can help to build a framework for interpreting the regulatory performance indicators applicable to public water and sanitation services.

Cost of quality: definition and characterisation

The concept of the cost of quality (COQ) was theorised in the United States in the 1950s when the first quality assurance systems were set up. The COQ is made up of the costs incurred by investing in quality (CIQ) and the cost of non-quality (CNQ). French standard NF X 50-126 provides a guide for assessing the cost of non-quality based on the classification and definition of the different components making up the cost of quality:

The Cost Of Quality (COQ)

CIQ	
Detection costs	Prevention costs
Expenses associated with checking the conformance of products to quality requirements, i.e. the cost of looking for anomalies	Human and material investments associated with checking, preventing and reducing anomalies or failures, i.e. the cost of actions targeting the cause of anomalies
CNQ	
Internal failure costs	External failure costs
Costs incurred when the product does not meet quality requirements before leaving the company	Costs incurred when the product does not meet quality requirements after leaving the company

It is interesting to note the difference between endured costs (internal and external failures), which correspond to non-quality costs, and agreed costs (detection and prevention), which reflect determined action. As the quality approach is gradually developed, detection and prevention costs, agreed costs or CIQ increase while endured costs or CNQ decrease.

1_ ONEMA

Thus, in a dynamic approach, the continuous improvement of quality leads to a lower total cost of quality (COQ).

Application of the COQ concept to regulatory performance indicators for public water and sanitation services

In the public water and sanitation service field, regulatory performance indicators (French decree and order of 2 May 2007) can be used to appraise, characterise and assess quality and non-quality to a certain extent. Using the definition of quality costs described in French standard X50-126, the following classification of regulatory performance indicators for quality and non-quality can be put forward:

Quality indicators	
Detection indicators	Prevention indicators
Distributed water sample conformance rate with respect to microbiological (P101.1) and physical and chemical parameters (P102.1)	Resource protection advancement index (P108.3)
Conformance of the collection of effluents to the specifications defined in application of decree 94-469 of 3 June 1994 modified by the decree of 2 May 2006 (P203.3)	Knowledge index pertaining to discharges into the natural environment (P255.3)
Conformance of waste water treatment facilities to the specifications defined in application of decree 94-469 of 3 June 1994 modified by the decree of 2 May 2006 (P204.3)	Network asset knowledge and management index (P103.2 and P202.2)
Conformance of the performance of waste water treatment facilities to the specifications defined in application of decree 94-469 of 3 June 1994 modified by the decree of 2 May 2006 (P205.3)	Duration of extinction of the debt (P153.2 and P256.2)
Conformance of the performance of waste water treatment facilities in relation to instructions outlined by the water police (P.254.3)	Average network renewal rate (P107.2 and P253.2)
Rate of sludge produced by waste water treatment facilities and evacuated in compliance with regulations (P206.3)	Number of collection network points requiring frequent dredging operations every 100 km (P252.2)
Non-quality indicators	
Internal failure indicators	External failure indicators
Network efficiency (P104.3)	Rate of occurrence of non-programmed service interruptions (P151.1)
Linear index of unaccounted volumes (P105.3)	Rate of overflow of effluent into users' premises (P251.1)
Linear network loss index (P106.3)	Rate of claims (P155.1 et P258.1)
	Rate of compliance with maximum deadline for opening connections for new subscribers (P152.1)

Regulatory performance indicators can be sorted into two main categories: quality indicators and non-quality indicators. Each category can then be sub-divided. Quality indicators are split between detection and prevention indicators. Non-quality indicators can be internal or external failure indicators.

In the light of this classification, regulatory performance indicators can therefore be seen as a tool for coordinating public water and sanitation services making it not only possible to improve service quality but also to lessen service non-quality and associated costs. Thus, indicators P151.1, P152.1, P251.1, P155.1 and P258.1 are rates used to assess certain external service failures. By observing and monitoring these indicators, the external failures noted can be quantified and reduced. The same applies to internal failure indicators: network efficiency (P104.3), linear loss (P106.3) and unaccounted volumes (P105.3). These indicators must be assessed before they can be rectified. The aim of detection indicators is to check the conformance of service to quality requirements: the conformance of water distributed through the user's tap (P101.1 and P102.1), the conformance of facilities or their performance (P204.3, P205.3, P254.3, P203.3), or the rate of sludge evacuated in the proper manner (P206.3). Finally, prevention indicators are used to check, prevent and reduce failures. Thus, indices relating to asset knowledge (P103.2 and P202.2), knowledge of discharges into the environment (P255.3) or resource protection advancement (P108.3), the average network renewal rate (P107.2 and P253.2), the duration of extinction of the debt (P153.2 and P256.2), or the number of collection network points requiring frequent dredging (P252.2) are indicators used to check, prevent and reduce possible technical, financial or environmental anomalies.

The COQ goes beyond regulatory performance indicators

The regulatory performance indicators applicable to public water and sanitation services are thus important factors for improving quality and reducing non-quality in services. However, these indicators alone cannot control quality and reduce non-quality. For instance, in a sanitation network there are other failures resulting from non-quality, such as obstructions, leaks, bursts in piping or overflow problems, which should also be taken into account. These failures generate costs in that they have to be repaired but they can also incur legal, economic, social, environmental and health-related costs. For example, when a drinking water pipe bursts, this entails economic and financial costs to cover the pipe's urgent repair and therefore generates non-programmed expenditure. Other costs might be added such as the delivery of bottled water to ensure service continuity (cost observed in 2011 in the Marne sector when bottled water had to substitute the failed drinking water supply: €800/day for a community of 2,300 inhabitants). Furthermore, the water utility

may have to pay financial damages by way of compensation if the courts decide this is applicable. In some cases judged in the administrative courts in France, the damages to be paid out following a burst pipe can amount to over 100,000 euros.
The cost of non-quality can also be environmental and social. A burst waste water pipe or substantial storm drain overflow can lead to the contamination of resources and aquatic environments, as was the case in 2001 at Lake Aiguebelette in the Savoie region, the third largest natural lake in France. This type of sanitation service failure can lead to beaches being closed and bathing being banned hence generating a substantial financial loss for local tourist activities. More generally, such failures can have considerable financial consequences on local economic activities (tourism, fish-farming, etc.) and on recreational activities (bathing, walking, fishing, water-based activities, etc.).
The damage caused by sanitation service non-quality also has fallout in terms of its negative effects on the natural surroundings and aquatic environment. At the point where the small and large water cycles meet, such damage is not easily quantifiable but is far from being negligible. The appendix to the document on assessing the benefits of a change in water state (*Evaluer les bénéfices d'un changement d'état des eaux*) provides guidance-value tables that could be used to appraise the environmental consequences of sanitation service failures from a monetary perspective.

The challenges relating to quality, non-quality and associated costs are central to the implementation of regulatory performance indicators. These indicators are coordination tools to be used in a dynamic approach to the continuous improvement of service quality. Thus, quality does not stem from service performance alone but is its main driver. However, regulatory performance indicators cannot alone cover all the possible means of improving quality and reducing non-quality in public water and sanitation services. Each utility must strive to complete this list as part of a determined and innovative approach. The issue of improving quality and reducing non-quality and associated costs thus appears to be crucial in a context where drinking water consumption is being reduced (1% a year since 2000), national and European health and environmental standard requirements are increasingly stringent and service facilities are ageing. It is a central and inescapable factor to be taken into account in future public water and sanitation service policy.

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French standard NF X50-126: « Guide d'évaluation des coûts résultant de la non-qualité »

INVOLVING USERS IN THE DEBATE ON **SERVICE PERFORMANCE?**

Rémi Barbier[1]
& Marie Tsanga[1]

KEY WORDS: Advisory Committee, participation, Aarhus convention, citizens' jury, focus group

While the notion of performance has only recently been introduced into the public service management paradigm[2] and exploited to justify action, the questions it raises are increasingly important in research agendas. But this new constraint nevertheless poses fundamental problems when it comes to defining and evaluating the issue of performance.

Indeed, the water sector has been marked on the one hand by technical requirements and the public-private hybridization of values, and, on the other hand, by the emergence of new social issues, by the emphasis put on the three E criteria (economy, efficiency, efficacy) in evaluating the efficiency of public action that has been called into question due to the waning symbolic impact on the public interest it induced[3] and the resulting blurring of the lines that separate public from private. Furthermore, the "tyranny of performance indicators"[4] has induced a trend that favors a preoccupation with immediate results (economy and the quality of services) to the detriment of long-term effects, in other words, the capacity of the public sector to contribute to the resolution of public problems.[5]

While a number of approaches exist to help flesh out performance criteria, there is no real consensus as to what constitutes good criteria. In other words, in this multi-actor sphere and due to the inevitable conflicts of interest associated with the management of such an essential public resource, what constitutes good performance is not self-evident – it must be elaborated. This prerequisite raises the question of how this should be done and whether all interested parties – notably citizen-users – should participate in this process, both upstream (defining proper performance criteria) and downstream (assessing said performance).

In fact, the participation of citizen-users has gradually been broadly accepted as standard procedure in environmental public action, at all stages of implementation. The 1998 Aarhus Convention established it as a legally binding standard and a basic human right. In France, the notion was enshrined by article 7 of the Environmental Charter adopted in 2005. Aside from its capacity to bolster a "citizenship of public affairs,"[6] participation is sustained by several broad operational justifications: it is likely to boost confidence in public institutions and facilitate the acceptance of decisions taken; it would also reduce – if not eliminate – conflicts by modifying the relations between protagonists through dynamic social apprenticeships; and finally, it would improve the quality of the decisions taken due to the contribution of the know-how and the values of the interested parties and affected groups.

Citizen involvement in performance assessment poses little problem. While the consideration of quantitative studies or the analysis of complaints expressed by users cannot be ignored, organized participation can contribute to establishing a dialogue on the criteria and results of the performance assessment. Three principle protocols are mobilized to this end: the commission, public debate, and mini-public hearings. We will review their advantages and disadvantages in this brief analysis.

The commissions should be associated, at least in France, with the long-held tradition of consultative administration, in as much as the emerging democratic configuration confers on them new importance and visibility. P. Rosanvallon[7] has portrayed the "public commission" as a key institution that he has characterized as interactive democracy, which resembles the contemporary form of public-action legitimacy called "proximity". In this regard, water and wastewater services are directly affected by local public services consultative commissions (commissions

1_ IRSTEA and ENGEES, UMR GESTE

2_ Gibert P. (2007), « Les enjeux contemporains de l'action publique locale », La gestion publique de l'eau, Nouvelle gouvernance et démocratisation de l'action publique locale, Actes de la 1re journée d'échanges et de réflexion de recherche-action Cemagref – Nantes métropole, pp 7-10

3_ Argyriades D., 2003, « Values for public service: lessons learned from recent trends and the Millennium Summit" *International Review of Administrative Sciences* 2003, 69: pp 521-533

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5_ Varone F., 2008, « De la performance publique : concilier évaluation des politiques publiques et budget par programmes ? », Politiques et management public, 26(3), pp 77-89

6_ Expression also introduced by Sauvé J.-M., *Conférence inaugurale du Cycle « La démocratie environnementale aujourd'hui »*.

7_ Rosanvallon P., *La légitimité démocratique : Impartialité, réflexivité, proximité*, Paris, Seuil, 2008.

consultatives des services publics locaux - CCSPL), a legal entity established by the 1992 ATR (Administration Territoriale de la République) law, and bolstered by the 2002 democratic proximity law. A CCSPL commission brings together political representatives and user representatives; among its duties is the examination of the annual report on the price and the quality of drinking water and wastewater services.

Generally speaking, the scope of the CCSPLs' action is deemed to be inadequate, and their track record disappointing; too often they remain formal settings and their import depends largely on the whims of elected officials. These observations are similar to those often made regarding commissions. They are very often only consultative and enjoy little autonomy. The possibility of requesting "third party" appraisals, an emphatic demand often raised in environmental issues, is rarely provided for. As to the CCSPL recruiting and operation, a number of salient characteristics can be highlighted. Access to these participative bodies can involve actual costs to non-professionals: material costs, in time and money, and even higher in the case that the proliferation of procedures that call on a relatively small number of associations; cognitive costs in the comprehension of complex issues, often split up and produced by different parties in which pertinent information is difficult to ascertain; symbolic costs associated with having to appear and speak in public. These costs could drive some away or cause them to take a back-seat role, clearing the way for representatives with more substantial means.

These analyses also underscore the internal operational difficulties of these commissions: objectives are not always clearly defined, which can lead to misunderstanding and frustration; "subject material for debate" may be lacking for a number of reasons, which could gradually sideline the process; the way the meetings are conducted may be faulty – the juxtaposition of differing points of view dominate the discussion and it is not always easy to identify real decisions in an unstructured series of speeches of which the minutes only provide a "filtered" version of the meeting. While the future of commissions is not in doubt, the only way they can gain greater legitimacy and efficacy is by overcoming identified obstacles and increasing operational effectiveness.

One might also look toward easing restrictions on the performance debate by opening it to the general public, according to the public debate model developed in France by the Commission Nationale du Débat Public (CNDP). This type of debate aims to collect and organize feedback in an open manner from all those concerned with an environmental issue. It represents a real innovation in terms of participation by deploying well-established principles that are most likely to foster quality deliberations: publicity, transparency, parity (equal speaking time for all protagonists), neutrality, independence, and argumentation. However, the actual way the debates are conducted falls short of the mark. According to Martine Revel,[8] for example, the debate "is based on a rationale in which exchanges are carefully controlled and projects are broken down according to theme." Furthermore it assigns roles (the public must be assiduous) and leaves little room for the public, whose share of speaking time, according to the cases studied, was only 10 to 20% of the total speaking time. But, the author continued, the strictly controlled format and the role assignments are never so formidable as to prevent, even if it is sporadic, "the spontaneous interjection of an independent voice," in other words "a voice that is not affiliated with an identified interest or group." To our knowledge, no organized public debate has been devoted to the problems facing performance assessment, but a format could easily be envisaged and adapted for that purpose.

Quality deliberations could also be achieved within a more limited, mini-public framework, that gathers together a small number of people. The jury or citizen panel is one of its emblematic forms. The selection of a jury, gradually codified over the years, usually takes place as follows: members are selected by random draw, while ensuring a diverse socio-demographic profile; it receives its mandate from a public authority; its members, usually about fifteen, are given a basic understanding of the topic, generally over a weekend; a second weekend is devoted to questioning experts, witnesses, and stakeholders; a final weekend is dedicated to deliberation followed by a written report, potentially assisted by coordinators, in which an opinion is given to the sponsors, who usually commit to respond to the opinion by indicating and justifying what steps or actions it intends to take. This participative format is relatively recent in France, but it has been used for a number of years in Germany, the U.S., Great Britain, and Spain. One of the difficulties in selecting a jury is obtaining representatives of all socio-demographic categories. Disadvantaged and young people are difficult to mobilize. One option may be to directly co-opt representatives of these categories through contacts with clubs or associations.

These mini-public formats can provide certain appreciable advantages: notably, a real capacity to deliver reasonable opinions and provide political insight to decision-makers by giving them a test debate format from which they can identify viable arguments, public equity criteria, and values. It might also be added that they contribute to focusing verbal debate on the common good instead of individual interests. However, several aspects also underscore its limits. If a jury is convened and prepared for optimal deliberation, the actual debate often fails to live up to expectations. C. Bedu[9] pointed out that in the case of a jury devoted to drinking water governance, many elements of the public opinion were "conceded" to the developer or apparently agreed to by consensus. Furthermore, notwithstanding the seriousness of the work accomplished, a

8_ Revel M., « Les dynamiques du débat public : l'exemple de six débats publics », in Revel M. et alii (dir.), *Le débat public : une expérience française de démocratie participative*, Paris, La Découverte, 2007, p.239-251.

9_ Bedu C., *Quand une citadelle technique se (sou)met à l'impératif délibératif. Récit et analyse pragmatique d'une procédure de type 'mini public' dans le domaine de l'eau potable*, Thèse de sociologie, Université de Strasbourg, 2010.

certain triviality has been noticed in the propositions contained in the citizens' opinion. The triviality is probably due in part to the "moral responsibility" shouldered by the citizens who were asked to assume unusual responsibilities, which could lead them to fall back on consensual proposals[10]. And finally, the strength of these mini-public formats – their eminently artificial nature – is also a weakness: these contrived procedures rarely have a strong impact on the eventual debates and controversies – and consequently, on the decisions. But they can be more readably adapted to the purpose of deferred deliberations and not deployed during periods of controversy.

To a certain extent, focus groups represent a variation to the mini-public format. They enable the mobilization, either together or separately, of individuals with diverse backgrounds over periods much shorter than in the jury format. They can, for example, provide the framework for performance assessment criteria deliberations by widening these discussions beyond technical and instrumental dimensions toward issues related to "public values" [11] that citizen-users expect to be implemented. Following a similar qualitative inquiry that was conducted in an urban water service company, a list of public values associated with modern water management emerged[12]. This participative approach for identifying public values provided an opportunity for players to debate service performance by questioning its content with regard to criteria that correspond to a shared concept that was collectively derived[13]. Such an approach is likely to elicit a shared sense of public service, even constituting an ethic that implicates not only the political players and water distribution managers, but also the citizen-users who are beneficiaries of the public service.

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THE VIVAQUA BALANCED SCORECARD FOR A FLOOD OF ADVANTAGES

Christiane Franck[1]

KEY WORDS: objectives, steering, performance indicator, Belgium

When a Balanced Scorecard (BSC) is really integrated into the strategic and operational life of a company and is supported by senior management – a sine qua non condition – it acts as a genuine coordination and management tool. With a balanced and consistent design reflecting corporate culture, it is followed on a monthly basis in order to pinpoint weaknesses and, even more importantly, imagine ways to quickly overcome these.
By making its BSC reflect its objectives, Vivaqua is able to fulfil its mission and accomplish its corporate project.

General principles

The Balanced Scorecard is a management concept that 'translates' the strategic objectives of the corporate project into measurable objectives (SMART[2]), monitors their accomplishment according to a pre-determined schedule and makes it possible to quickly react to any drift or delay in realisation.

The difference in relation to a traditional performance chart lies in the balance sought between four main areas, hence the term 'balanced':

- **financial results:** inescapable aspect for any company, whether it be private or public,
- **customer satisfaction:** are the company's achievements in line with its customers' real expectations?
- **operation of internal processes:** are these organised in such a way as to make it possible to reach the target set out?
- **the organisation's innovation and ability to learn:** are the human resources trained, skilled and motivated to fulfil the company's objectives?

Objectives and indicators are set for each of these fields. The model is therefore not purely financial and stresses the importance of a balance between different levels, between short-term and long-term objectives, and between stability and change.

The BSC is not just the latest fashionable tool but an overall system that has proved its worth over time, both in national and international companies and in the private and public sectors. Thanks to its generic aspect, the scorecard can be linked to benchmarking, which allows the company to set objectives by comparing what it does to the outside world.

Setting up of the BSC at Vivaqua

The main objectives of Vivaqua are to guarantee the quantity and quality of the drinking water supply to one fifth of the Belgian population and to ensure the continuous collection and treatment of waste water, mainly in the Brussels region but also in the Flemish region. It is a publicly owned company that promotes the public management of water and which uses its figures to demonstrate its competitiveness. This is why it launched a benchmarking approach and a Balanced Scorecard approach, to promote its transparency and its constant efforts at improvement.

The BSC project was launched in 2008, at the request of the company's General Management. A working group was set up. This included 4 people, each from a key entity in terms of the project:

- Finance and Accounting
- Processes and Strategy, to ensure the scorecard was properly integrated into the existing system and cancel out any redundant tools
- Total Quality Management, to establish a link with the quality management system, based on the ISO 9001 standard for which Vivaqua has been accredited since 1995 (Vivaqua was the first Belgian public enterprise to achieve certification)
- General Management, to ensure coordination of the project and link it in with company management.

External two-day training was organised to review the BSC principles and find out more about the different steps needed to set up such a project. Following the first day of training, the

1_ Vivaqua
2_ Specific, Measurable, Achievable, Realistic, Time-Bound

members of the working group drafted a first version, which was then discussed and developed with the help of the trainer over the course of the second day.

This first draft was based on objectives from the corporate project. The working group systematically sought one or several performance indicators to reflect the fulfilment of each objective as best as possible. The overall project was presented to the General Manager and the Management Committee to obtain their feedback and go-ahead to develop the project further.

The working group then submitted the proposed indicators to the managers of the processes included in the BSC. This phase was very important and critical given that, on the one hand, the chosen indicators had to be relevant and, on the other hand, the process managers had to be involved in the project.

In June 2009, the results of the first four months of the Vivaqua BSC were commented upon by the Management Committee. Since then, the results have been followed monthly by the Management Committee and quarterly by the Board of Directors.

Composition of the Vivaqua BSC

The Vivaqua BSC comprises 38 performance indicators and reflects the following information (see box):

- the strategic objective to which one or several indicators are linked
- a code indicating whether this indicator is also monitored as part of international benchmarking (European Benchmarking Cooperation)
- the objective for the year concerned
- the monthly or quarterly values, in red if they are negative in relation to the objective, in green if they are positive (the box illustrates the data for June, July and December 2010 - J, J, D)
- the overall value
- a coloured dot to indicate whether the overall result is positive (green) or negative (red)
- indication of the type of indicator: a performance indicator is an indicator that can be acted on directly (e.g. monitoring of the investment budget at distribution level), a monitoring indicator reflects important results for the company but involves long-term actions (e.g. the monthly drinking water production figure based on customer demand).

Advantages

The advantages stemming from a BSC approach certainly offset the time and energy needed to put it in place.

The synoptic view. Listing the periodic results for each objective, the strategic scorecard provides the Management Committee with a clear and instant vision of the company's health status and can underline points to be improved.
Example: this instant, clear view allows presentations before the Management Committee to be kept to a minimum length and the focus to be placed on the red dots.

The balanced vision. Strict objectives are set for activities other than purely financial, reflecting a preventive and sustainable vision.
Example: achieving 80% of the organic framework (framework indicating the staff necessary for the company to function properly) may constitute a significant financial benefit, but can also cause problems in terms of human resources (knowledge not being passed on, delayed replacements for key positions, non-achievement of preventive controls, etc.). By setting the objective at 95%, senior management demonstrated its acute focus on the sustainable and preventive aspects of the company's management, to the detriment of direct financial gains.

The link with benchmarking. Setting objectives based on previous results and financial and other types of forecasts is part of normal corporate management. However, if these results and objectives can be compared with other companies in the same sector or firms demonstrating a best practice in a given field, better results can be achieved. Benchmarking and the Balanced Scorecard go hand in hand.
This is why Vivaqua has integrated a number of indicators into its BSC that stem from the international benchmarking approach in which it participates, such as the production of drinking water, incidents on sanitation networks, the average cost of producing a m³ of water and the number of compliant waste water treatment analyses.

Short and long-term vision. As well as the monthly monitoring scorecard, another scorecard can be developed to show the annual results. This scorecard pinpoints the trends and the results of investments in the medium and long-term. It also reflects the results of strategies, which are generally determined for a five-year period or more.
Example: the indicator concerning incidents on the sanitation network will, in the long-term, reflect the multi-yearly investment programme for the sewerage network in the Brussels Capital Region.

Monitoring of critical activities. Although the scorecard normally only lists strategic indicators, other critical indicators can be included on a temporary basis. These may be linked to a new activity, an activity that is struggling or an activity that is urgent or important and which needs to be closely followed for a given period of time.
Example: European legislation pertaining to the eradication of lead requires water companies to replace all lead pipes before 2013. Although this is not a strategic activity, it needs to be monitored to ensure that Vivaqua is fulfilling all of its obligations and that its connections comply with European legislation within the given timeframe. This indicator has therefore been integrated into the BSC.

Internal and external interest. Credibility through the eyes of the outside world improves when statements can be backed up with concrete figures.
Example: many companies say they are concerned about the environment. If they can support this with a concrete figure, the message becomes more credible. Vivaqua has included an objective to decrease CO_2 emissions in its BSC. This figure can be used whenever needed to demonstrate its environmental concern.

Compatibility with ISO 9001. A quality management system based on the ISO 9001 standard and a BSC makes perfect sense. The two approaches are complementary. In fact, the BSC provides the answer to the two requirements of the ISO 9001 standard, that concerning process efficiency and that relating to continuous improvement.
Example: setting up the BSC has allowed Vivaqua to meet a long unmet need for corrective action: today the company is able to demonstrate the suitability and efficiency of its quality management system.

Cross checking. All BSC indicators link up either directly or indirectly with each other. This means that they can be cross checked and problems or off-spec results quickly detected. The Management Committee might otherwise be unaware of such sticking points, which may, in the long term, have a financial impact or other important consequences.
Example: the water network efficiency indicator is given by the ratio of water produced to water invoiced. If water is lost on the network this generates a negative result, which can then be compared with the "discharge and loss" indicator. If the latter indicator does not reflect a similar trend, the negative result may be due to an invoicing problem.

Tool fostering communication, involvement and motivation. A top-down roll-out of the BSC can facilitate the communication of strategic objectives and increase employee involvement by underlining the effects of specific actions on their underlying indicators.
Example: the rate of frequency and severity of occupational accidents. Some management teams have worked with the prevention and protection team to set up additional safety training workshops in order to reduce the number of occupational accidents to a minimum. These teams have seen the result of this action reflected in their indicator, but also in the strategic indicator listed in the BSC.

In practice

When setting up a BSC, it is essential to ensure management and people in charge of processes show their full support for and involvement in the project. A BSC does not make sense if it is seen as something imposed from the outside.

Furthermore, there is no point having unending discussions about the relevance of a given indicator. A good indicator should be simple (reflecting the overall health status of an activity), clear (making it possible to take the right decisions) and easy to communicate (fostering employee buy-in). Vivaqua has opted for frequent but short meetings limited to one hour. The thinking time allowed between two meetings makes it possible to focus on the essential points and prevents unending discussions about a given indicator.

Going back to the same old routine once the work is done would be a grave error and contrary to the proper management of a company and to the spirit of the BSC. A lot of work is involved in the roll-out and continued development of the BSC. But it is above all reassuring to know that when a BSC that has been properly integrated into the company's strategic life is improved, this will also improve the company itself.

IMPLEMENTATION OF 2 PERFORMANCE MANAGEMENT TOOLS FOR PUBLIC SANITATION SERVICES IN THE ILE-DE-FRANCE REGION (SIAAP)

Michel Riotte[1]

KEY WORDS: Scorecard, assessment, Agenda 21, sustainable development

The SIAAP (*Inter-départmental* syndicate for sanitation in the greater Paris region) manages the transport and treatment of wastewater for 8.5 million inhabitants of the Ile-de-France region. Every day, the 1700 technicians of the syndicate depollute 2.35 million m^3 of rainwater and household and industrial wastewater. This wastewater is sent to 5 plants: downstream Seine, upstream Seine, central Seine, Seine Grésillons and downstream Marne.

In the framework of its organizational and environmental management processes to improve performance, two essential tools were developed: **a general management scoreboard and an Agenda 21 action plan**.

The general management scoreboard – a tool to measure and assess performance

Since early 2006, the SIAAP has developed and implemented a scoreboard that is shared by all of the functional and operational divisions. It is disseminated and analysed on a monthly basis during Management Committee meetings and is a tool for early warning, dialogue and steering of performance. It comprises a selection of indicators that are:

- in line with SIAAP strategies;
- representative of the utility's activity;
- easy to measure;
- an integral part of the management process in each division;
- supplemented by targets that are revised yearly.

The indicators fall into two main categories: operational indicators (associated with the operation of the plants and the network, safety and the environment) and general indicators (human resources and finance). They are for the most part monthly, measured on a current month and year-to-date basis, with a comparison for the same periods from the previous year.

There are several types of operational indicators, including a series of context indicators (flow rates, quantity of sludge produced, pollution inflows, etc.) not supplemented by targets, which are necessary to understand the operation of the plants and the network.

The tracking and analysis of **"treatment performance"** (non-conformities in the water, sludge treatment availability, state of sludge recycling chains, etc.), **"environmental nuisance"** (spills, complaints about odours, etc.) and **"safety"** (number of occupational accidents, frequency and severity rates) indicators is used to ensure that objectives are reached, to warn about possible drifts, and to set up corrective action plans.

This is also the case for the use of the so-called general **"human resources"** and **"finance"** indicators.

The reporting on these different indicators makes it possible to monitor the main objectives assigned to the different divisions, such as:

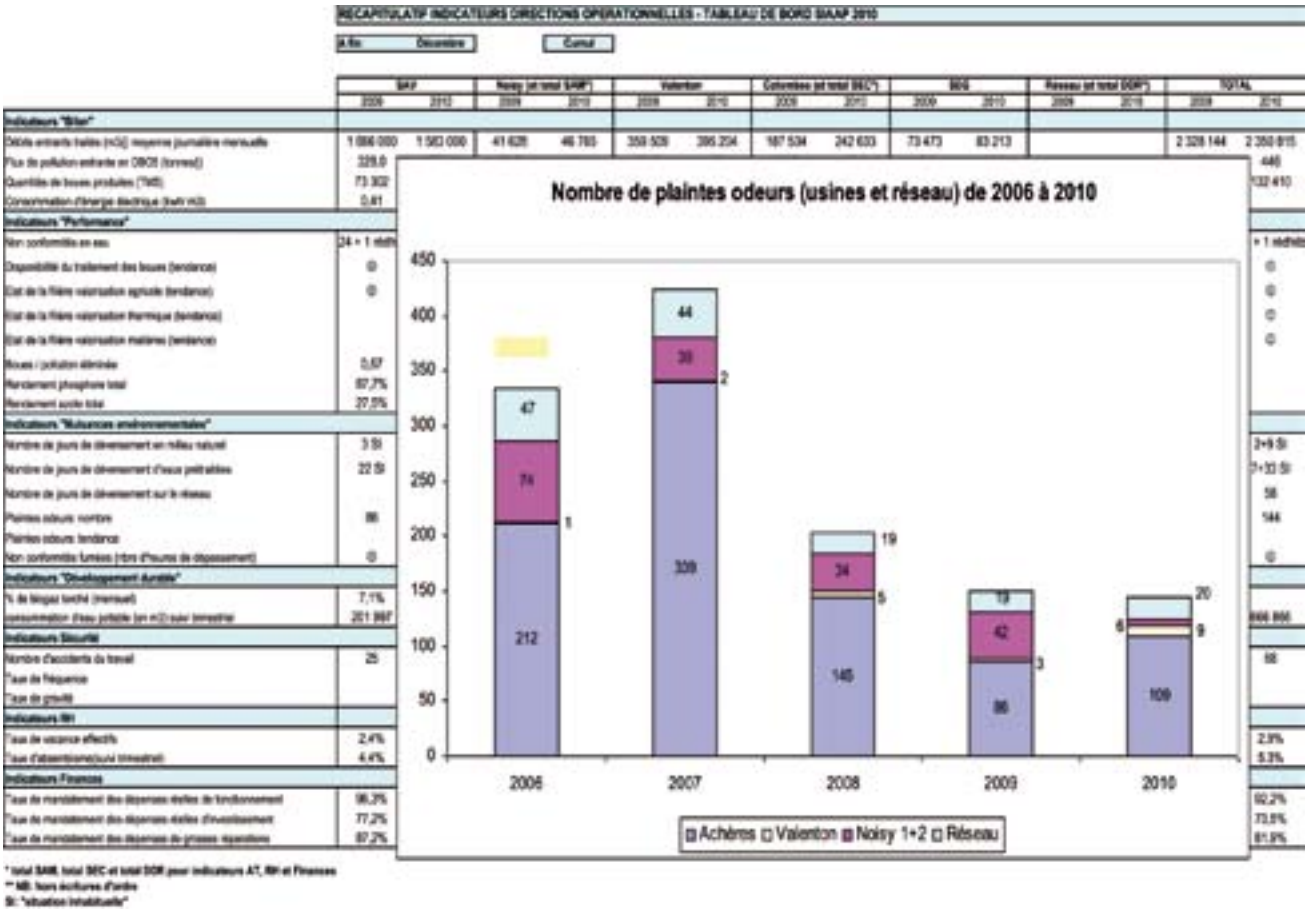
- Analyse the results obtained to report and plan;
- Correct any potential deviations between the results and the targets;
- Adopt a **global vision** to steer actions plans towards maximum efficiency;
- **Assess performance** on a monthly, annual and pluri-annual basis.

The feedback acquired from these first years shows that the effectiveness of this tool resides in:

- **Reliable** data with comments about operating events;
- A **restricted** number of indicators;
- A presentation that is **clear for everyone**;
- Regular updates and quick data feedback;
- A climate of trust.

1_ SIAAP

Example of a monthly and pluri-annual reporting table (complaints about odour from 2006 to 2010)



The data displayed on the scoreboard is presented monthly to the management committee, regularly to the supervisory staff and annually to the Board of Directors. The highlights of the previous period are commented by the different divisions. The quarterly and annual reports present the observed trends and the evolution of the indicators with respect to previous years.
The indicators and targets are updated annually according to objectives. They may be represented differently, either as numbers, percentages or smileys.

The SIAAP Agenda 21 plan – a sustainable development policy implementation and assessment tool

SIAAP's sustainable development policy was set up gradually. The first actions were carried out as of 2003, structured as annual "Agenda 21" action plans that were then formalized as of 2008. These action plans are approved each year by SIAAP's Board of Directors. What's more, an awareness raising program for technicians was finalized in 2008 by the signing of a reciprocal agreement between SIAAP management and technicians. The policy is consolidated and reinforced according to the Grenelle 2 environmental law.

The current policy of the SIAAP is organized in the following way:

- **The Agenda 21 commission**, stemming from the Board of Directors, steers and assesses the sustainable development policy implemented by the SIAAP.

- On 16 December 2009, the Board of Directors adopted a **sustainable development strategy** that sets medium-term directions. The strategy comprises 5 ambitions, detailed by 25 strategic goals, creating a framework for action for several years:
  - Participate in the sustainable planning of the greater Paris area
  - Contribute to the improvement of health and the living environment
  - Be a public service that is attentive to social and societal expectations
  - Preserve ecosystems and natural resources
  - Fight against climate change

- **The annual Agenda 21 action plan** is a tool used to roll out the sustainable development strategy for sanitation services on an operational level in the Paris region. This action plan is updated yearly. It is based on the strategy's 5 ambitions and is monitored by two committees:
  - **SPAA21 committee** (monitoring of the agenda 21 action plan)

> 6-month monitoring with the directors and general management
> Overall steering of the actions, assessment and re-centering.

- Quarterly **Monitoring Committee**
  > with **correspondents** on each site and in each division
  > examination and monitoring of the Agenda 21 action plan

RESULTS OF THE ACTIONS CARRIED OUT

The Agenda 21 actions for 2011 were associated with the main achievements of 2010.
For example, **we can mention from among the actions carried out in 2010:**

- Sustainable planning
  - Instrumentation of the Networks Division – 57 points on the network were instrumented in order to measure the surplus volumes during rainy periods.
- Health & Living environment
  - Roll-out of the SYPROS tool for real-time monitoring and 48-hour forecasting of odours in the environment near the transport and treatment installations.
- Social and societal expectations
  - Attendance results at the Cité De l'Eau et de l'Assainissement, setting-up of educational workshops, hosting of 1500 school children, large dissemination of an educational booklet to the schools in the d'Île-de-France region.
- Conservation of ecosystems
  - Modular horticultural matting at the Downstream Seine plant, diversification of the agricultural uses for sludge and their compost by developing the use of sludge compost for purposes other than agricultural land spreading.
- Fight against global warming
  - Optimisation of energy consumption in the Development and Prospection Division buildings

The execution of the 2010 Action Plan was monitored on a regular basis. The overall progress achieved at the end of 2010 was 80%. We observed a more positive involvement by the divisions and more accurate accounting. A growing number of actions were carried out: 41 in 2008, 55 in 2009 and 66 in 2010. The sustainable development policy is increasingly effective due to the increasing number of actions carried out.

DIRECTIONS AND PROSPECTS

In 2012, there will be a focus on the assessment of the results obtained by the SIAAP with respect to its sustainable development strategy. An assessment grid is being developed that takes into account a set of indicators to make it possible to assess the progress made each year by the SIAAP with respect to the 5 ambitions indicated in its strategy.

As an example, here below is the evolution from 2008 to 2010 of some of the strategic indicators already implemented:

- In terms of safety, the standard monitoring focuses on occupational accidents (frequency rate from 2008 to 2010: 25.1, 24.33, 26.68 and severity rate: 1.78, 0.90, 0.64). We observe that though the frequency rate is fairly stable, the severity rate has decreased significantly.
- In terms of public information indicators, we observe an increase in the number of visits to the **Seine aval *demain*** website: 5452 in 2008, 24,165 in 2009, and 59,640 in 2010.
- In terms of olfactory nuisances, the SIAAP establishes weekly results for three sites. The cumulative number of weeks in mediocre or critical situations has fallen from 62 in 2008, to 41 in 2009 and 20 in 2010. We observe a net decrease in these nuisances.
- As an indicator concerning the fight against global warming, the SIAAP evaluates its carbon footprint each year and the evolution from 2008 to 2010 is as follows (in tCO2e): 54,000, 49,600, 44,400 (not yet consolidated). We note a trend of reduced greenhouse gas emissions.

Other **indicators** are **under consideration** to refine the measuring of effectiveness and to integrate changes to the 2009-2012 National Sustainable Development Strategy. Hence, the measurement of biodiversity could be based on the proportion of invasive exotic species or the diversity of habitats or even the number of hectares under differentiated management. The selected indicator must take into account the availability of data and its relevance.

Summary of the 2010 sustainable development action assessments

Within the framework of continuous improvement, Agenda 21 will soon be presented to other institutions belonging to the Ministry of Ecology's **Sustainable development club for public institutions**, in order to enrich the work carried out and to improve the performance of the public sanitation services in the Ile-de-France region.

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michel.riotte@siaap.fr

MANAGEMENT CONTRACTS A POWERFUL APPROACH FOR THE **MODERNISATION OF WATER SERVICES**

{ Caroline Mairesse[1]

KEY WORDS: Management contract, Public Private Partnership (PPP), SEAAL, Johannesburg Water

Definition and rationale of management contracts

Public private partnerships (PPP) in the water sector keep attracting attention since the 1990's, notably over their suitability for developing countries, and ideological considerations have often taken precedence over the assessment of their performance.

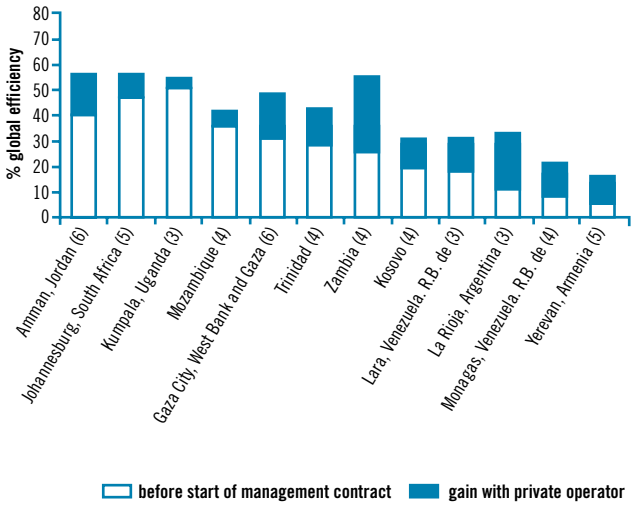
PPPs entail many forms of contractual arrangements with varying levels of risks and responsibilities transferred to the private sector. In comparison with other forms of PPPs, management contracts are characterised by a short time duration (3 to 5 years), a limited transfer of control and responsibility to the private operator, and generally focus on improving the service quality and operational efficiency. Management contracts can be defined as "services which are provided by a publicly owned utility that is managed by a private operator" (Marin, 2009).

According to Philippe Marin from the World Bank, while in the 90's, PPPs were mainly (although wrongly) intended to attract private financing, it turned out that their biggest contribution lies in improving service performance (access, service quality, operational efficiency). The impact of financing is real but indirect, through the efficiency improvements of the utility and its corresponding increasing creditworthiness (Marin, 2009).

Management contracts can constitute privileged arrangements for countries searching for rapid and sustainable modernisation of their water service, as they leverage the expertise of an experienced private operator in order to establish in a few years a viable, corporatized public water utility. In countries where public authorities want to keep a direct control of water utilities, they generate useful pressure and competition for the operators, with emphasize on Key Performance Indicators (KPI) measuring the service improvements. The utility benefits from private sector implementation of innovative and effective tools and approaches, and from a transfer of expertise and know how, which are cornerstone elements of a sustainable service.

The assessment of the performance of a number of management contracts shows a significant improvement of the efficiency of the service following the introduction of the private sector.

Figure 1: Efficiency Gains under 12 Management Contracts: leakage and customer management (*Source: Marin, 2009*)



Note: Efficiency ratio is calculated as the volume of water billed and for which payment has been collected, divided by the volume of water produced and injected into the network. This ratio combines the two indicators – leakage control and bill collection.
Years of operation are indicated in parenthesis.

The following cases illustrate how management contracts in a couple of countries have proved powerful tools to achieve a fast and sustainable modernisation of the water service.

1_ Department of Relations with Institutions, SUEZ ENVIRONNEMENT

The improvement of infrastructure and skills in Algiers

In 2006 only 16 percent of the population of Algiers enjoyed continuous water supply, mainly due to problems of water availability and obsolete infrastructure. The sewerage network was also inadequately maintained and the majority of Algiers' beaches were polluted. In order to improve water supply and sanitation, the Algerian government launched a large reform of the water governance. One aspect of this reform, following the realisation of a vast and sincere diagnosis of the water and wastewater services in Algiers, was the creation in March 2006 of the public operator SEAAL (Société des Eaux et de l'Assainissement d'Alger) and the signature of a 5,5-year management contract with the private company SUEZ ENVIRONNEMENT .

CONTRACT'S OBJECTIVE AND SCOPE

The contract aimed at developing for SEAAL management tools and competencies enabling to reach a sustainable effective World Class service.

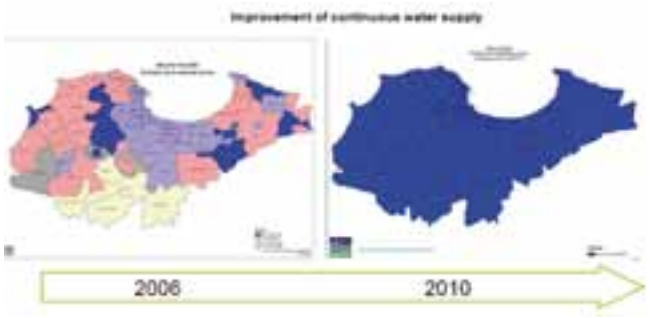
- Reach technical performance corresponding to international Standard on water and wastewater:
  - continuous access to water on a 24H basis,
  - enhanced reliability of wastewater networks and seashore's quality,
  - sustainable and long-term management of water resources,
  - modern and efficient Customer Relation Management.

- Transfer managerial and operational know how from SUEZ ENVIRONNEMENT to Algiers.

- The scope of the service included:
  - Management: the provision of 27 high level experts (30,000 man-days) and specific support missions by experts from SUEZ ENVIRONNEMENT headquarters (2,400 man-days)
  - Implementation of high technology tools: Real time control center, pressure optimization system, groundwater table modelling
  - Know-how transfer, with the development of SUEZ ENVIRONNEMENT methodology, WIKTI, and the set up of a training centre (10 000-15 000 days of training/year)

ACHIEVEMENTS

First of all, continuous water supply in Algiers, has been reached in April 2010, with 100% of the Wilaya served 24hours a day and 7days per week (compared to 16% in 2006). The corresponding water quality is compliant with the World Health Organisation standards.



Secondly, 25 beaches were reopened to Algiers' citizen thanks to the improvement of bathing water quality, due to the mastering of major critical points and risks of the sewerage network.
Finally, the overall customer satisfaction has reached a level of 87% in 2011.

SEAAL experience is now recognized as an international reference in terms of effective quality improvement of a large urban water and wastewater utility. This recognition has been confirmed in 2011 through the "Global Water Award", rewarding SEAAL knowledge transfer as the "water performance initiative of the year", as well as by the renewal of the contract for 5 extra years. This renewal is a strong recognition of SEAAL success on the double challenge of service modernization in record time and mobilisation of employees thanks to an innovative and effective transfer of know-how. This second contract includes an extension to Tipaza Wilaya, a new opportunity to duplicate mastered know-how, to a larger scale.

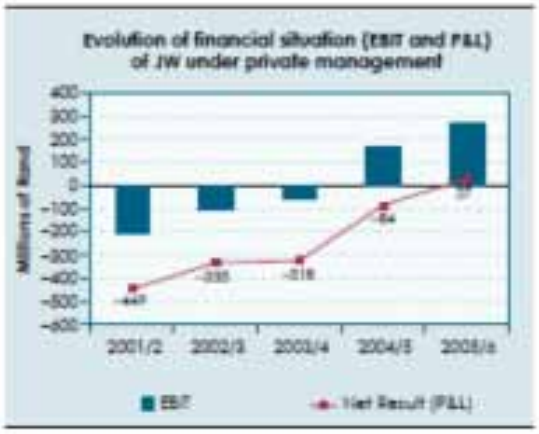
Johannesburg Water: the establishment of a successful corporatized public water utility

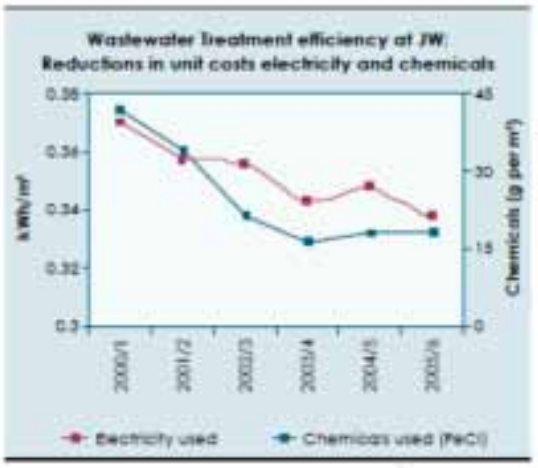
Faced with a severe financial crisis and a situation of fragmentation and related dilution of responsibilities and accountability for water and sanitation services within the municipality, Johannesburg Water (JW) was established in 2000 as a new corporatized public utility responsible for water and sanitation services. A five-year management contract was implemented in April 2001 as part of an overall programme aiming to transform Johannesburg Water into a financially and operationally sustainable and corporatized entity, before passing it over to public management. JOWAM, a consortium led by SUEZ ENVIRONNEMENT , was chosen to assist Johannesburg Water with the management of its water and wastewater services, representing 2700 employees for 3.4 million people served.
A key mission for the operator has been to instil to JW staff a new corporate culture focused on service and efficiency. This new culture emphasized for example the empowerment and accountability of line managers and the promotion of individuals from historically disadvantaged groups (i.e blacks and/or female professionals).

ACHIEVEMENTS

This contract has been widely recognized as a success as JOWAM was able to turn around the general operational and financial performance of the utility, as well as transfer the necessary skills to the water utility management so that it can operate on a sound and sustainable basis at the end of the contract.

Graph 1 and 2: Evolution of financial performance and cost efficiency of wastewater treatment of Johannesburg Water during the management contract (*Source: Marin, Mas, Palmer, 2009*)





The utility went from a negative cash flow in 2001 to positive cash flow in 2004 and posted net profit by the last year in 2006. During the last two years of the contract, an independent national panel ranked Johannesburg Water as the best-performing water utilities among large cities in South Africa.

Lessons learned and Key Success Factors of management contracts

These two cases show that, when properly designed, management contracts can bring significant and sustainable benefits to contracting governments and support public sector reforms. Key factors contributing to their success can be summarized as follows:

- A strong political commitment to the sector reform and the contract in particular,
- An fruitful and trustful relationship between partners,
- a sound, reliable and precise diagnosis of the situation of the service as a prerequisite for designing an efficient and relevant contract,
- a sound choice and design of relevant and clear KPIs, incentive scheme and monitoring procedures,
- the application of sound management principles, and the integration of a change in corporate culture,
- a focus on human resources with an effective knowledge transfer strategy, enabling staff mobilisation and service sustainability.

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ALLIANCE CONTRACTING: NEW GOVERNANCE, IMPROVED PERFORMANCE

Alliance contracting is a co-operative model characterised by openness, trust and an alignment of interests. The contract is based on a co-construction upstream from the project. The main features are:

- Risk-sharing
  - Nearly all obligations are collective, and most risks are shared amongst participants, with a mechanism of painshare / gainshare driven by target performance indicators (usually called Key Performance Indicators - KPIs).

- No blame / No dispute principle
  - The client and the contractor release each other from all liability except in the case of 'wilful default'. Disputes have to be amicably resolved.
  - Rather than spending time and energy on apportioning blame, the better approach is for the parties to work co-operatively to overcome the problem on a cost-effective basis.

- Unanimous principle-based decision-making: Alliance Management board
  - Project development is driven by a co-operative "Alliance Leadership Team" (ALT) made up of representatives of the client and the contractor. The purpose is to deliver the project in accordance with agreed goals and alliance principles. Generally, all decisions must be unanimous.

- An integrated project team selected on the basis of best person for each position
  - An Alliance Management Team (AMT) manages the day to day operation of the Alliance, headed by an Alliance Manager, and reports to the ALT. All persons of the wider project team are appointed on a "Best for Alliance" staffing and some AMT positions can be staffed by the Client.

This type of contracting has its origins in the UK where it was first used in the early 1990's. It has then been developed and refined mainly in Australia and New Zealand and is now widely used in both public and private sectors, mainly for infrastructure projects (Ross, 2009). In Adelaide, the fifth-largest Australian city, Alliance contracting is being implemented on a large scale to the water and wastewater sector.

Early 2011, the Government of the State of South Australia has awarded SUEZ ENVIRONNEMENT and its subsidiary, Degrémont, in partnership with Transfield Services, a contract, generating a global revenue of 840 million euros, to supply water and waste water services to 1.1 million inhabitants in the city of Adelaide and its surrounding area.

The contract, which will operate as an alliance contract between SA Water (the South Australian Government owned water utility), and Allwater Consortium, will last for an initial term of ten years. It includes operating and maintaining six water treatment plants, six purification plants, the 16,000-km water network, as well as recycled water schemes and minor capital works.

SA Water's Head of Operations, Rob Dowling says *"The new alliance model will ensure SA Water and Allwater work closely together, collaborating on strategy and sharing skills and expertise providing a more flexible approach to water management across metropolitan Adelaide."*

In *Alliance contracting*, the client is at the core of the contract, and both parties strive for a common vision and objective. It fosters good governance and ensures progress of key operational performance indicators as well as a good budgetary control.

This type of Public Private Partnership introduces significant changes of culture:

- Be more focused on responsibilities
- Develop collaborative working relationship
- Create a culture focused on achievement to improve business performances

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FINANCIAL AID TO BOOST THE PERFORMANCE OF SANITATION SERVICES: **THE CASE OF WASTE WATER TREATMENT BONUSES**

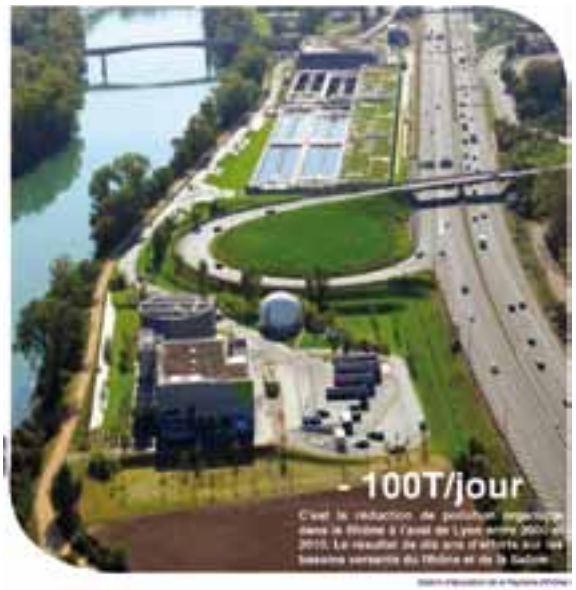
Jean-François Curci[1]

KEY WORDS: premium purification, services performance, balancing incentive, output based-aid

General context

The notion of waste water treatment bonuses is relatively old but was revised through the French Law on Water and Aquatic Environments of 31 December 2006. This law introduces several important provisions to water agency action programmes: expenditure ceiling, parliamentary guidelines on rates, etc.

With reference to environmental laws, and as part of its multi-annual action programme, the water agency today provides financial assistance in the form of results-based bonuses or subsidies in return for actions or work performed that contribute to the balanced management of water resources and aquatic environments. The agency therefore provides its support either *via* an investment subsidy or financial aid based on operation (waste water treatment bonus).



Within this framework, when a system is put in place to prevent the degradation of water quality, a bonus is paid out to the public or private facility owner or its representative. The bonus calculation is based on the quantity of household pollution that is prevented from entering or eliminated from the natural environment. The bonus may be modulated to take into account compliance with specifications imposed by a water police department.

During the 9th programme of the Rhône Mediterranean and Corsica agency, the waste water bonus system was gradually adapted to boost the incentive to achieve better sanitation system waste water treatment performance.

The average annual budget allocated to waste water treatment bonuses for the 2007-2011 period amounts to €90m. Any sanitation system is eligible, totalling 3,500 payments a year. However, as the waste water treatment bonus is mainly proportional to the pollution eliminated, 80% of this budget covers roughly 395 sanitation systems, constituting a major challenge for this policy. For instance, the bonuses for the Marseilles treatment plant or the two major plants in Lyons amount to around €9m.

Principles underlying the waste water treatment bonus and service performance

The waste water treatment bonus calculation method is relatively simple being based on the quantity of pollution eliminated by the waste water treatment system. This is modulated by a certain number of parameters reflecting service performance on other parameters.

Bonus = base x rate x conformance coefficients

AID BASED ON ELIMINATED POLLUTION

The bonus calculation base is set according to an evaluation of eliminated household pollution. It includes:

1_ Agence de l'Eau Rhône Méditerranée et Corse

- an estimation of household pollution, modulated by a collection efficiency coefficient,
- an estimation of external inflows,
- weighting of these components in relation to waste water treatment plant efficiency.

The calculation is performed for each pollution parameter (SS, COD, BOD_5, NR, NO, P, METOX, ACUTE TOXICITY, AOX). Based on the financial rate associated with each parameter, greater aid can be allocated for parameters deemed to have a higher impact on basin environments. These financial rates vary according to zone.

The agency's services calculate efficiency using the waste water treatment system self-monitoring data and it therefore includes the effective performance observed. These data are also used by the water police services to ensure regulatory compliance.
Thus, with the bonus being proportional to the waste water treatment plant efficiency, this system encourages better operating performance.

The surveys performed by the agency on operators and facility owners show a definite correlation between waste water treatment plant efficiency and waste water treatment bonuses.

The calculation of the collection performance is still not satisfactory and based too heavily on set figures or statements.
To minimise this bias, the 10th programme is likely to adopt a gross pollution calculation approach based on plant inflow data alone. The bonus will therefore be proportional to the gross pollution received and observed (and not calculated theoretically) and matched with the operating loads for the elimination of pollution. This will also act as an incentive to maximise inflow to the plant and hence improve collection performance.

WEIGHTING METHODS TO ENCOURAGE HIGHER OPERATING PERFORMANCE

The eliminated pollution calculation was unable to incorporate other waste water treatment system operation performance parameters: behaviour during rainy periods, network self-monitoring, waste water sludge management, etc.

This is why weighting coefficients have gradually been introduced. These directly impact the waste water treatment bonus and are consistent with systems providing investment aid set up by the Agency.

Regulatory compliance according to the Urban Waste Water Treatment Directive (UWWTD)

Compliance with the UWWTD reflects two sanitation system performance factors: its performance in terms of general operation (performance compliance or non-compliance), which notably includes management during rainy periods, but also the ability of the utility, thanks to its equipment conformance, to have planned ahead for changes to its treatment facilities (adaptation to urban development notably).

Weighting coefficients have therefore been introduced to the bonus calculation in order to introduce sanctions in case of non-compliance with the UWWTD:

- coefficient of 0 for equipment non-compliance
- coefficient of 0.8 for performance non-compliance. In the case of several consecutive years of performance non-compliance, this coefficient is reduced to 0 after three years.

The withdrawal of the bonus for non-compliance of equipment echoes the substantial challenges underlying European litigation on delays in bringing waste water treatment plants in line with the UWWTD.
It also suggests that such a situation of non-compliance appears after several years of performance non-compliance and that, over this lapse of time, the authority should have produced a technical project to improve its facilities or, in the case of chronic facility saturation, should have planned to extend the sanitation system.

First applied in 2009 to waste water treatment plants subject to the 1998-2000 timescale, this system was only extended in 2010 to 2005 deadlines:

- In 2009, 54 bonuses were withdrawn for authorities subject to the 1998 and 2000 deadlines, representing roughly €12m.
- In 2010, authorities subject to the 2005 deadline were taken into account hence increasing the number of bonuses withdrawn or reduced: 150 bonuses, out of which 107

concerned the 2005 deadline and 43 the 1998 and 2000 deadlines, also representing roughly €12m.

A communication campaign about this system was launched in 2007 and was quickly taken on board by the authorities concerned as they strove to speed up the timeframe for aligning their facilities with standards. The waste water treatment bonus was only reintroduced once the facilities were working again and compliant with standards. The bonus thus constituted a strong incentive to upgrade facilities as fast as possible as authorities concerned were pressured to manage the project with the highest level of performance.
Many authorities therefore included the loss of bonuses into their specifications, either *via* high penalty clauses (Greater Lyons and Chambery), or by transferring the bonus to the construction company as part of a concession or as part of design, development and operation contracts over a three-year period.

The degressive performance non-compliance coefficient is recent: the 80% mark was decided when the programme was revised in 2010 and the degressive scale for the following years was decided on as part of the 10th programme.
This reflects the new challenges of the SDAGE (the French Water Development and Management Master Plan):

- To maintain the performance of services in the long term by quickly signalling "surcharges" for regulatory downgrades linked to foreseeable capacity saturations,
- To meet the challenge of rainy period management: when rainy periods are not managed properly, this leads to downgraded situations on certain days, which are not taken into account in the notion of self-monitored efficiency but which are sanctioned by regulatory monitoring.

With these provisions being recent, there is still little hindsight as to how effectively incentive they are. The system must be designed to prevent a situation of performance non-compliance from lasting too long, and even prevent such a situation from arising. This nevertheless requires authorities to buy into the principle fully and hence calls for an important education and communication phase. This phase is currently underway.

Existence of a validated self-monitoring system

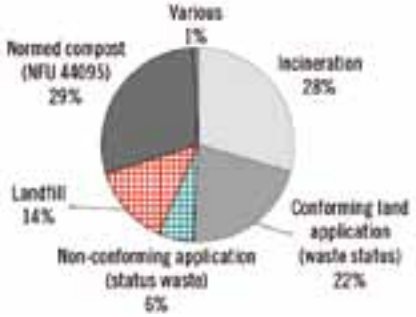
SELF-MONITORING OF TREATMENT WORKS	SELF-MONITORING OF COLLECTION WORKS	COEFFICIENTS 2011	2012
Validated	Validated	1.00	1.00
Validated	Not validated	0.96	0.94
Validated	Absent	0.80	0.70
Not validated	Validated	0.84	0.86
Not validated	Not validated	0.80	0.80
Not validated	Absent	0.64	0.56
Absent	Validated	0	0
Absent	Not validated	0	0
Absent	Absent	0	0

To be able to judge the operation of a sanitation system, the self-monitoring part must be validated. Currently, 100% of plants with a basin of over 2,000 PE are fitted with self-monitoring equipment. This is not the case of sanitation networks when in fact their monitoring is essential to be able to judge the impact of the system during rainy periods. To date, only 50% of over 10,000 PE waste water treatment systems are fitted with such equipment.

To encourage the setting up of validated systems and network self-monitoring, the Agency has devised a scheme that combines investment aid (30%) with penalties on operating aid (waste water treatment bonuses) at degressive rates.
The aim is to encourage sanitation services to set up suitable and high-performing self-monitoring systems and indeed this has become a trend over the last three years.

An incentive for the proper management of waste water sludge

Becoming of sludge purification (data 2008 RMC Agency, sludge production: 275,000 t of dry matter)



The treatment of waste water plant sludge is the last link in the waste water treatment chain.

Proper waste water treatment in a plant requires regulatory and sustainable sludge evacuation (regular removal of sludge), which also has an impact on discharge quality. Regulated sludge evacuation also protects the natural environment by making sure that the sludge is managed properly.

Although 80% of basin sludge tonnage is dealt with according to regulations, 14% is transferred to dumps (this figure also includes composted sludge used for revegetation), a method to be forbidden by 2015, and 6% is used for spreading often using non-conforming methods (excessive doses, non-compliance with land application scheme, etc.). In all, roughly 650 authorities in the Rhône, Mediterranean and Corsican basin, most of which are very small, have yet to find a conforming and lasting sludge evacuation solution for their waste water treatment plants.

Raw sludge recycling for agricultural purposes is the most ecological and least costly method. However, this operation is still a delicate one and requires irreproachable land application schemes. The same applies to other organic management methods such as composting (product or waste).

This is why waste water treatment bonuses are modulated according to the regulatory notice associated with land application schemes. They also depend on the monitoring of land applications by experts and on water police services, with penalties ranging from 50% to 100% according to the irregularities observed.
The use of dumping as the main method (rather than a back-up method for nonconforming sludge or recycling through revegetation) has led to the bonus being withdrawn since 2011.

To render the production of NFU 44-095 compost reliable and encourage improvements in the content of sludge sent to composting centres by authorities, the Agency has introduced a 10% bonus on top of the waste water treatment bonus for authorities whose sludge is converted into NFU 44-095 sludge, on condition that specific ETM thresholds are complied with. This extra bonus is associated with a composting centre approval policy in order to reinforce the traceability of sludge and make it possible for the Agency to audit these centres.

These points are currently being communicated to local authorities with the aim of encouraging them to change their methods, make their land application practices more reliable or strengthen their sewage connection agreement policy in order to limit the content of metals in the effluents to be treated.

Conclusion

Waste water treatment bonuses are an example of operational aid whose very calculation basis is linked to service performance. This system has been backed up with the notion of bonuses and penalties in areas where the calculation of facility efficiency is unable to reflect service performance: investment planning, metrology, management of by-products, etc.

Basing incentives on such systems can only work if they are known to and understood by sanitation services. Although these systems seem to be advantageous for large facilities, a study is underway to check the performance incentive for smaller facilities and the possible adaptations necessary.

2

Improvement of the in situ performance

2.1 Improving the performance by the coordination arrangements between service providers and authorities

IMPROVING SANITATION NETWORKS WITH MONTHLY ACTIVITY AND PERFORMANCE INDICATORS: **THE EXPERIENCE OF THE HAUTS-DE-SEINE SANITATION SERVICE**

Anne Guillon[1]
Bernadette Pister[1]
Hubert Dupont[2]
& Anne-Cécile Michaud[2]

KEY WORDS: performance monitoring, steering, performance objective, public service delegation

Introduction and context

The Hauts-de-Seine General Council (CG92), is the organizing and main contracting authority of a sanitation infrastructure consisting of over 600 km of combined and separate sewer systems (most of which can be visited), and many wastewater raising stations.
The organizing authority entrusted SEVESC, a subsidiary of Lyonnaise des Eaux and private operator, with the operation of sanitation services. It has two primary missions:

- The transfer of wastewater of about 1.5 million inhabitants of the Hauts-de-Seine department, that is collected by the municipal, communal and departmental wastewater networks and sent to the treatment plants of the SIAAP (Syndicat Interdépartemental pour l'Assainissement de l'Agglomération Parisienne), which is in charge of treating the effluents before they are discharged into the environment.

- The transfer of storm water in the Hauts-de-Seine when the runoff can neither be infiltrated nor reused. During periods of rainfall, the objective of sanitation services is to prevent network overflows and limit the dispersion of pollutants into the environment.

Origin and evolution of the project

In 2003, a number of specific indicators were developed by the Water Directorate of the General Council and the SEVESC in conjunction with efforts to comply with the ISO 14001 standard for environmental management systems.
In 2006, the implementation of a scheme for establishing and analyzing monthly indicators for all the activities of wastewater services was jointly initiated by the organizing authority and the operator. These indicators were developed in light of both parties' shared concern for objectivity and improvement.
The objective was twofold:

- To enable the organizing authority better continuous monitoring and control of the missions entrusted to the delegated operator,

- To provide the operator with improved oversight of its activities.

The analysis of the indicators, which are grouped from the beginning in the monthly activity report, has gradually played an increasingly important role in the relations between organizing authority and operator. In 2008 and 2009, they were useful in negotiating service contract amendments and they also helped the establishment of performance targets.

1_ Hauts-de-Seine General Council, Water Direction, 61 rue Salvador Allende 92751 Nanterre cedex - France (aguillon@cg92.fr, bpister@cg92.fr)
2_ SEVESC, 15-19 quai Gallieni 92150 Suresnes - France (hubert.dupont@sevesc.net, anne-cecile.michaud@sevesc.net)

Preparation of a monthly activity report

DESCRIPTION

Every month, the SEVESC calculates 70 indicators and prepares a "monthly activity and self-monitoring report of the delegated operator" in which the following information is provided in the form of graphics, tables and maps:

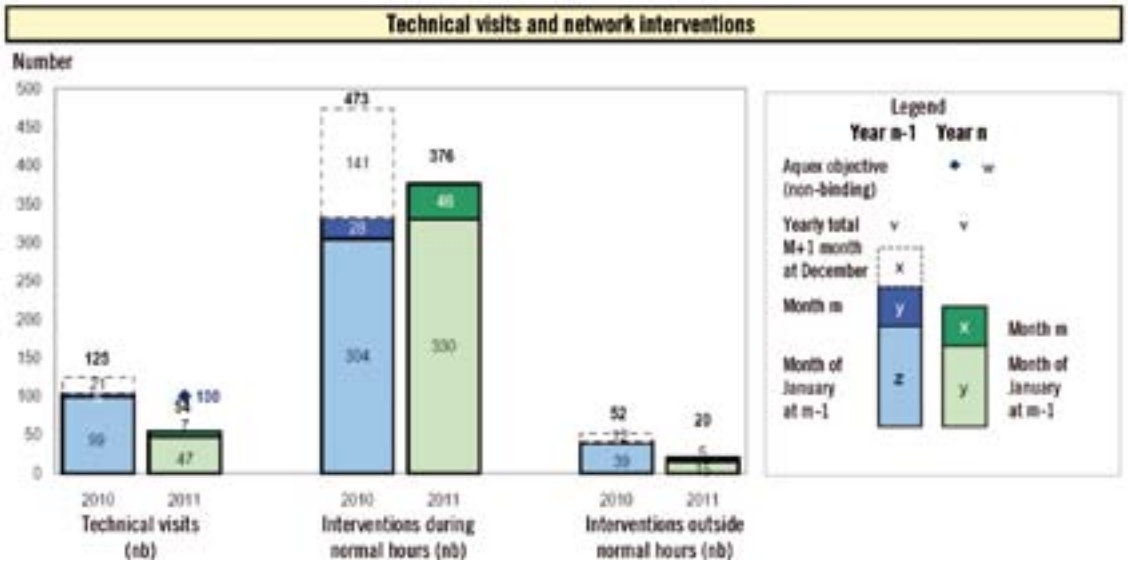
- Monthly indicators with an indication of changes since the beginning of the current year;
- A historical perspective with respect to the previous year (or the two previous years);
- Volumes corresponding to contractual targets or set targets for the sanitation department by the Seine-Normandie Water Board (Agence de l'Eau Seine-Normandie).

Most of the indicators were provided with a statement detailing the analytical elements of the figures.

The high number of indicators (70), is an indication of the scope of the missions and the size of the department (represented by context, activity, and performance indicators), and the desire to meet two goals: control of the operator and oversight of the activity.

The pertinence of the monitored indicators is reviewed and questioned at regular intervals. For example, in 2011, two indicators were dropped because the monthly monitoring frequency was deemed unnecessary (once a year being sufficient, an analysis of the indicators will be provided in the annual report), and three new indicators were added.

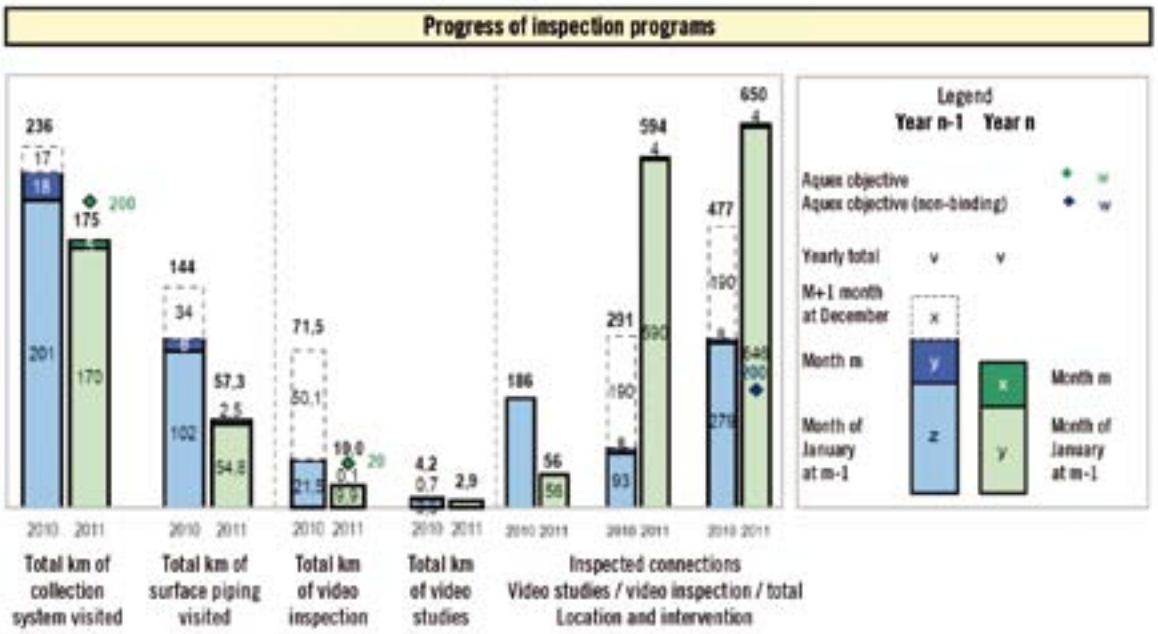
Examples of monthly monitored indicators



The total volume of water released by measure-equipped stormwater overflows (72 points on 99 outlets) was 783 m³ for the month with a polluted load discharge estimated at:

- 13 T of TSS
- 16 T of COD

Estimates based on average concentrations determined during the study "Contrôle et suivi des déversements du réseau départemental des Hauts-de-Seine" CG92/Safège 2000 to 2002.



CONTENT

The indicators pertain to all the missions entrusted to the SEVESC. They can be broken down into three categories:

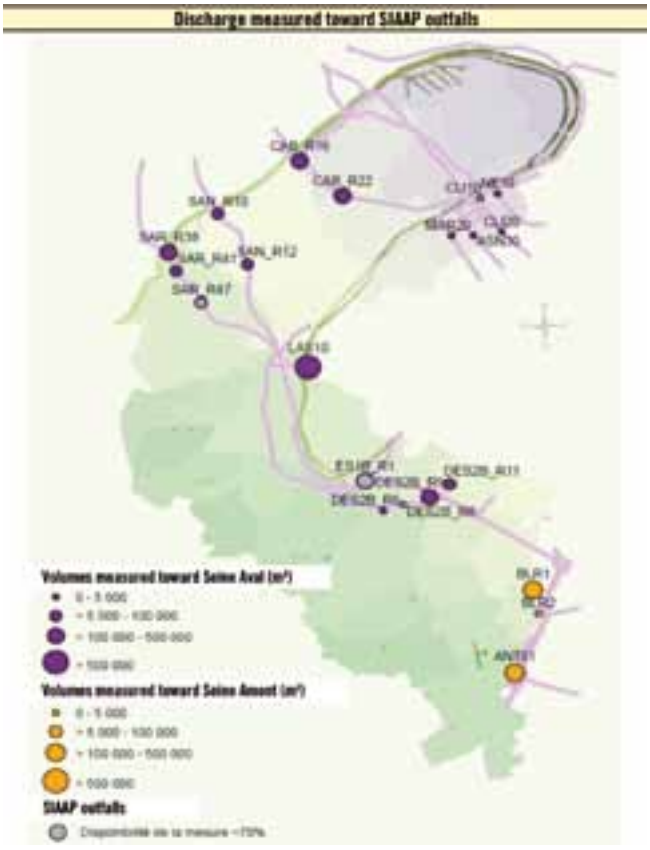
- **Context indicators:** rainfall by catchment basin, level of Seine River, etc.
- **Activity indicators:** progress of inspection programs (walking tours of accessible structures, video inspections of pipes), cleaning, compliance checks (including specific programs for separate sewer sectors and storm water drainage structures in each unit), monitoring programs of non-household discharge, maintenance of structures, number and reasons for intervention, location and progress report of work sites, etc.
- **The performance indicators:** volumes discharged into the network overflow points, availability (mean time between failures) of flow control structures and pumping stations, number and reasons for written complaints and intervention requests, results of client satisfaction questionnaires, monitoring of external projects, etc.

A cross analysis of the data of certain indicators, for example the volumes discharged into the Seine, rainfall measurements, the equipment availability, and the specific configurations of the network, are helpful in understanding the interactions and better comprehend the impact management tools can have on the execution of the service mandate.

INDICATOR CALCULATION METHODS

The SEVESC proposes the calculation methods used to elaborate the indicators. They are subsequently the subject of discussion and exchange with the CG92 water directorate before being validated by both parties. They are then explained and consolidated in a “users’ manual” that is regularly updated.

Most of the indicators are easily calculated from the materials and



database created by the SEVESC. For example, every request for intervention is registered on a separate form that is completed by a team out in the field (time of call, time of intervention, type of problem, means deployed to solve problem, etc.) then the information is entered into a database. The calculation of the “number and reason for intervention, during working hours or on call” indicator is easily done by filling in different fields in a query of the data base.

However, calculation rules and methods must be established for certain indicators that are difficult to evaluate. The indicator of the availability rate of regulated gates (automated combined

sewer overflows) have, for example, been the object of several tests in a bid to interpret the simplest yet best operating mode for these structures, which play a strategic role in the management of sewer systems. The method that was adopted only takes into account the availability of the automated gate when needed, in other words from the beginning of the rainfall until the water has been completely reabsorbed – or between one and four hours after the rainfall, depending on the catchment basin.

Analysis and use of the monthly activity report

The indicators of month *m* are calculated from a database or from the results of calculation modules for the month *m + 1* by SEVESC's different activity leaders. They are analyzed and specific comments are added. A technician completes the consolidation and formatting. The average amount of time spent each month on completing the monthly report (indicators and analysis) is estimated to be three engineering days and four supervisor/technician days.

A provisional version is provided to the CG92 Water Board and commented on by SEVESC during the monthly executive meeting of month *m + 1*, which is generally held between the 20th and the 30th of each month. The Water Board of the General Council then addressed any comments or questions to the SEVESC during the monthly technical meeting of month *m + 2*. A final version is drafted once all the comments have been taken into account.

Activity of department	Calculation of indicators and drafting of provisional version of the monthly activity report	The provisional monthly activity report is commented and checked
	Report is submitted during the executive meeting	The final version of the monthly activity report is drafted
Month *m*	Month *m + 1*	Month *m + 2*

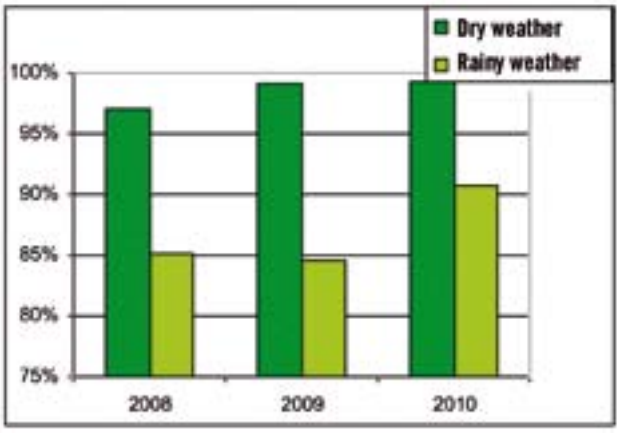
The provisional and final versions of the monthly reports can also be consulted on an internet exchange site that is shared by the Water Directorate and SEVESC, and posted on bulletin boards for all SEVESC personnel.

The creation of monthly indicators and analyses has also helped reduce the time devoted to the completion of the annual reports. These reports include: the operator's annual report, the county's price and service quality report, the AQUEX report that is sent to the Water Agency, self-monitoring report, etc.

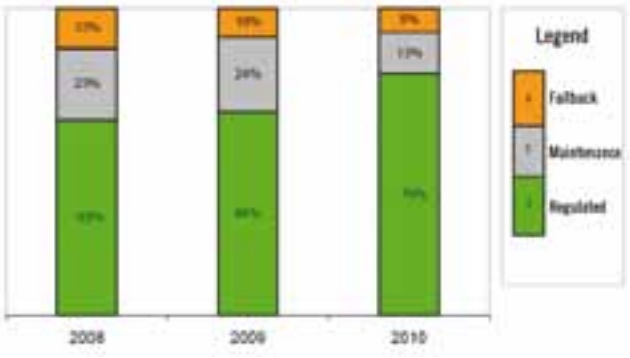
Gradually, the performance indicators and their analysis have become a central management tool for:

- The general council water directorate, which is regularly updated with reliable information and analysis to better assess the performance of the operator beyond that which is legally or contractually required. The monthly activity report is thus a tool that is perfectly consistent with the concept of integrated and thorough oversight by the local authority, as well as a desire for operator transparency.
- SEVESC: its internal organization is reinforced through the establishment of clear and monthly monitored performance goals which can be broken down into collective or individual goals. As such, the indicators represent motivational tools for improving performance. Furthermore, a cross analysis of the indicators makes it possible to reinforce measures for continuous operational improvements. For example, a correlation between pumping station downtimes and interventions subsequent to equipment failures revealed recurrent problems with certain wastewater screens. Rehabilitation work to be conducted by the operator was reassessed so that the screens most prone to failure were given priority, and alarms were added to help anticipate failure. This type of action contributed to the increased availability of pumping stations in both dry and wet periods over the last three years:

Availability of the pumping stations



Availability of the regulated gates



The shared monitoring of indicators has thus led to significant improvements and a more rigorous monitoring of performance over time: the availability of the regulated gates went from 63% in 2008 to 79% in 2010, and the SEVESC was able to reduce the rate of accidental spillage during dry periods to almost 0, in other

words, about 5,000 m^3 of wastewater spilled out of a total of 90 million m^3 of wastewater conveyed in 2010.

Conclusion

The elaboration of a monthly activity report complete with 70 indicators that are commented and analyzed by the SEVESC and the General Council's Water Directorate requires the participation and contribution of many individuals. Consistently producing a quality report in a tight time schedule poses a real challenge month in and month out.

However, the rewards make the effort worthwhile. The monthly report is a tool for sharing information that promotes transparency of the operator's management; it has become a centerpiece in the relations between the organizing authority and the operator, and an indispensable element for both in their efforts to constantly improve county wastewater and sanitation services.

INTEGRATING PERFORMANCE TARGETS IN CONTRACT BETWEEN LOCAL GOVERNMENT AND ITS CONTRACTOR

Agathe Cohen[1]
Jacques Cavard[1]
& Didier Carron[2]

KEY WORDS: performance indicator, operator's fee, Île-de-France

The *Syndicat des Eaux d'Ile-de-France (SEDIF)*, created in 1923, manages the production and distribution of drinking water for 142 municipalities in the Parisian region, or approximately 800,000 m³ of water daily. This makes SEDIF the largest public water service in France, and among the largest in Europe.
After a four-year process, a new reworked public service delegation contract came into effect on the 1st of January 2011.

Service quality has been one of the SEDIF's core concerns for several years, particularly with regard to all aspects of client relations and water quality. Consequently, the SEDIF designed and developed a management system to assess service quality in 2002 with the aim of developing consumer complaint-response capabilities and a continual improvement process.

This system, characterized by the service quality cycle outlined in the AFNOR NF P15-900-4 standard (guidelines for the management of drinking water system), is intended to deploy a set of management tools for measuring:

- The quality of service provided through 135 contractual performance indicators and 13 regulatory indicators[3]
- The expected standard of quality service, based on user and municipality satisfaction obtained through the creation of a quality monitoring service. Telephone surveys conducted by an independent organization will be carried out on a continuous basis to gather reactions from various consumers (single households, building managers, towns, etc.). This quality observatory service will monitor all service activities of both SEDIF and appointed operators.

This dual system has raised awareness of the subjective nature of surveys and of the need to respect a certain level of neutrality. The system of indicators, based on verifiable physical data, makes it possible for SEDIF to better "measure user appreciation in terms of service satisfaction and whether needs have been met."[4]

The introduction of a new public service delegation contract provided an opportunity to reinforce, enrich, and structure this process, and to promote compliance with the ISO 24 512 standard.

Principle of operator's fee in the new contract

The contractor's remuneration paid by SEDIF is based on a set of technical and financial performance targets.

But before developing a system of indicators that would enable measurements of the technical performance of the delegate, a remuneration protocol must established that specifies whether, or to what extent, compensation will depend on accomplishing the missions entrusted to the operator, and whether or not the management goals that were stipulated in the contract were achieved.

This point was the subject of many long discussions, as the incentive scheme must address various issues, including:

1_ SEDIF
2_ Pöyry SAS
3_ Annual report of the SEDIF, 2010
4_ Groupe Moniteur- DSP - November 2007

- Ensuring the operator shares in operational risks
- Encouraging the delegate to improve productivity and service performance
- Enabling the operator to make an adequately attractive profit while eliminating potential opportunity costs
- Ensuring legibility
- Limiting exposure of the SEDIF to unjustified risks

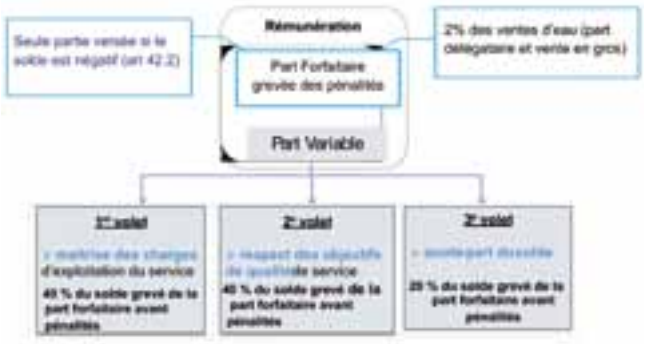
It was thus decided to base the delegate's overall compensation for a given year on both a fixed share and a share that would vary in accordance to the stipulations detailed below in order to ensure coherence with Cour des Comptes (French court of auditors) recommendations: contractual obligations must focus more on the goals to be reached than on the means that are deployed; qualitative targets or demands, based on objective criteria, must be enforceable with sanctions when not met (which supposes the implementation of performance verifications and a definition of relevant indicators); the implementation of an incentive scheme must prove beneficial to the contractor if its management proves to be highly capable or shows improvement – in other words, the link between performance and remuneration must be strong.[5]

- A fixed share equal to 2% of yearly retail sales to consumers and wholesale water revenues are to be attributed to the delegate. This share will be paid out regardless of the balance of the operating income
- An variable share of the contractor's remuneration is to be in the form of an incentive scheme that is assessed from the operating income[6] minus the fixed share, and calculated in three parts:

• A 40% incentive payment that is based on meeting service quality targets, as well as technical performance levels (technical management, service to users, sustainable development)
  • A 60% incentive payment assessed on the basis of financial performance and made up of:
  • A 20% share of the operating account balance minus the fixed share
    > A 40% incentive payment that will depend on the operator's control of operating costs
    > A system of penalties will be used to sanction any breaches of contract or performance shortfalls and subtracted from the fixed share, thus either reducing the share or even causing its forfeit.

It should be noted that no incentive payment is made in the case of a negative fixed share payment.
Finally, the ceiling of the contractor's remuneration is set at 9% of all water sales.

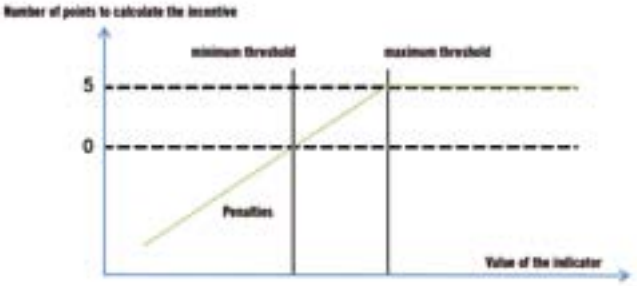
Figure 1: diagram of contractor's remuneration



The new contract's performance indicators

THE TECHNICAL PERFORMANCE INDICATORS

A technical performance assessment, for which the operator is either paid or penalized as an incentive to maintain a very high level of service quality, is conducted on a set of 136 indicators broken down into four categories : user services (17 indicators), technical management (43 indicators), sustainable development (24 indicators), and water quality (52 indicators).
In general, an objective value is assigned to each indicator in such a way that when it is reached, the highest incentive is used when calculating the operator's compensation. A minimal threshold is also set, below which the contractor is assessed a penalty.
Between the two values, the amount of the incentive will vary progressively, depending on the value of the indicator, according to the graph below. The linear increase is intended to encourage the operator to remain as close as possible to the maximum objective value.



Each of the indicators is weighted; the impact on the remuneration varies from one indicator to another.

However, some indicators are only subject to penalties. These are mostly indicators for which there are regulatory thresholds (indicators related to the quality of produced and distributed

5_ Special report of the Cour des Comptes, *La gestion des services publics d'eau et d'assainissement,* December 2003

6_ Public service delegation contract for managing a drinking water distribution service - article 42 "Le solde d'exploitation annuel se définit comme la différence annuelle entre les recettes et les charges de la société dédiée, hors éléments imputés au compte des activités complémentaires et/ou accessoires et au compte d'observation"

water, discharge indicators, etc.). The SEDIF considers that it is normal that the operator meet these obligations, and consequently, there should be no reward for meeting these standards. However, the failure to meet these objectives must be sanctioned.

Table I: A few indicators listed in annex 6 of the contract pertaining to technical management indicators

Parameter	Comment / Definition	Frequency of the indicator value delivery	Objective requested for the operator	Indicator weight in the incentive part	Threshold for penalties	Penalty applied annually
Network performance	see definition in Annex 6	annual	90 %	25	88 %	20,000 € per 0.1% missing
Linear index of network repairs	see definition in Annex 6	annual	0.32 Nb/km	10	> 0.42 Nb/km	20,000 € for every 0.1 Nb/km
Linear index of repairing connections	see definition in Annex 6	annual	1.50	10	> 2.00	20,000 € per full 0.1 Nb/km
Park counter performance	see definition in Annex 6	annual	97 %	10	96 %	20,000 € per full 0.1 Nb/km
Disinfection of pipes	Number of pipe disinfection pipe to renew (after negative control (self-monitoring or not))	annual	< 5	5	> 10	10,000 € per disinfection to renew beyond 10
Renewal of tank cleaning	Positive controls after performing the cleaning operation according to quality assurance	annual	No renewal cleaning	5	2 replacement cleaning	5,000 € per renewed cleaning beyond 2
...	...	...	...	...	...	...
			Total weight	150		

It is then important to ensure the reliability of the indicator values provided by the delegate. A certification of the performance indicator production process must be obtained and maintained by an independent organization at a maximum level, or at a reasonable level of assurance, that is established by contract in the form of a separate commitment that is subject to a steep penalty (€50,000 for failure to obtain all or any part of the certification).

Furthermore, the SEDIF has been equipped with the means of recalculating the value of indicators by means of its permanent access to the delegate's information system.

The financial performance indicators

Financial performance is measured through the contractor's economic result (the share of operating balance) and through the restraint of current expenditures (which provides an incentive on limiting operating expenses). The latter is appreciated by comparing the charges of the year with the reference charges, which are the forecasted costs of the 1st year of the contract (in this case 2011) that are updated each year to take into account both inflation and eventual changes in volumes – a portion of the charges being directly proportional to the produced volumes.

Incentive payments are shared between the delegate and the SEDIF as a function of the value of coefficient k_n, given that if kn >1.0125, no incentive on the control of operating expenses will be paid to the contractor, and that conversely, if kn <0.9875 the delegate will receive the entire 40% share of the incentive scheme. Between these two values, the delegate's share of the incentive is degressive and beneficial to the SEDIF.

Coefficient k_n reflects a measurement of the delegate's productivity gains for each year and is calculated with the following formula:

$$k_n = \frac{C_n}{(1 - p_n) \times C_{ref\,n}}$$

p_n being the productivity gain for year (n)
C_n being the actual observed charges in the operating account for year n
C_{refn} being the fixed and variable reference charges for year n calculated according to the following formula:

$$C_{refn} = (CR_{CF\,ref} \times CF_{ref\,0}) + (CR_{CV\,ref} \times CV_{ref\,0} \times \frac{V_n}{V_0})$$

CF_{ref0} being the fixed reference charges of the operating account as defined in annex 13 of the contract

CV_{ref0} being the variable reference charges of the operating account as defined in annex 13 of the contract

V_n being the volume billed for year n

V_0 being the reference volume for the period of delegation

CR_{CFref} being the revision coefficient of the fixed reference charges (CF_{ref0}) as defined in annex 13 of the contract

CR_{CVref} being the revision coefficient of the variable reference charges (CV_{ref0}) as defined in annex 13 of the contract

Conclusion

The delegate compensation scheme as has been described should allow for the creation of a complete scoreboard intended to better control and steer the technical and financial performance of operations, and to compensate for good performance in a virtuous manner without charging users extra. Indeed, the difference between the total maximum incentive (upon which the actual price of water paid by the user is calculated) and the actual incentive paid, is to be returned to the SEDIF, thus resulting in cheaper service charges that, in the end, benefits users. Of course, as the contract only entered into force on January 1st 2011, close attention should be paid to eventual changes in the incentive scheme so as to measure their various impacts and better protect against any adverse effects, should they arise.

CONTRACTUAL FORMS OF **PERFORMANCE-BASED COMPENSATION**

{ Sybille de la Grand'Rive[1]

KEY WORDS: contract, performance indicator, objective, cross-compliance

The genesis of performance-based compensation in contracts

Water and sanitation service performance indicators, the subject of many studies and publications (ENGREF, IWA, IGD, FP2E, FNCCR, etc.) over the last 15 years, now constitute a set of complete, coherent, recognized benchmarks that have been legitimized by the 2006 Water Law and the subsequent implementing decree of May 2007.

The systematization of the measurement of the indicators, even before they were made compulsory, was driven by regulatory compliance (self-monitoring, quality criteria of distributed water, etc.) or descriptive appraisal of the service.

The establishment of a common set of references and the creation of a single database (SISPEA) in 2009, lent credibility to the entire system and signaled a major step in the evolution to the era of benchmarks, scoreboards, oversight, targets to be reached, and the assessment, in light of these targets, of the overall performance of these services.

It was only natural that this notion find its way into the contracts, whether they are public ("contractual targets" of the municipality of Nantes) or private, initially through the diversification of penalties, then through the introduction of incentives (bonus/malus), or through a return to management modes like the public service model (régie intéressée). The notion has contributed to the dialogue with the delegating authority and external communications of the services.

The incentive to do a good job, or more precisely to "have" a good job done by the operator, means the contracts had to evolve from one that stipulated the means (control of the delegate's activities by the delegating authority) followed up by a quantitative assessment, to one that was based on quantitative results that were motivated by "economic rewards".

This "performance-based deal" that is currently being incorporated into a growing number of contracts focuses on a long-term progress-oriented approach; the initial status is known, the time and means to reach a more or less ambitious performance level are estimated, the operator is encouraged to reach the targets with the dual perspective of visible and recoverable benefits for both municipality and users and economic incentives for the operator (return on investments of the means deployed, the resulting margin level, etc.).

It should be noted that the management mode does not limit the use of such mechanisms: performance-based compensation is intrinsically linked to the public service model or to partnership contracts; in the delegation of public services, it fits perfectly well with the notion of "risk" that the delegate must assume.

Practicalities in introducing performance clauses in public service delegation contracts

Beyond declarations of intent or publicized statements, the performance targets in a PSD are based, at the lower end, on an objective assessment of the initial status (strengths, weaknesses), and at the upper end, on a definition and quantification of the quantifiable aims and the amount of the associated compensation. This supposes a concerted diagnosis of the service, a prior assessment of the capacity for progress, and the search for a reasonably optimal level of performance between the room to maneuver economically and the costs of performance.

The tender documents drawn up by the contracting authority will be the first document to be formalized in this process. This includes:

- An explicit declaration of intent included in the "purpose of the tender", that clearly identifies the aim as a progress-oriented public service management approach with targeted levels of performance in specific areas (core business,

1_ Lyonnaise des Eaux

resource management, environmental protections, clientele, social aspects, etc.)

- Tender documents that detail all the elements including technical or planning studies (Agendas 21, SCOT, SDAGE, etc.) essential to the drafting of an ambitious tender by the candidates
- Tender adjudication criteria that describe/weigh, if applicable, levels of importance associated to the system of indicators used to illustrate performance
- The possibility given to candidates to submit variations that would go much further in responding to the ambitions of the community

The main part of the contract would include:

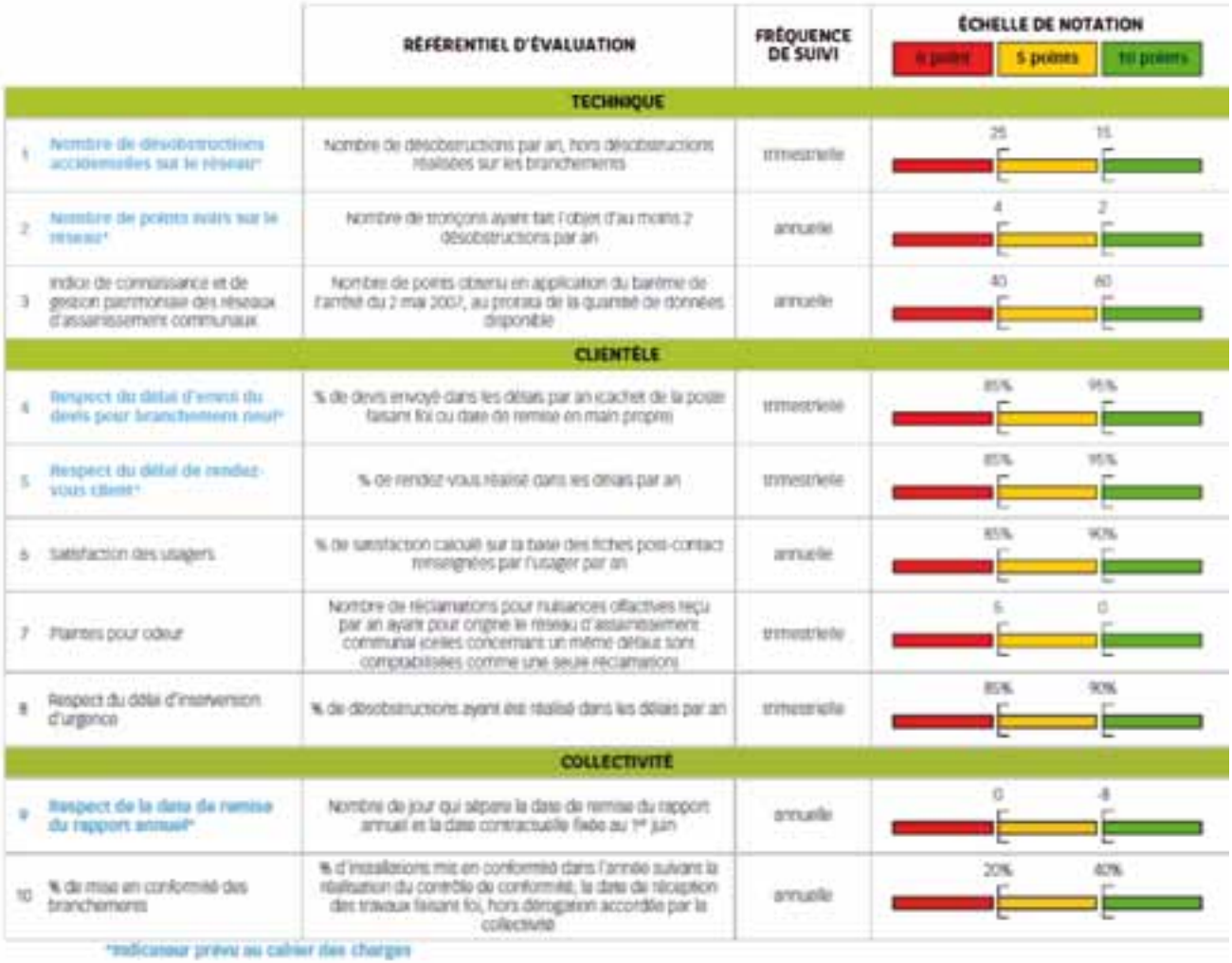
- An introductory statement from the delegating authority outlining the objectives of the service, broken down into categories (environment, resource, energy, patrimony, social, governance, etc.) and associated with pre-identified issues for the length of the contract; similarly, the **system of indicators** and the **forecasted values** would be established subsequent to negotiations (for reasons of simplicity, and given the disparate values of the various indicators, a point system is recommended)
- In the compensation clauses, the **conditionality** of part (expressed in % of total sales) of the delegate's **compensation** when the "programed" performance level is reached (assessed yearly), as well as the economic value of the performance point
- A specification, in the provisional operating statement annexed to the contract, of the **"performance" share (investment and operational)** in the economic balance of the service
- The principle of an **annual assessment** of the performance level **by an independent third party**

We should also point out that during the procedure, negotiations should focus on a quality/price analysis that would be consistent with the ambitions initially set by the community.

Specific example of the contract with Bry-sur-Marne, managed by Lyonnaise des Eaux

For the city of Bry-sur-Marne (94), the renegotiation of the wastewater contract dealt both with improving technical and performance customer management (reduction of complaints due to odors, emergency responses, etc.), and on the necessity to restore greater transparency in the management of water services.

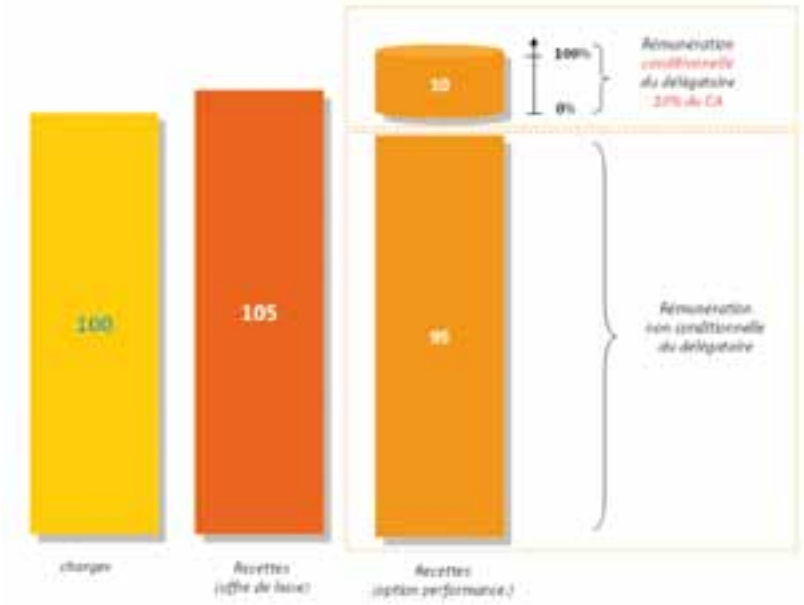
Lyonnaise des Eaux created with the municipality a system with ten performance indicators to that was associated a "sustainable



performance fund". A fixed sum was set aside every year and made available depending on the status of each indicator with respect to an assigned value.
The resources committed to reach the high performance level expected justified a revenue level that was potentially slightly higher than the basic level.

However, any potential increase in revenues is subject to the approval of the municipality after effective scrutiny of the delegate. The delegate risks up to 10% of this potential revenue should it fail to respect its commitments.

In any case, should only part of the fund be paid to the delegate, the remainder for that year shall be ceded to the municipality, and shall not be carried over.



ENERGY EFFICIENCY IMPROVEMENTS IN JEDDAH WATER SERVICES

Caroline Mairesse[1]
& Alain Mathys[2]

An example of successful joint commitment between the authority and the operator

KEY WORDS: management contract, KPI, incentive, Saudi Arabia, energy efficiency

Historical Situation & Key Challenges of the Saudi Water sector: Low Efficiency, Weak Performance

Saudi Arabia is a Kingdom of 26 million inhabitants, faced with a growing population and rapid economic development. These two factors create a substantial increase in demand for water and wastewater services, while the country encounters several obstacles:

- Lack of natural resources and high water production cost
- Insufficient and poorly-maintained infrastructure (>40% water losses, 2/3 of the population not connected to sewers)
- Poor quality of services (discontinuous water supply, poor customer service)
- Lack of human resource capabilities and know-how
- Weak organization and public discontentment

In light of this situation, the government of the Kingdom of Saudi Arabia launched an ambitious reform of the water sector aiming to provide the major cities of the Kingdom with modern and performing utilities. The major component of this reform was the creation in 2008 of the National Water Company (NWC), a Saudi joint stock company fully owned by the government in charge of restructuring the national water and sewerage sector. NWC established partnerships with the private sector for promoting the performance and effectiveness of the sector.

In 2008, the NWC contracted Jeddah Water Services (JWS), a joint venture between SUEZ ENVIRONNEMENT and Aqua Power Development to manage Jeddah City Business Unit (JCBU). Since September 2008, JWS has mobilized a team of competent professionals, set up the organisational framework, and provided coaching and leadership of the staff of JCBU, with the objective to meet, or exceed, the service delivery performance described in the management contract.

Make the water sector attractive and boost its performance: the challenge of Jeddah Management contract

CHARACTERISTICS OF THE CONTRACT

The contract signed in 2008 is a 7 year management contract characterized by a large array of services provided: water supply, wastewater collection and treatment, customer service, Capex management, etc. The contract employs over 1400 staff and serves a population of more than 3.5 million inhabitants.

The objective of this contract is clearly stated: make the water sector attractive and boost its performance. This goal shall be achieved through three factors:

- **a world class service in Jeddah**, with an access to drinking water 24 hours a day, 7 days a week, an emergency response time to repair leaks divided by 3, a fight of overflow from about 1,000 km of wastewater collection networks
- **effective transfer of knowledge**, with a comprehensive training program for the 1,400 staff and the setting up of a training center
- **Measured performance**, through 21 Key Performance Indicators defined in the contract

The management contract gives JWS the entire responsibility to provide groundwater production and treatment, water distribution and wastewater collection and treatment services in the city of Jeddah. NWC provides to JWS the necessary resources (operational expenditures and capital expenditures

1_ Department of Relations with Institutions, SUEZ ENVIRONNEMENT
2_ Contract Compliance Manager, SUEZ ENVIRONNEMENT , National Water Co., Jeddah City Business Unit

budgets), and the 1,400 employees (who are NWC permanent staff).

A PERFORMANCE BASED CONTRACT

Jeddah contract is strongly performance oriented: three types of contractual indicators have been defined and apply to JWS, which conducts constant regular reporting to the authority:

- Key Performance Indicators (KPIs), which are indicators leading to bonuses or penalties
- Internal reporting measures and External benchmarking measures are reported for information, but do not lead to any additional or reduced fee

21 KPIs have been defined in the contract, from service continuity to leak run times and availability of wastewater pumps. Power consumption for the water service is one of these KPIs. This is justified by the fact that power tends to represent the first variable cost component of the service (between 10 and 30% of the total cost). Still, setting energy efficiency as a joint commitment between the local authority and the operator through a system of contractual KPI, leading to bonus/penalty, remains uncommon and deserves attention.
Power consumption efficiency is measured for the water supply services. Wastewater efficiency is measured by BOD5 removal efficiency for all the plants under JWS direct management.

KPI on power consumption: a joint commitment of the authority and the utility

DESCRIPTION OF THE INDICATOR AND INCENTIVE SYSTEM

The KPI on power consumption for Jeddah water services is defined and calculated as follows:

Description	Average annual Megawatt hour used to supply 1000 cubic metres of water to customers connected to the water distribution network
Method of calculation	Total annual power used to supply water / (total annual volume water supplied / 1000)

A baseline reference has been set, which corresponds to the average electricity consumption at the launch of the contract.
A target value for power consumption has then been allotted for each contractual year.

	Baseline value	Year 1	Year 2	Year 3	Year 4	Unités
Power consumption	0.158	GP	0.155	0.145	0.142	MWh/ 1000m³

	Baseline value	Year 5	Year 6	Year 7	Unités
Power consumption	0.158	0.139	0.136	0.134	MWh/ 1000m³

GP: grace period

A complex system of bonus and penalty is designed as an incentive for energy efficiency improvements :
if a performance considered as excellent is reached (e.g 0.148 for year 2), then a fixed percentage of the annual fee is paid as a bonus; For this specific KPI the incentive compensation value is 1% of the annual operating fee for non-wastewater treatment plant facilities related services.
if the performance reached is situated between the target value and the excellent performance, then the bonus is calculated pro rata of the value obtained;
if the value obtained is inferior to the target value, then 'performance points' are accumulated. The total accumulated performance points during a year correspond to KPIs which are not fulfilled or delayed, and lead to deductions from the annual fee.

PERFORMANCE REACHED BY JEDDAH

In January 2009, the KPI value was 0.149 MWh. This value decreased progressively during 2009 and reached 0.111 MWh in January 2010.
In 2010, the contract has exceeded, to a large extent, not only the target value for the year, but also the end of contract value: while the contract allowed for a power consumption of 0.155 MWh/1000 m³ in 2010, decreasing to 0.134 in 2015, JWS reached a performance of 0.101 MWh/1000 m³ in 2010.
This performance has been enabled thanks to an optimisation of the management of the distribution network and related pumping stations and by the reduction of water leakage in pipes. Improved management of the water distribution network consisted in the implementation throughout all the city of distribution zones and in optimizing the rationing program. These activities resulted in the operational improvement brought by SUEZ ENVIRONNEMENT and Aqua Power Development to Jeddah Water Services.

KPI 4.1: Power Consumption

2010	0.101MWh
Target	0.155 MWh

Conclusion and lessons learnt

The good performance achieved by Jeddah Water Services has been allowed thanks to:

- a strong public willingness and effective decision to reform the water and wastewater sector,
- a well-designed management contract, performance-oriented, with a strong and complex incentive system,
- the choice of renowned operators, able to grant technical quality

The energy efficiency improvement of the service is placed as an integral part of this strategy, as a joint commitment between the local authority and the operators, which allowed to reach an excellent performance.

This approach could usefully be replicated to other contracts, and is a useful way to address the challenge of energy for water, an issue which will become all the more important as an increase of the cost of energy is likely in the future, and which can serve strategies of improving affordability of the service for the poor fraction of the population.

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MONITORING WATER SERVICES IN SMALL CITIES AND TOWNS IN DEVELOPING COUNTRIES

Denis Désille[1]
& Daniel Faggianelli[2]

KEY WORDS: drinking water, expertise, external control, performance, pooling

Small-scale drinking water networks: complex systems in fragile environments

In developing countries, towns and small cities (2,000 to 50,000 inhabitants) lack the experience and expertise that is usually available within a distributor of drinking water with a national profile and presence, whether public or private. Yet the challenges it faces are no different, even though on a much smaller scale. They must oversee the proper function and longevity of the infrastructure and equipment while ensuring economic viability. They also have to respond to social and environmental demands and ensure transparency (notably financial transparency) of the public water service.

While small municipalities may demonstrate real know-how and expertise in the management of drinking water networks, they nevertheless suffer from a variety of weaknesses and deficiencies: inadequate expertise in network operation (usually delegated to a private entity or association); the contracting authority (most often the municipality) has difficulties with the contractor; financial problems due to insufficient cost recovery from certain users; the contract fails to adequately spell out the roles and responsibilities of each player; a lack of transparency in the water service accounts, etc. In the end, the water services in small communities are often plagued by fragility that threatens their longevity and the quality of their service.

Monitoring water services or outsourced expertise

To improve the quality and durability of their service, many countries have implemented monitoring mechanisms that include:

- Collecting – usually once or twice a year – operational related data **(technical, economic, financial, organizational, institutional data, etc.)**
- **Analysis of the operational performance of the network on the basis of objective criteria.**
- **Submitting results of the analysis along with recommendations for improving management.**

The results are submitted to users, operators and the owner. Each of these players will have specific yet potentially very different expectations with regard to the water distribution service. In order for the monitoring of the three activities (collection, analysis, and submission) be conducted in a neutral and objective manner, these monitoring tasks should be given to a third-party with no connection to local water services management. Its status, which may vary depending on the country, can be either public or private.

1_ Solidarité Eau Program
2_ ACQUA-Oing

Monitoring costs

Overseeing monitoring duties necessitates considerable technical and financial expertise in water services and may also require regular trips to outer-lying villages situated in regions that can be very isolated and difficult to access. There are thus costs associated with monitoring, of which the recovery varies from country to country. However, in countries with the most experience in terms of water service monitoring (Mali, Niger, and Chad have a cumulative 40-year track record), the costs are passed on to the consumer, increasing the rate by between .03 and .09 Euros per square meter, or about 5 to 10% of the actual production cost per meter. This charge, which is initially added to the water rate, almost always saves the user money: regular audits of the water service are valuable in that they allow for an optimization of the operating costs of the water service. Both operators and municipalities have understood this and have embraced monitoring services. In Chad, the communities in the Moundou region initially rejected monitoring in order to reduce costs, but they were soon confronted with rising operating costs and the base water rate skyrocketed. These communities reversed their decision and requested monitoring services, which helped stabilize and subsequently reduce water service costs.

Monitoring costs can be prohibitive if they are shouldered, even temporarily, by a single small city or town. To lower these costs to an acceptable level (not in excess of 10% of the production cost of water), the pooling of several towns or small cities within the same region to outsource a single monitoring service is the solution all other countries have adopted. The notion of pooling is one of the keys to the economic viability of monitoring, regardless of the means of financing.

The impact of monitoring on service longevity

Some countries have had sufficient experience with monitoring water services to be able to precisely spell out the advantages brought about by the service (in Mali, monitoring services were first begun in the early 1990s).

Other than improving the quality of water services, the first added value of monitoring is a significant **drop in the number and the length of water service disruptions**. The recommendations made following the technical audits improved maintenance and preventive actions carried out by the operator. When a breakdown occurs, the outsourced monitoring service is consulted immediately and requested to conduct remote diagnostics or to facilitate and accelerate delivery of replacement parts.

Another significant advantage of monitoring is the impact it has on **improving the financial status of the water services**. This is due in part to lower operating costs and to a higher recovery rate of users' accounts receivable. The monitoring of the water services in small towns and cities has systematically proved to be good investment that saves more than it costs.

In impoverished rural zones where communities have limited fiscal resources, the drinking water network is often the only productive system that generates substantial revenue. The savings of small networks put aside to renew equipment and infrastructure quickly become the source of tensions to reattribute use of these funds in other capacities. In such situations, monitoring helps augment and secure earmarked funds in bank accounts, by requiring dual endorsement (those of the contracting authority and the contractor).

Monitoring is also a powerful **water services pedagogical tool**: by submitting data to all the players in adapted formats, it improves an understanding of water services and of the stakes involved. Most important, it regularly reminds users of the necessity to pay a fair price for water by explaining the different uses of the revenues (financing operational and rehabilitation costs) and facilitates acceptation of the water rates when they climb higher.

If monitoring contributes to understanding the stakes of water services, **it also empowers users**. They are able to express their expectations regarding service improvements and to express their dissatisfaction, in cooperation with the contracting authority, of poor service or abusive practices.

And finally, monitoring is a **transparency tool and helps in conflict resolution**. Public briefings remind the players of their responsibilities and obligations, enabling a dialogue that is based on indisputable performance indicators – which streamlines the discussion.

In the final analysis, monitoring reinforces the capabilities of water services players in the structurally fragile environments of small cities: it gradually enhances the knowledge and competence of the operator; it strengthens the community in its mastery of performance indicators which enables it to detect

service failures and sanction them; and it informs users of the viability of the service that they pay for.

Stakes and long-term perspectives

Today, monitoring activities have sufficient demonstrable experience as well as contextual and geographic diversity to justify their relevance and added value in terms of the durability of water services in small towns and cities. Currently, a dozen developing nations have implemented monitoring in varying forms with approaches that are specifically adapted to the issues and to local and national institutional organizations. However, it is worth noting that the principle of monitoring poses certain deployment difficulties. A number of countries that had adopted monitoring as a sectoral policy are dragging their heels in implementing it systematically throughout the country. And countries with no monitoring at all, despite being confronted with poor service sustainability in small cities, have failed to implement any effective measures to remedy the situation.

Low water access rates in these countries and a priority placed on the rehabilitation of infrastructures explain in part the lack of interest in matters of durability: the need to build new installations and structures undermines emphasis on the basic issue of operating the installations, and the "construction" mindset wins over the "durable water services" mindset. This assessment is not limited to the governments of developing nations. Many decision-makers, whether in the north or the south, relegate durability as secondary or they mask the stakes involved in the operation of water services.

Monitoring is thus not just a tool to be implemented in the context of small communities in developing countries. It is also a plea for official development aid and to all players in the sector to adapt their approaches so that they are resolutely focused on ensuring the durable operation of water services. **The infrastructure to provide drinking water has no intrinsic value. Only its ability to provide durable service to all should be regarded as valuable.**

MORE INFORMATIONS:

The platform for exchange on monitoring water services, created by the Agence française de Développement, the Syndicat des Eaux d'Ile de France, the 'Agence de l'eau Seine Normandie and the GRET, and managed by ONG ACQUA and the Solidarité Eau program, identifies and provides information on monitoring mechanisms that have been implemented in developing countries – **www.reseaux-aep.org**

MALI, 15 YEARS OF MONITORING SMALL DRINKING WATER NETWORKS

Created at the end of the 1990s as a pilot project, the *Cellule de Conseil aux Adductions d'Eau Potable* (CCAEP) began by supervising 10 drinking water networks before expanding its activities to include over 60 networks throughout the Malian territory in the early 2000s. Now fully integrated in the Malian strategy for water services management, the Suivi Technique et Financier (STeFi) has a mission of support and advice to the operators of mini-networks and won calls for tender in 2004 to provide services to two private water services. Today, it oversees more than 200 drinking water networks that are audited twice a year. The results of these audits are submitted to a general assembly of users, and each operator has access to the support and advice of SteFi on a daily basis. The feedback from this support and advice has been unanimously very positive. For example, the 106 water networks in the Kayes region (western Mali) have an average efficiency rate of 93%, their payment arrears are less than 10%, and they have a cumulative savings of two million Euros for equipment rehabilitation.

HIGHER QUALITY WATER SERVICES IN BUCHAREST AFTER THE 10TH ANNIVERSARY OF THE PPP

{ Epsicá Chiru[1]

KEY WORDS: concession, governance, services' objective, economic impact, Romania

In March 2000, after an international call for tenders, the municipality of Bucarest awarded Apa Nova Bucuresti (a subsidiary of Veolia Eau) a 25-year contract for the management of its water supply and wastewater treatment utilities. The concession contract is a performance agreement: 24 technical and commercial performance indicators are defined with targets to be met over time. The concession holder Apa Nova plans the investments required to meet the objectives. The failure to meet contractual objectives may entail penalties for the concession holder if corrective measures are not effective, or it may freeze tariff increases provided for in the agreement. A Technical Regulator checks and certifies performance level compliance.

Ten years after the start of the agreement, Apa Nova has transformed the performance and quality of water supply and wastewater treatment services. All performance levels meet the contractual requirements. Water losses were reduced by 150 million m³ between 2000 and 2010, attaining the distribution system efficiency target of 58% in 2010, with a decrease in users' consumption (volumes sold have been virtually cut in half since the start of the contract). Water quality has considerably improved, from less than 70% of samples compliant with current standards to total compliance. Consumer surveys show that satisfaction has significantly improved. To bring about this transformation, major efforts have been made in the company to improve labour relations, training and working conditions. All of the actions have been implemented while maintaining affordable water tariffs, among the lowest in Romania's large municipalities. The results have been achieved, in particular, thanks to the involvement of the various stakeholders and to efficient contract regulation mechanisms.

In the 1990s, more than half of the population of Bucharest was not satisfied with the faltering water and sewerage utility[2]. Water service was intermittent and unreliable, and pressure was low. Non-revenue water amounted to nearly 50 percent of water produced. Customers complained about considerable billing inaccuracies, as only 60 percent of the water sold was metered and consumers were charged on the basis of an estimate of their average consumption. The municipally-owned and -operated Bucharest Water and Sewerage Company (Regia Generala de Apa Bucuresti, or RGAB) was barely able to cover its operating costs by tariffs revenues collection. Money for new investment had to come from the Municipality or national government, but public funds fell far short of the amount needed to rehabilitate the decaying infrastructure, let alone to expand it to improve service and sewerage coverage. The Municipal Government came to see private participation as the best way to solve the problems of the sector. Convinced that the public sector lacked both the funds and the expertise to turn the water and sewerage services around, the Municipal Council asked the IFC[3] to help in bringing in a specialist private firm to finance and manage the system. Citizens agreed that private-sector participation was the most effective way to improve these services[4].

Governance of the public-private partnership

In March 2000, the Municipality of Bucharest delegated responsibility for management of its water and sewerage systems to Apa Nova, a subsidiary of the international water operator Veolia Water. Apa Nova was created as a special-purpose vehicle to be the private party to the concession contract, with

1_ Deputy CEO of Apa Nova Bucuresti SA, epsicá.chiru@apanovabucuresti.ro, 2 Street Aristide Demetriade, Sector 1, 010 147 Bucharest (Romania)

2_ Ioan Radu, Viorel Lefter, Cleopatra Sendroiu, Mindora Ursàcescu, and Mihai Cioc - Effects of Public-Private Partnership in Water Supply and Sewerage Public Services. The Bucharest Academy of Economic Studies, 2009

3_ International Finance Corporation (World Bank Group)

4_ Survey carried out by the IFC in 1998. The results of this survey are reported in the Information Memorandum for the concession transaction ("Information Memorandum: Bucharest Water and Sewerage Investment Opportunity"), published in March 1999.

Veolia Water owning 83.7 % and the Municipality owning the remaining 16.7 % (corresponding to the value of the assets that the Municipality transferred to Apa Nova). Later, in 2007, Apa Nova employees acquired ten percent ownership in Apa Nova.

The delegation was by way of a 25-year innovative Concession Contract, awarded following an international competitive tender. **The municipal objectives** for water and sewerage services to be achieved through the Concession Contract were[5]:

- Complying with EU standards for potable water and sewerage services at the lowest possible tariffs;
- Running services that are financially independent from Municipal and Governmental funding;
- Improving efficiency and operational performance;
- Avoiding monopolistic behavior and obtaining sustainable contractual arrangements;
- Increasing environmental protection and pollution control.

The Bucharest Concession Contract sets out the rules governing the relationship between the private party (Concessionaire) and the Municipality. Among the most important features of the contract, we must stress the following five points[6]:

- **The contract is output-based**. Services obligations (levels of service targets or LOS) are clearly specified and have to be met in accordance with the related time schedule. The type and amount of capital expenditure required to reach LOS are not imposed (with the exception of the Crivina-Ogrezeni water treatment plant), and are planned at the discretion of the concessionaire;
- Compliance with some specific LOS is a mandatory required condition before triggering tariff increases;
- Tariff setting rules are set out, and the economic regulator – the national competition office (ANRSC) – supervises the correct application of the rules;
- Evolutions in the labor force were managed by a social plan pre-agreed in the contract, which provided a reasonable protection to workers;
- Usual discrepancies between the parties were easily addressed and fixed thanks to a dispute resolution mechanism involving the economic regulator, a separate municipal technical regulator and an international expert panel, which was set out by the contract.

Crivina WTP during construction works (in operation from June 2006)

Apa Nova must operate and maintain water and sewerage infrastructure serving **2 million people**, as well as plan, finance, procure, and supervise capital expenditures to meet 24 LOS specified in the concession contract. The LOS are related to water service, sewerage service and commercial relationship with end-users. A reference baseline for each of the 24 LOS indicators has been defined at the beginning of the concession. And the improvement of the LOS over time per comparison with the baseline is set out in the contract. Compliance of LOS with the targets is checked by a municipal agency empowered as technical regulator. And any failure to achieve the LOS on time, if not efficiently corrected, prevents the enforcement of contractual tariff increase and sometimes triggers the payment of financial penalties.

Performances of the partnership

During the first ten years of the concession, **the stakeholders involved were able to overcome difficult challenges**, and the concession greatly improved services in Bucharest at a relatively low cost[6]. All LOS have been met so far, and in particular:

- Bucharest's **water quality** considerably improved. In 2009, the technical regulator reported that Apa Nova met the standards for all water quality parameters included in the concession contract[7]. Per comparison, according to Bucharest's Public Health Department, only 69 percent of samples taken from the distribution network complied with the required standard for residual free chlorine in 2000.
- By the end of 2008, **low water pressure** problems were totally fixed.
- **Pipe breaks** decreased from nine per kilometer in 2002 to four per kilometer in 2009 (a compound average reduction of ten percent annually) and further improvement are expected in the future thanks to planned repair and replacement works.

5_ Mircea Macri, Bucharest Development through Public-Private Partnership – Apa Nova Project , Presentation at the Conference "Best Practices in Water Utility Management, Finance and Performance Improvement", Herceg Novi, Montenegro 2007

6_ Castalia Advisory Group, Evaluation of the Bucharest Water and Wastewater Concession, Final Report to the International Finance Corporation, May 2010 (confidential, not published)

7_ Mircea Macri, Epsicá Chiru, Changes in water quality in Bucharest (2000-2009) , Poster, Conference Cities of the Future 2011, in Stockholm, Sweden (22-25 May 2011)

- Even if **water and sewerage coverage** was already high when the concession started, water and sewerage coverage in Bucharest increased from 91 to 93 percent between 2000 and 2009. This level is higher than the coverage in other Romanian cities, which averages 86 percent for water and 73 percent for sewerage.
- **Metering** has improved substantially. While 91 percent of connections in Bucharest were metered in 1999, the rate is now 100 percent.
- **Client Services** have improved, with the metering of all the customers, new customer reception areas and a new Call Centre to deal with customers requests 24 hours a day.
- **Customer satisfaction** is drastically up, from 46% in 2002 to 75% in 2008 (Gallup measure); customer complaints dropped from 11,462 in 2001 to 1,056 in 2008.

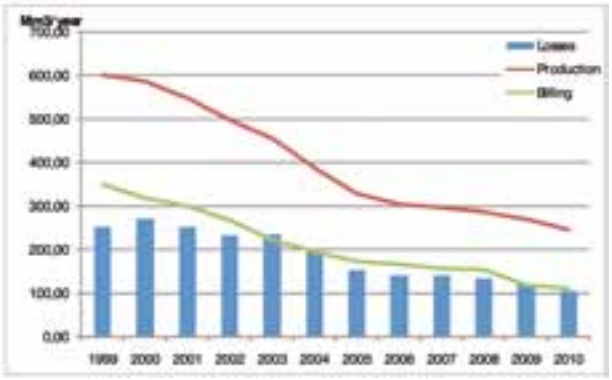
Since the beginning of the concession, Apa Nova has invested US$258.8 million, equivalent to 30 percent of its total revenue over the period[8] (2000-2009). Unlike the other Romanian utilities, Apa Nova financed all its operations and investment without subsidies, and the tariff remained affordable. The financing of the Glina waste water treatment plant was out of the scope of the concession, and the construction works are currently managed by the Municipality and paid thanks to European and Governmental aids under Cohesion policy. Today, **tariffs in Bucharest are in the low range in Romania: according to the Romanian Water Association**, water and sewerage tariffs in Bucharest are on the 42nd place in descending order out of the 44 operators with 1st Class License in Romania as of April 2011. Apa Nova has invested in new equipment for better qualifications. Numerous training sessions have been organized, with more efficient operation and improvement of working conditions, with a strong focus on health and safety at work.

Moreover, Apa Nova significantly improved operational efficiencies[9, 10], contributing to sound sustainable environmental management by:

- Preserving water resources with a reduction by more than 50% of raw water abstraction quantity (Figure 1)[9],
- Increasing energy efficiency with a reduction by circa 75% of annual electricity consumption between 2000 and 2010, allowing a cumulated decrease by **800,000 tons of indirect greenhouse gas emissions** for the period 2000-2010 (Figure 2)[11].

Further environmental improvement are expected in the future, when the new Glina waste water treatment plant co-financed by the European Union and the municipality of Bucharest will be commissioned and handed over to Apa Nova for operation. By installation of waste water treatment, sewerage service in Bucharest should meet the European standards for urban sewage.

Figure 1: Reduction of water losses (1999-2010)[9]



One re-pumping station before (the left image) and after modernization (the right image)

8_ Chiru, Epsicá, Poster, Progresses in the sustainable management of the production and distribution of drinking water for Bucharest City, Poster, Conference Cities of the Future 2011, in Stockholm, Sweden (22-25 May 2011)

9_ Bruno Janin - Presentation at the Conference "Public Private Partnership in the water sector", April 12, 2011, Skopje, FYR Macedonia

10_ Epsicá Chiru - Apa Nova Bucuresti - parteneriat pentru dezvoltarea durabilá a orasului, Presentation at the Conference « Dezvoltarea urbana in Europa de Sud-Est », June 13, 2011, Bucharest, Romania

Old (left image) and new(right image) equipments for interventions

Figure 2: Annual electric energy consumption over the period 2000-2010 and related reduction of annual greenhouse gas emissions per comparison with year 2000[9]

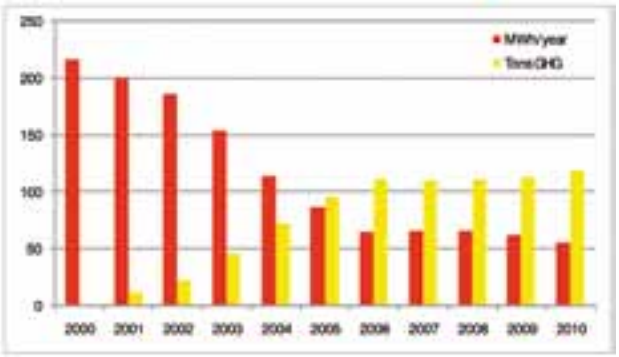
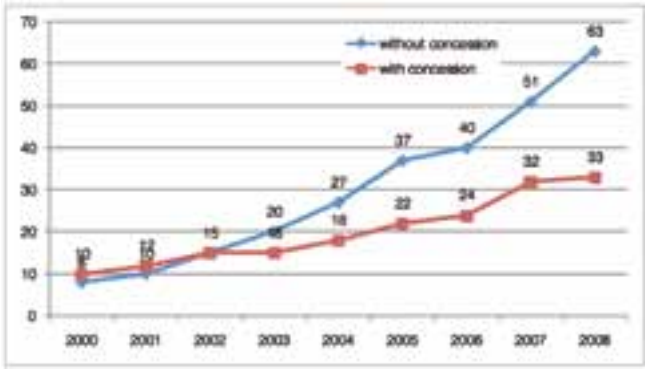


Figure 3. Average monthly household bill with and without the concession, 2000-08[8]



Measuring the economic impacts of the improvements

To test the total impact of the concession on costs, a financial simulation model of Bucharest's water utility was constructed[9]. The model shows that if the utility had made the same investments in improved service, but with the efficiencies observed in Romanian utilities that do not have a public-private partnership, the total cost of service provision over the period 2000-08 would have been US$349 million higher.

The people of Bucharest would have borne this additional cost, through either higher taxes (if the municipality had been called on to subsidise the company) or higher bills. Indeed, under continued public management, achieving the same LOS would have required almost doubling the bills for a typical household. The 2009 bill for a typical household was just over half what it would have been in the scenario without concession[9].

In accordance with the conclusions of the article "Water in Bucharest - A Utility's Efficiency Gains under a Concession"[11]: The concession of Bucharest's water utility has brought its citizens higher-quality water and sewerage services, at a lower cost, than they could have had under continued municipal provision.

The credit for this goes to:

- the leadership of the municipality and the municipal utility in the late 1990s, which saw that private finance and management were needed to reverse the cycle of poor performance;
- the managers and staff of Veolia and Apa Nova, who have made the utility work;
- the union leaders, who were able to chart a new course; and
- the municipal technical regulator, which ensured that the public interest was protected throughout.

As mentioned in the book *Effects of Public-Private Partnership in Water Supply and Sewerage Public Services*[2], **"[…] PPP concluded between Bucharest Municipality and Apa Nova Bucuresti S.A. […] by its performances and restrictions […] represents a guide for good practices which can be generalised to other cities in Romania or in the European Union."**

11_ Earhardt, David; Rekas, Melissa and Tonizzo. Martina, Water in Bucharest - A Utility's Efficiency Gains under a Concession, http://rru.worldbank.org/ documents/ publicpolicyjournal/326-Bucharest-water.pdf

SUSTAINABLE WATER MANAGEMENT, THE CHOICES OF NANTES MÉTROPOLE: **A STRONG ORGANISING AUTHORITY, A BLEND OF MANAGEMENT MODES, THE PERFORMANCE OF THE UTILITIES AND THE PRESERVATION OF THE RESOURCE**

Philippe Marest[1]
Michel Blanche[2]
Maryline Guillard[3]
Yves Gouriten[4]
Olivia L'Honoré[5]
Jean-Luc Perrouin[6]

KEY WORDS: local authority, tariff harmonization, direct management, service delegation, steering

Introduction

The Nantes urban community, Nantes Métropole, is an inter-municipality structure which brings together 24 municipalities totalling around 600,000 inhabitants. It exercises the competence that the municipalities transferred to it, upon its creation in 2001, notably the responsibility for the public water and sanitation utility, as well as the management of rainwater and the preservation of the aquatic environment in favour of an integrated approach to the water cycle. While the management modes were heterogeneous, central control, delegation, with manifold and different contracts and tariffs as numerous as the number of municipalities, it was confronted with challenges on how to organize these services in good conditions of fairness and quality and preserve the environment under the pressure of a conurbation in the throes of rapid development.

To this end, the councillors decided on structural choices, for the future, which are based on the sustainable management of water: a strong organising authority, a blend of management modes, that is the coexistence of public and private operators on the same territory, the performance of the utilities, based upon the French experience of the public services notably that of organized urban public services networks[7].

Feedback presented on the following pages, illustrates the implementation of neighbourhood actions, which are the daily lot of the urban services, by laying down the underlying principles of sustainable development and the obligations which have been handed back to the local public services. The overall result is part of the commitment made by the local authority to the "Istanbul Water Consensus", a pact which recognises the importance of water as a public asset and the need to manage it well so as to guarantee good access of the populations to this precious asset.

The experience of Nantes Métropole: the choice of a strong organising authority

The concept of organising authority comprises two fundamental elements:

1_ Deputy Managing Director Nantes Métropole, environment and urban services, Vice-Chair of the ASTEE
2_ Director of sanitation – Nantes Métropole
3_ Director of Energy, Environment, Risks – Nantes Métropole
4_ Director of the Mission for the integration of public services – Nantes Métropole
5_ Director of the Mission for the support and coordination of the department of the environment and public services – Nantes Métropole
6_ Director of Water resources – Nantes Métropole
7_ Control of urban public services organised in a network, Advice of the Economic and Social Council presented Claude Martinand, Living Standards Section, 2001

- an authority elected by the citizens of the conurbation;
- an authority with an obligatory responsibility for the public services.

The first act of the organising authority was to affirm its role, as the sole legitimate authority public to guarantee the service and which implements the obligations of service public. Hence, the challenge was to give to Nantes Métropole, upon its creation, the means of playing this role capital.

The missions of the authority organising s'inscrivent in relation to the legislative and regulatory framework in France[8] and European directives, which define the fields of competence and the terms and conditions for their implementation. They also depend on the level of control required by the local authority within the margin for manœuvre that the legal texts allow it in the exercise of its competence. These missions have therefore either an obligatory character or they correspond to the deliberate choice of the local authority.

The determination of the level of control required over the urban services is consequently a fundamental decision. The choice made by Nantes Métropole was that of a strong organising authority with the capacity for controlling the whole range of essential levers, that is a real capacity for action.

With this goal, the missions of the "Nantes Métropole" organising authority were defined and the functions of the organising authority very clearly separated from those of the operator so as to avoid any confusion in the roles and better target the expertise necessary. The same applied to the organisation of the departments in charge of these missions. So as to affirm the preponderant role of the organising authority, overall control of the majority of the investments remains the domain of the local authority. The competence of the services was reinforced so as to set the organising authority on a solid and sustainable base, notably by keeping a part of the supervising agency services in house. Concretely, since the end of 2003, the structures concerned were provided with public service organisation departments, distinct from the public operators when the latter existed, with responsibility for implementing the following important missions:

- the definition of the strategies in particular to get to know the needs to be satisfied and their evolution in the short and long term;

- the definition of the level and the quality of the services at the core of the missions of the organising authority;

- the overall control of the fundamental investment work, networks and facilities as well as those concerning the aquatic environment so as to retain control of the scheduling of work and hence the investment expenses;

- the tarification policy and management of the means;

- the controlled execution of the utility through clearly formalised commands, vigilant and appropriate control, finally an evaluation of the service provided and of the operators.

The example of the harmonisation of tariffs illustrates concretely the action on one of the essential levers, that of the tarification policy. Indeed, one of the priority projects for the urban utilities consisted in introducing a single price for water for the user. Initially, there were within the perimeter of the urban community, 11 tariff zones for water and 23 for sanitation. This diversity was increased by a multitude of terms and conditions leading to more than 200 tariff elements likely to intervene in the preparation of a water bill with prices ranging from single to double.

Faced with this situation, the councillors wanted to simplify the water and sanitation bill and harmonise the overall price of water before tax for the user, which corresponded with the cost controlled by the local authority. This action was undertaken in December, 2001 with the simplification of the bill for a better transparency of the price paid by the user. It was completed in 2006 by a single rate determined within a dual concern of maintaining the financial equilibrium of the two ancillary budgets while reserving the capacity for any short and medium term investment necessary especially for the upkeep and modernisation of the network.

This upheaval in the tariff structure took place without any alteration to existing contracts. However, 37 riders were necessary and it has to be pointed out here that all the stakeholders accepted the initiative that was undertaken. At the end of this process over the period 2001-2006, 60 % of the inhabitants had to bear an annual increase below the level of inflation and 35 % actually saw their bill decrease, at times substantially (- 10 % to – 35 %). The miscellanaeous elements such as participation in connection to the sewage network and the connection expenses were also harmonised throughout the territory.

The control of its tariff policy by the local authority thus enabled this harmonisation to take place with a very moderate increase over the period without impact on investment projects and at the same time an improvement in the level of service for the user.

8_ In several codes including notably French Code *Général des Collectivités Territoriales* (articles L 2224 and R 2224) but also for example *Code de l'Environnement*

The experience of Nantes Métropole: the choice of a blend of management modes

The question of management modes was raised in terms of the choice of one mode compared with another. Numerous studies had examined this question by comparing various modes management. Overall, no mode came out on top or fell short and experience proved some very contrasting situations in favour of one mode over another for identical activities. Furthermore, the *Conseil d'Etat* (State Council) considered the question of the *"respective place of centralised or delegated management"*[9] as a false problem.

This question should in no way camouflage the essential stake of the role of the organising authority. Indeed, the question is about confronting management modes to find out if centralised control or delegation to a private operator is more effective than giving the organising authority the objective elements which enable it to organize the public utility in a operational way. The organising authority then had to make its analysis according to its own geographical, environmental, economical, social and political context. This choice should also be enlightened by the need for a free choice by the councillors of the management mode and hence the conditions for its reversibility.

The analysis undertaken by Nantes Métropole led to a search for elements of appreciation of management modes in view of the missions defined for the organising authority. Among the multitude of criteria studied, certain were judged to be decisive and others not, but subject to conditions.

For example, the contribution to the upkeep of the level of professional knowledge, through the contractualisation with a public operator, who may be able to provide a capacity of expertise to the organising authority and participate by correcting the assymetry between the enterprise and the local authority in the system of delegated management, was judged to be decisive. It was the same for the capacity for innovation, notably through the development of new technologies, of the private operators who profit from a wide field of national or international intervention. On the other hand, the quality-price ration was not considered to be decisive unless the competition between the enterprises was well-organised and the public operators adhered to a logic of effectiveness and productivity.

This in-depth analysis led the urban community to establish a blend of management modes that is to say the coexistence of several prjvate and public operators on the sane territory so as to affirm the role of the organising authority compared to the operators, to encourage the emulation between public and private operators and the sustainable performance of the public utilities by guaranteeing the absence of a monopoly.

This choice was founded on three principles and two success factors:

- the complementarity of operators on the territory;
- the comparability of public and private operators;
- conditions for the execution of the utility fixed by the organising authority.
- the upkeep of a relevant volume of activity for the public operators;
- conditions of attractiveness and competition for private operators.

In particular for the water domain, the urban community established the blend of management modes for the distribution of drinking water and the operation of the sanitation networks.

The blend of management modes is also the product of history and an initial territorial context. So as to measure the path covered since 2001, when the distribution of water was organised by 8 syndicates and 3 municipal, the collection and transfer of waste water by 22 municipal and one syndicate, that is 34 public authorities for these utilities alone, the spread between operators henceforth was to evolve in a context controlled by the urban community, the single organising authority.

The experience of Nantes Métropole: the choice of utility performance and the preservation of resources

AN EQUITABLE SERVICE AT THE SAME RATE WHATEVER THE LOCATION OF THE TERRITORY OR THE MANAGEMENT MODE

The effectiveness of a public or private operator is crucial to deliver the utility to the user. Indeed, this is what provides the neighbourly contact, as close as possible to the population. The tone and the quality of its contractual relationship with the organising authority is therefore decisive in fine for the utility as for the user. In this objective, the urban community of Nantes identified the missions proper to the function of public or private network operator:

- to produce a service to the user;
- to upkeep and maintain the assets made available by the public local authority;
- to account to the organising authority and propose improvements to help the public utility progress.

These missions are listed in the contracts, essentially in the form of public contracts with the private operators and in contracts of agreed objectives and resources with the public operator. The interest in having a contractualisation with precise objectives is double-edged: it stimulates the performances of the network

9_ « L'eau et son droit » (Water and the law), 2010 public report of the Conseil d'Etat.

operators and provides targeted control of the organising authority.

Nantes Métropole has introduced contracts of agreed objectives and resources, a framework mainly for actions for the public operator:

- the stakes for the role of each of the players and the demands of Nantes Métropole;
- the schedule of requirements of the public operator, including, where appropriate, the specific missions of this operator;
- the commitment over time to performance with indicators;

This contract commits the public operator through its Director who co-signs the contract with the councilor, the delegated vice-Chair.

These different contracts have identical objectives within the territory, according to a principle of equity. Indeed, all inhabitants have the right to expect a fair service at the same rate whatever their location within the territory or the management mode. With this objective and and alongside the harmonisation of tariffs, the urban community has undertaken to harmonise the level and the quality of service provided to the population. In order to enable a comparison, in perfect transparency, between the operators, the public operators present an annual activity report to the community council.

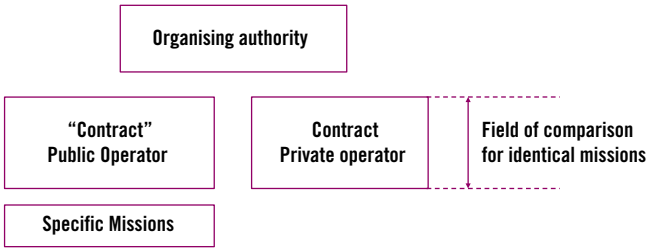
Furthermore, the urban community wanted to go beyond the strict regulatory context (2007 decree) by enriching the annual report on the price and the quality with extra information for example on its projects or investment strategy or even the actions carried out within the context of decentralised cooperation.

These different contracts are naturally part of a dynamic of emulation between operators and competition between private operators. The comparison can be made henceforth on a field of identical missions between public and private operators, concerning the execution of the public utility (Figure 1) :

- at equivalent level of provided service, defined by the organising authority;
- when the quality of service provided has been measured on common indicators and a calculation condition strictly identical so as to be objective;
- when the cost of the service provided only includes the services provided specific to the operators and beyond the missions specific to the public operators. The costs attached to the exercise of the function of the organising authority are to be identified and to be separated from the operators' costs;

The financial criteria should be compared over time, so as to integrate adequate levels of long term investment. Indeed, it is always possible to obtain favourable financial presentations or very competitive costs over a short period of time.

Figure 1: a comparison between operators on a field of identical missions



THE PERFORMANCE INDICATORS: A TOOL FOR RUNNING PUBLIC SERVICES

The choice of performance is based upon three axes:

- the definition of quality objectives for the harmonisation of services throughout the territory;
- dispositions for the identical monitoring and and control for the same missions;
- the introduction of activity and performance indicators for public and private operators.

The harmonisation of services was translated by the evolution of the contracts and the preparation of quality charters.
Thus, a charter for the (drinking) water utility was concluded with all the operators on the basis of twelve very concrete commitments, on product quality, services and customer relations, , for example, the period for the accomplishment of a connection. Applied since January 2005 for the operators, it was transmitted to the 157,000 customers throughout the territory in June 2005.

For the sanitation, Nantes Métropole turned towards a gradual harmonisation in the contracts, taking account of the respective durations. In 2011, the majority of the services provided were harmonised

The level of performance was partly established on the basis of the expertise of the public operators. The search for performance is provided for in the contractual elements for both public and private operators. For the private operators, this process started from the call for tender procedure in the judgement of the tenders with the 'introduction of a criterion of commitment to the objectives of performance to be reached (for example, the linear indices of losses per sector, the rate of response to user mail within the period of 15 days maximum, the rate for the accomplishment of the connections within 4 weeks…). It is incorporated in the formulae for remuneration to encourage performance.
For the public operators, the same performance objectives have been included in the quality, safety and environmental initiatives.

The dispositions for the monitoring and control of the contracts are identical for the same operator missions. In particular,

monitoring and control is carried out during programmed meetings on the basis of monitoring audits of the contracts and performance indicators.

At the same time, Nantes Métropole proceeds régularly with actions by listening and measuring the satisfaction through telephone surveys among representative samples of customers completed by mirror surveys of the operators' agents.

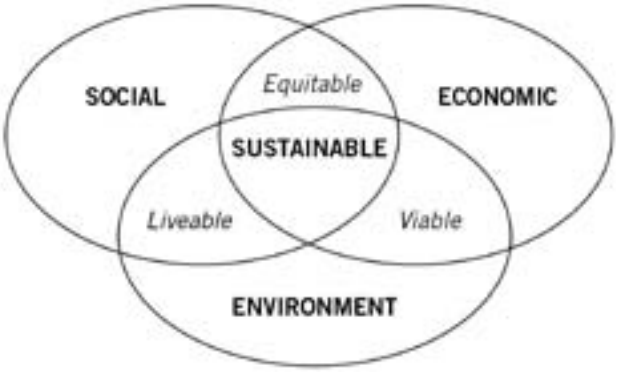
The experience of Nantes Métropole: the choice of an overall approach for the sustainable management of water

The deployment of a policy for water and the aquatic environment requires a strong local organising authority equipped with the resources necessary for the exercise of its role, especially a solid and sustainable expertise.

Indeed, the organising authority has the *"mission of guaranteeing access for everybody"* to the utility by providing it with *"a concrete content adapted to local realities"*[10], in a context of fairness as to the level and the quality of the service and its price, wherever the locality of the habitation or management mode on the territory of the exercise. It has the duty to organise and supervise the correct execution of a fair service for everyone It should preserve water resources in a context where their exploitation is under constant tension and participate actively in the improvement of the environment, with overriding concern for the protection of the biodiversity. It should carry out the important missions of public service and public health by providing, for example, a supply of drinking water which depends upon the capacity and the quality of the resources and hence the ecological status of the environment, or the public salubriousness on the territory for which its responsible. It should therefore contribute to guaranteeing the population a liveable territory.

Thus, the organising authority manages infrastructure networks, services installations the life of which is conditioned by the development and the upkeep in a good state of operation of this collective heritage, both for access to the service and to ensure its neutrality vis-à-vis the environment. It should manage the expenses and the income and in particular the rates which represent the major component. It should determine the needs, prescribe to the network operators and mobilise the financing necessary for a balanced management of the assets. It should control the good execution of the upkeep, the maintenance, the renewals and the extensions of the infrastructure and the facilities, or carry out all or part of these missions, in relation to the contracts. Briefly, it should ensure the viability of the collective assets, a condition for the sustainability of the public service. It thus has three obligations, as regards current and future generations to guarantee:

- a fair service for everyone;
- a liveable territory;
- a viable collective heritage.



The three characters, liveable, fair and viable are at the crossroads of the three pillars of sustainable development, respectively the environment and the social, the social and the economic, the economic and the environment.

Finally, the participation of the citizens in decision-taking, to better inform and better raise awareness of public opinion in sustainable development, is one of the guiding principles of the policies orienting European strategy for sustainable development[11]. Governance in the three player game, organising local authority, citizen-user and network operator, forces the breaking down of barriers and offers a transversal vision. It places the user-citizen at the heart of the public services and ensures its participation in it.

With this intention, the Nantes urban community organised a civic workshop on the public drinking water utility in 2007-2008, which opened the way to a strengthening of the exchanges between the local authority and the French Consultative Commission for local public services (CCSPL) on thematic questions.

The proposed implementation thus fitted concretely within the context of the sustainable management of water, resource and utility.

New perspectives

Because of their stakes, the preservation of the 'environment and urban services represent key factors in the sustainable development of our territories. The initiative carried out in Nantes Métropole has provided the local councillors with an overall and clear view of the management of the different public services for which they are responsible and possess a real decision-making tool. The separation of the organising authority

10_ White paper from the French sustainable development players, World sustainable development summit, Johannesburg 2002

11_ New EU strategy in favour of sustainable development (SSD of the EU) adopted by the European Council at its meeting on 15 and 16 June 2006.

and public operator functions clarifies the roles of each of the players insofar as they are often undifferentiated within the local authorities and thus any confusion between roles is avoided. Experience shows that when the question of management modes is discussed on objective technical bases, with a rigorous approach, the collective debate takes place on fundamentals, in the calm.

The initiative undertaken by Nantes Métropole, heavily impregnated with the French experience of urban services, takes it inspiration from the European debate on services. Above all, it has been enriched with the points of view of the local players, who are confronted daily with the realities of their implementation[12]. This indispensible contribution based the reflection on a concrete foundation and opened the way to an operational application, with several results to be founded on the credit side of this first ten year balance sheet :

- a framework on management modes, made to last, for all the players and notably for the public and private operators;
- harmonised services and tariffs whatever the management mode and the locality of the habitation in the territory;
- a henceforth controlled spread of the operators throughout the territory and a comparison between them on an identical basis; controlled even reduced costs, services provided at least at a constant level but often improving the existing level of service;
- the implementation of the sustainable management of water carried out at.

Nantes Métropole has demonstrated its robustness for ten years, and proven in the fiel, its flexibility and its coherence with regard to the environmental stakes. It opened new perspectives notably in the current context of the interrogation on the outcome of the public utilities and the important planetary environmental questions such as global warming, access to water and sanitation or yet the preservation of the biodiversity. This initiative has been proposed within actions of decentralised cooperation with favourable returns.

The ambition of this contribution is to promote a certain vision of the role of local authorities for the sustainable management of water with the conditions for doing this, in particular that of solid and sustainable public expertise the only guarantee of the independence of the political choices. This the vision of a strong organising authority, of a blend of management modes, of the performance of the utilities and the preservation of resources that Nantes Métropole promotes in the world forums on water which bring together eve ry three years all the organisations in the water domain and are a platform for exchanges and partnership between the various intervening parties on a global scale.

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BENCHMARKING: THE EXPERIENCE OF EAU DE PARIS

Bérangère Sixta[1]

KEY WORDS: comparative analysis, performance indicators, exchange of practices, board

Introduction

Comparative analyses were carried out based on the wishes expressed by several operators working in the same sector to exchange and share managerial and operational practices with the aim to improve performance. These analyses form part of a broader shared approach to ongoing performance improvement. When it comes to water services, the common core of any effort to improve performance is based on providing a reliable service to the user that meets with customer satisfaction, both in terms of quantity and quality.

Due to the level of economic development and certain environmental parameters (demand surpassing supply of resource, etc.), the focus to improve performance has shifted toward optimal economic performance to ensure a level of service that satisfies users while ensuring good resource management.
The benchmarking of water services, in which Eau de Paris is participating, includes services that operate at similar levels of economic development and with the same requirements in terms of minimum customer service levels.

VEWIN's benchmark study

The benchmark study in which Eau de Paris is participating was first created by VEWIN in 2004. The aim was to compare water companies with similar activities operating in the same socio-economic context. Similar benchmarking efforts have since been undertaken by national water associations in Sweden, Norway, and Denmark, and by over 40 water companies in 19 countries, of which most were European.

Eau de Paris was the first French water company to participate in this benchmarking effort. It did so to compare itself with other companies of a similar size in terms of service population.
There are two phases of participation in the benchmarking. The first phase involves the compiling of the data (more than one hundred different data items) required for calculating the indicators. Once this compilation is complete, an initial evaluation is performed. It serves to identify changes in the water service compared to previous years and highlights the strengths and weaknesses of the service.

The second phase involves reporting the findings thematically and in working groups with all the participants. This step helps underscore the differences between the utilities and provides explanations for these differences. At this stage, exchanges between the various utility companies are necessary to identify the differences that may be due either to a more optimized service or to a different context.

Indicators

The indicators used include context indicators and performance indicators. The former are often derived from data over which companies have no control (service population, length of network, number of connections).

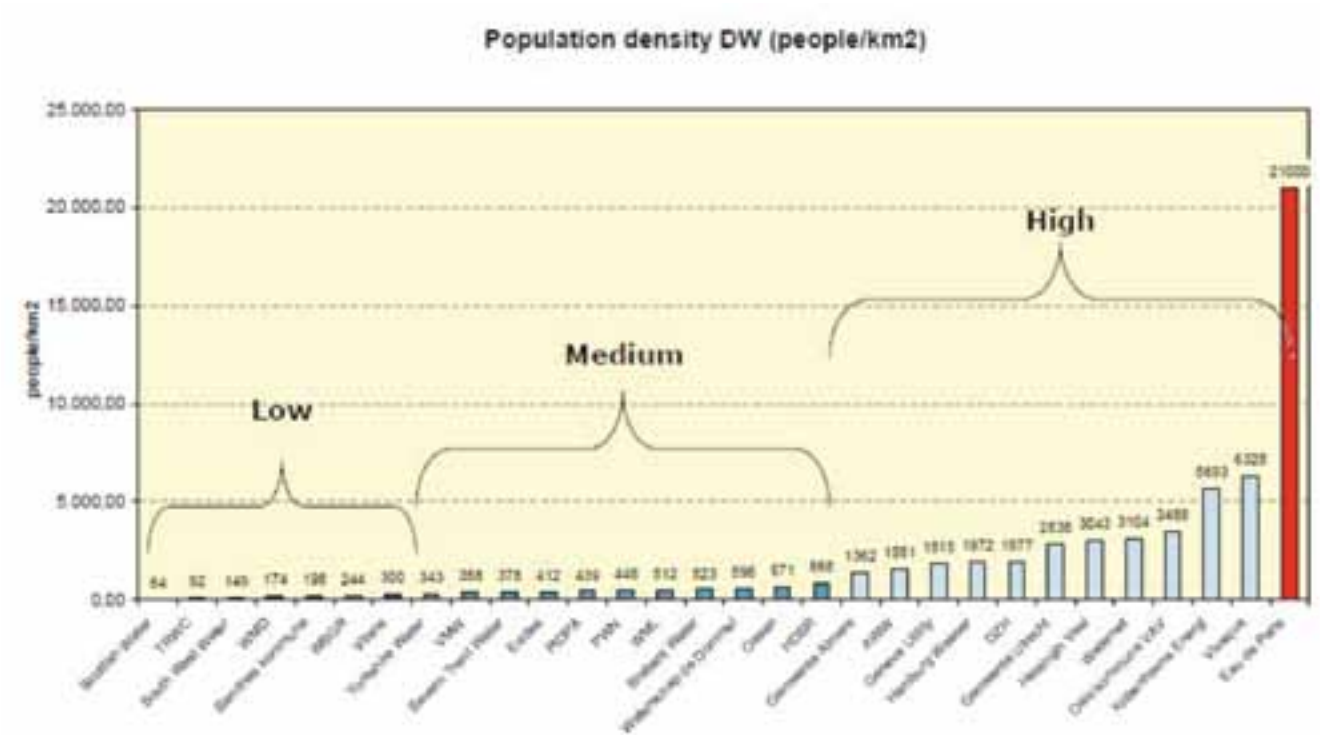
Performance indicators are either raw data that reflect the activity (number of meters of pipes replaced), or a ratio between two indicators (number of meters of pipes replaced over the aggregate length of network). This type of indicator allows a comparative analysis between companies, while context indicators provide the means to interpret performance indicators and to adjust the analyses.

1_ Eau de Paris

For example, the linear indicator of network loss (expressed in m^3/km/day) is high in Paris compared to other water services. Yet, Paris has one of the best efficiency scores in the world. The disparity between these two indicators can be easily explained by Paris's highly dense population. This has led to a network that is limited in terms of conduit network length compared to the water volume it conveys. The contextual data on the density of the population is critical to understanding these disparities.

A comparative analysis makes it possible to consider several areas where improvements are possible, given the large number of themes the indicators cover. The analysis is based on environmental, social, service reliability, user satisfaction, financial and economic performance related criteria.

Population density indicator



Eau de Paris feedback

ASSESSMENT

Eau de Paris has participated in VEWIN benchmarking since the 2006 annual report.

The analysis only dealt with the production and transport scope until recently. However, most participants contributed to the analysis of the complete scope (production and distribution). That is why the first reports were key in rendering the data reliable. Indeed, the comparison with other water services necessitates the adaptation of the results (most notably financial) to a common scope, in other words, the production of drinking water. The first step thus involved disassociating all the activities not concerning the production and distribution of drinking water (non-potable water, services provided to a third party). The necessity of a cost accounting system quickly became apparent to be more effective in this domain. This is currently underway within Eau de Paris.

In terms of results, benchmarking revealed a certain consistency over the years in terms of water quality, service reliability (low breakage in the conveyance network), and environmental impact (electricity consumption). In fact, these results turned out to be among the best of the compared water utilities.

EDP (green line) in electricity use per m³ of water produced (KWh/1000 m³).

Over and above the comparative analysis by examination of the indicators, the data reporting meetings provided a forum for exchange between the different water service companies. These meetings were an opportunity to learn from other services' experience and to share best practices.

These periods of exchange also allowed companies to see, depending on the water company and the country, where they stood with respect to the deployment of new technological advances. Remote meter reading systems that are now used in Paris were, for example, among the important innovations that few water companies have adopted and for which we were able to provide more information.

FUTURE TRENDS

The year 2011 was marked by the integration of distribution data following the creation of a single operator on the 1st of January 2010. An analysis of the data has prompted reflection on the rates of pipe renewal and rehabilitation. Furthermore, this annual report has led to a first comparative analysis of Eau de Paris's data before and after the creation of a single operator.
Also, in this context of major reorganization, comparisons with other water services of a similar operational size over several years will enable us to establish points of reference and to quickly identify significant dysfunctions.
The challenges of new services (both in terms of finances and number of workers) in the new organization could, in fact, be compared to those of our European neighbors.
Thus, new objectives based on the results of other water services will likely be implemented.

Conclusion

To ensure effectiveness, participation in benchmarking requires enormous rigor in the formulation of indicators. The data must be as reliable and accurate as possible to ensure the results are not completely off the mark.

An indicator without a geographic or socio-economic context is often insufficient to ensure a fair analysis. It is thus imperative that the results be accompanied by context indicators that assist in the interpretation of the disparities between different utilities. Commentaries are often useful in providing background analyses for these disparities.

Exchanges between water services are also essential to understanding operational differences and they contribute to best practices.

The participation of Eau de Paris in the VEWIN benchmarking process contributed to ensuring the reliability of the indicator calculation process in this context, and to assessing the performance of the water service in terms of production.
Eau de Paris's participation could help it to rapidly identify areas for improvement over the next few years based on the experience of other water services.
Finally, benchmarking has been a source of added motivation in the search for continuous improvement and in the desire to be a leader in the sector.

COMPARATIVE ANALYSIS: A TOOL FOR IMPROVING WATER UTILITIES PERFORMANCE

Charlotte Bougaux-Ginsburger[1]
& Michel Desmars[2]

KEY WORDS: benchmarking, indicator, transparency, governance, public services

The decree and order of 2nd May 2007 made the annual calculation of some thirty performance indicators mandatory for all public water supply and wastewater treatment utilities in France. These regulatory provisions were a first step forward in performance assessment in the water utility sector. Much remains to be done however to improve practices - still very recent - and, above all, to enhance the value of performance assessment results.

It is difficult for performance to be improved in isolated communities which lack benchmarks. Improvement can only be achieved after knowledge and experience have been shared by a group of communities working together on methods for calculating indicators and differences observed.

In 2009, the FNCCR initiated a comparative analysis approach with the support of proactive communities. This initiative, the first of its kind in France, was in response to a need to improve both the governance and operation of public utilities.

Participants representative of the diversity of water and wastewater utilities

In 2009, 31 communities took part in the first session of the drinking water utilities analysis. Twenty-six of them took part again in 2010 and another 20 joined in. This group of 46 drinking water utilities reflects the diversity that is characteristic of the French drinking water utilities:

- several small utilities supplying a few thousand inhabitants (the smallest supplies 4600 inhabitants), as well as large utilities (supplying up to more than 4 million inhabitants);
- 15 primarily rural utilities, 19 primarily urban, and 12 "mixed" or "semi-urban" (often groups with urban centres and more rural outskirts);
- 25 in public-owned, 16 delegated-management utilities, and 5 with "mixed" management (groups which include areas using different management methods).

In 2010, the FNCCR also initiated a comparative analysis of municipal wastewater treatment services with the support of 34 proactive utilities.

A comparative analysis approach inspired by European benchmarking and incorporating French regulations

The comparative analysis organised by the FNCCR comprises six main steps: choice of the model and indicators, collection and validation of data, analysis of data, writing of reports, discussion of results with the participants, and revision of the model.

The model used for the comparative analysis of drinking water utilities is inspired by the work of the EBC (European Benchmarking Cooperation). It comprises 6 areas of performance, linked to utility activities. Fifty performance indicators (15 regulatory indicators, the other 35 inspired by the work of the IWA – International Water Association) are used to assess the utilities' performance in the six key areas chosen:

- water quality (compliance with microbiological and physical-chemical parameters, progress made with resource protection measures);
- service to users (unscheduled interruptions, written complaints, time for the connection of new consumers, communication, means of payment);
- knowledge and asset management (ad hoc index, percentage of water losses, distribution of system breakage and

1_ FNCCR – 20 Boulevard Latour-Maubourg - 75007 PARIS - c.ginsburger@fnccr.asso.fr
FNCCR is a federation of local authorities, responsible for water and wastewater among other public services.
2_ FNCCR – 20 Boulevard Latour-Maubourg - 75007 PARIS - m.desmars@fnccr.asso.fr

connections, system renewal);
- secured supply (single-resource consumers, storage autonomy);
- relations with the environment (electricity consumption, undistributed, unbilled water);
- economic and financial aspects (tariffs, debt, self-financing, investment level, operating expenses, outstanding payments, loan charge-offs, cooperation and solidarity actions).

The performance of the different utilities may only be compared in accordance with the environments in which they operate. Some twenty contextual indicators were therefore added to the model: data related to population, consumption, system characteristics, type of resources, treatment, etc.

A similar model was established for the comparative analysis of wastewater treatment utilities. It consists of 5 areas of performance (collection and treatment efficiency, service to users, knowledge and asset management, relations with the environment, economic and financial aspects), and comprises 49 performance indicators (including the 15 regulatory ones) and contextual information.

Performance assessment calls for an excellent mastery of the indicators

Calculating performance indicators is not enough in order for water supply and wastewater treatment utility performance to be correctly assessed. The reliability of the data used and of the calculations must be ensured and factors liable to impact the values obtained must be known. It is also necessary to be capable of combining indicators in order to interpret them.

For example, French regulations include three performance indicators for measuring the results of drinking water system asset management: efficiency, water losses per km of mains, and unmetered volumes per km of mains. The meanings of the first two are plainly different. Efficiency is the ratio between volumes consumed/sold and volumes produced/purchased, whereas losses per km of mains is the ratio between the volume of leakage and the length of the mains. Efficiency varies according to leakage and also the level of consumption. Water losses per km of mains is a more direct translation of the leakage ratio and hence the state of the mains. In the two graphs below, the utilities are presented in the same order, but the assessments of the results differ considerably for some of them according to the indicator used. This clearly illustrates the fact that efficiency and losses per km of mains measure performance in relation to very different objectives.

Figure 1: Water losses per km of mains index for 2008 and 2009 according to urbanisation of communities

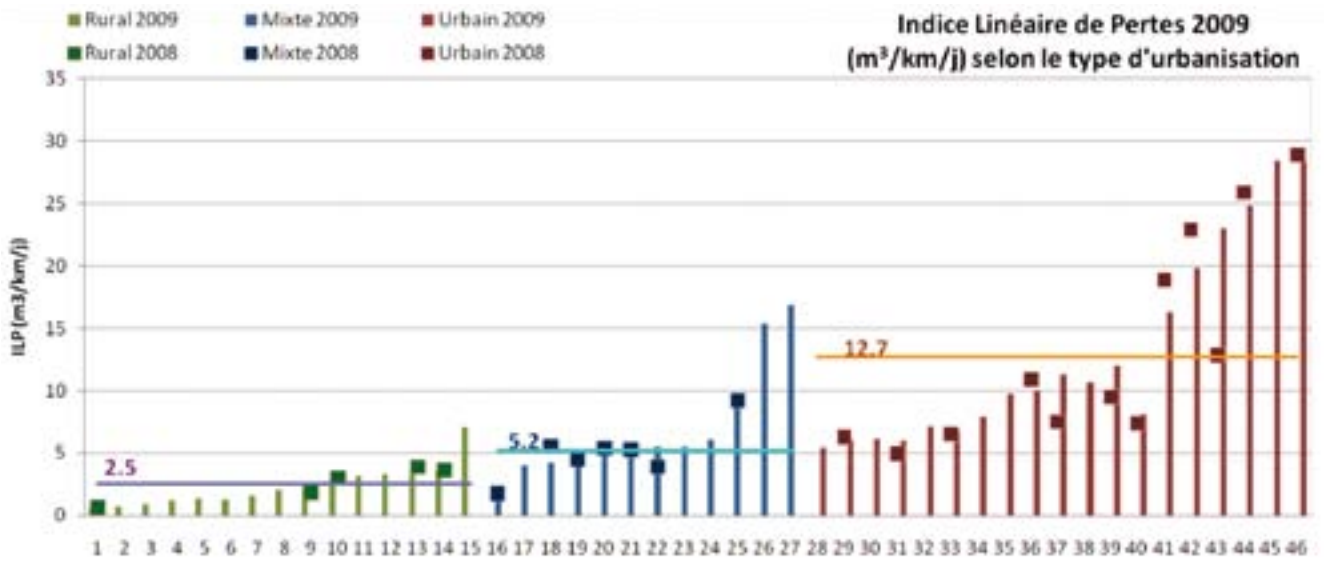
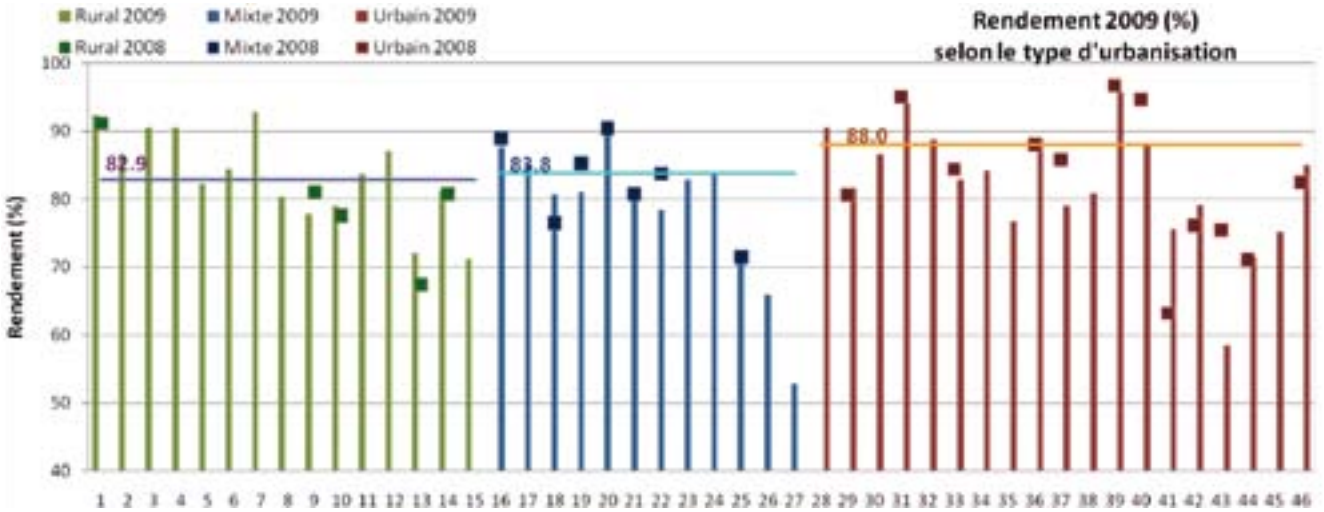


Figure 2: Mains efficiency for 2008 and 2009 according to urbanisation of communities



If the aim is to present an infrastructure water balance, efficiency is used; if it is to characterise infrastructure "tightness", losses per km of mains is used.

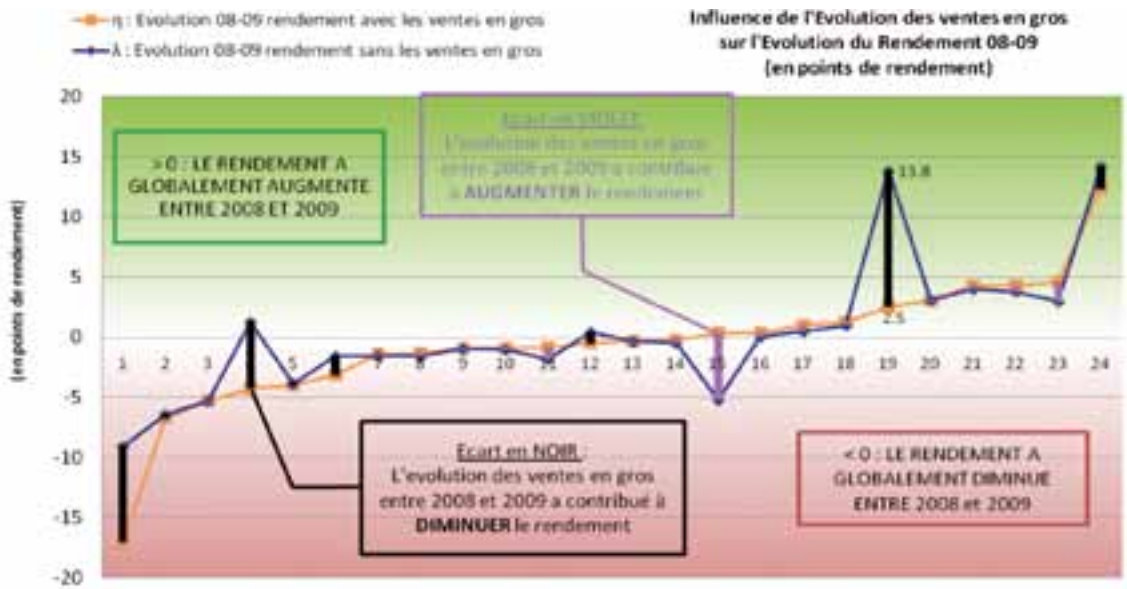
In order to evolve toward benchmarking of the utilities of different communities, a factor that must not be overlooked is the level of urbanisation of the areas covered by the utilities, on which system performance indicators clearly depend.

Multi-year analysis guarantees better performance assessment

Performance indicators calculated for a single period (a single year) do not enable the performance of water supply or wastewater treatment utilities to be assessed accurately and precisely. For one, exceptional events, specific to the period, can affect the results and, secondly, it is difficult to grasp – in a single period – the impact on results of specific local factors, of which there are often many.

For example, the impact on efficiency of water consumption trends has been studied in the framework of the FNCCR's comparative analysis. It showed that, in some cases, the reduction of wholesale water distribution (to outside communities or industry) results in a decline in efficiency by several percentage points, even though performance of the infrastructure, in reality, has not changed (volume of losses constant) (see Figure 3 below).

Figure 3: Influence of wholesale water distribution on trend in efficiency between 2008 and 2009



Similarly, the building of a new wastewater treatment facility can have a strong impact on the facility's performance compliance during the start-up period, as well as on the perception of the wastewater utility's future investment capacity, which drops sharply after the construction project. Or else, a period of rigorous frost linked to a much colder than average winter can significantly increase breakage in some systems and give the impression of a decline in the utility's performance, whereas this is simply a cyclical event.

Our analyses have highlighted that efficiency and most performance indicators are very sensitive to the evolution of base data (length of mains, consumption, population, etc.) and that conclusions on utilities' performance drawn from a single year of operation are generally not very accurate.

It appears essential to have a set of data on several years in order for performance analysis and utility management improvement recommendations to be reliable. Even if a period of two years of data allows some conclusions to be drawn (see section above), a range of 3, or even 5 years, undoubtedly appears to be more robust and allows performance indicators to be calculated as running multi-year averages. Since the FNCCR's comparative analysis has only been in effect for two years, it has not yet been possible to materialise this approach.

Performance improvement means sharing knowledge

In the individualised reports transmitted to the utilities participating in the comparative analysis, the FNCCR suggests options according to the performance levels observed for the different indicators as well as actions. However, it is obvious that the sharing of knowledge and experience in work group meetings is in itself a performance improvement factor for the participating utilities, in two respects:

- Improvement of the reliability and comparability of indicators (through convergence of data calculation methods), which can improve benchmarking.
  Discussions during the first drinking water utility comparative analysis session highlighted the fact that the utilities did not all interpret the variables and indicator calculation methods in the same way, despite the existence of explanatory data sheets provided by the ONEMA. For example, the number of unscheduled service interruptions (water cuts) is seldom interpreted consistently by the different utilities. The interruptions counted may include those linked to incidents on the mains only, or on branch connections (with possible distinctions according to whether the incident occurs in the public section or the private section, or according to the number of consumers affected). For the years that followed, the pooling of calculation methods resulted in the specification of particular definition points and thereby in improving comparison between utilities.
- Learning of utilities' best practices and the possibility of adapting them in other utilities to fit local contexts.
  The sharing of experience during work meetings reveals good or even best practices within the group, which may fuel the improvement of management by other utilities. For example, some utilities became aware that the service connection times to which they committed with their consumers were more than 8 times longer than the connection times set by the large majority of utilities in the sample.

In conclusion, the result of the two comparative analysis sessions carried out by the FNCCR is that performance measurement and assessment are becoming a must in order to respond to water supply and wastewater treatment users' demands and also, and above all, to optimise the utilities' knowledge and operation. However, the above-mentioned improvement objective can only be achieved, at least partially, after a period of several years of benchmarking, which makes the data collection process reliable and does away as much as possible with the cyclical effects that can skew the analyses

BENCHMARK (COMPARATIVE ANALYSIS) FOR THE SUPPLY OF WATER AND SANITATION SERVICES TO DISADVANTAGED POPULATIONS: **EMERGENCE OF A FRAMEWORK OF INDICATORS**

{ Marteen W. Blokland[1]

KEY WORDS: development, political evaluation, incitation, contextual parameters, benchmark

When the United Nations adopted the Millenium Development Goals (MDG) in 2000, they gave an enormous boost to the eradication of poverty, by quantifying the goals and targets to be reached by 2015. There exist in particular specific objectives for the improvement in the coverage of the water and sanitation utilities. The WHO and UNICEF "Joint Monitoring Programme" (JMP) confirm that the extension of the water utility is generally well on the way to reaching the goals, whereas sanitation has fallen behind, well behind. It should be noted that those people who are badly serviced are in the large majority disadvantaged and poor people from the urban and rural areas of developing countries, more particularly in Asia and sub-Saharan Africa.

Benchmarking "consists in fixing the goals to be reached by taking examples of objective external standards, by drawing lessons from the experiences of others and especially by taking an interest in the way in which they have done things rather than in the scale of their achievements". The comparative analyses consist in two distinct phases or stages, a comparative evaluation of the results, followed by an improvement in the results, when the best practices which provided the inspiration have been adapted and incorporated into the operations of the undertaking.

The PROBE research project

The aim of the PROBE research project is to propose improvements to existing comparative analysis (benchmarking) tools so as to enable the players involved in the supply of public utilities to concentrate much more on the access of disadvantaged urban populations. This research project is currently being implemented in five countries. Eight academic institutions and nine professional institutions are taking part in it, among which some operators and regulators[2]. The research work is carried out by Master's degree and PHD students.

The question of access to water and sanitation for the disadvantaged populations is not new in itself. The research work carried out over several decades has shown that the provision of sustainable utilities to disadvantaged urban populations requires the public utility players to develop an integrated approach. An approach involving the specific consideration of the question of the servicing of the most disadvantaged or those living in sectors without any official existence, to make technological choices adapted to these situations, to deal with the problems of accessibility to financing and finally conclude effective and innovative institutional agreements.

In the conception of the project PROBE, while this multitude of players and factors form the ingredients necessary for the success of access to the essential utilities, they should then be incorporated into an overall system of benchmarks. Only a system developed according to this principle will be effectively in a position to assess whether in a particular urban environment, all the necessary institutions, organisations, systems and procedures exist and provide a favourable context to enable the disadvantaged populations to be supplied with water and sanitation. Added to these variables which should measure whether this context is favourable to the procurement of water

1_ M.W. Blokland, UNESCO-IHE for Water Education, Westvest 7, 2611 AX Delft, Netherlands (e-mail: m.blokland@unesco-ihe.org)

2_ Academic partners: UNESCO-IHE (Netherlands), USP and UFC (Brazil), KNUST (Ghana), University Makerere (Uganda), University of Zambia (Zambia), PWUT (Iran), CEPT (India). Professional partners: SABESP, ARSESP, ARCE (Brazil), NWSC (Uganda), NWASCO (Zambia), NWWEC (Iran), IWA and Vewin (Netherlands), SUEZ ENVIRONNEMENT (France).

and sanitation to the disadvantaged districts, the project PROBE would like to include reference indicators which assess the real quality of these services supplied to the inhabitants of the shanty towns and the informal districts.

Finally, beyond the creation of an *evaluation* system to determine whether the authorities are prepared and capable of supplying these services and compliant with the concept of benchmarking (of the operators), the project PROBE aims to develop a system for improving performances so as promote the optimisation of all services intended for the disadvantaged populations through the exchange of best practices in the fields concerned.

Hence, the following subjects for study were defined:

- The development of a system of indicators dedicated to the sustainable provision of utilities for the procurement of drinking water and sanitation to disadvantaged urban populations;
- The identification of systems of incentives which aim to accelerate the introduction of these utilities to these populations;
- The development a low-cost methodologies to characterise and map the populations concerned;
- The identification and categorisation of the best practises which provide an improvement in the access to the utilities;
- The creation of a tool-box which gathers indicators specific to the disadvantaged populations, the incentive mechanisms which encourage their service, mapping tools, case studies and practical tools which enable these utilities to be supplied to the most disadvantaged.

The results of the research

The initial work covered the development of indicators, incentive systems and best practises. A study of projects in favour of disadvantaged populations carried out with success, concluded that the 5 key players are the municipality, the users, the supra-municipal intervening parties, the NGOs and community organisations and the operator. In the same way, the 5 predominant factors are the financial mechanisms, governance, the involvement and participation of the users, technology and the institutional and legal mechanisms.

Then, the project took an interest in those indicators which concern the supply of utilities to the disadvantaged populations. It was stressed that those used in common within the benchmarking of the operators was not particularly appropriate for the definition of the progress made in the access of disadvantaged people to improved services. The author proposed an initial series of five issues and thirteen indicators (see Table 1) which would provided a better characterisation of the contribution of these services to the disadvantaged districts.

Table 1. Framework for the evaluation of the supply of utilities to the disadvantaged populations

Issues	Indicators	
Policies and capacity	1	Political initiative and support
	2	Capacityof the regulator
	3	Capacity of the operator
Collaboration	4	Collaboration between the different organisations
	5	Involvement and participation of users
Tools	6	Mapping of disadvantaged populations
	7	Adapted financial instruments
	8	Adapted technologies
	9	Incentive measures in favour of disadvantaged populations
Sustainability	10	Innovation and apprenticeship
	11	Sustainability
Supply of services	12	Quality of the sanitation utility supplied to disadvantaged districts
	13	Quality of water utility supplied to disadvantaged districts

The following research was used to refine the context by developing the content of each evaluation domain, by proposing data collection methodologies, by developing a system of grading so as to evaluate the field data and by testing this system in a real situation.

To obtain a more detailed definition of the indicators, they all had be broken down into sub-themes, themselves divided into criteria. These sub-themes and criteria were drawn from the best practices and had to correspond wherever possible to a certain simplicity and facility in their implementation.

The 13 indicators could be split into two groups: indicators 1 to 11 concern contextual (qualitative) parameters whereas indicators 12 and 13 concern the effective quality of the services provided to the disadvantaged populations (quantitative).

If we take as an example, indicator 1: political initiative and support. It has been broken down into 6 sub-themes:

- The water-sanitation policy in favour of the disadvantaged populations;
- The water-sanitation legislation and/or regulations in favour of disadvantaged populations;
- The specific objectives and programmes for the provision of water and sanitation utilities to disadvantaged populations;
- The financial aid from central/local government targeting the water and sanitation utilities;
- The specific organisational dispositions existing at central/local government level for the provision of water and sanitation utilities to disadvantaged populations;
- The initiatives of governments to enable stakeholders to become involved in the question of water and sanitation utilities.

For the sub-theme i) the policy in favour of the disadvantaged populations, there are four evaluation criteria: a) the policy gives specific priority to the provision of services intended for disadvantaged persons, b) the policy has a component concerning the water and sanitation utilities for disadvantaged people, c) the policy has components concerning the involvement of the community and the equality of the sexes and d) the policy comprises financial mechanisms concerning the provision of water and sanitation utilities for disadvantaged people.

In total, the 13 indicators are composed of 33 sub-themes and 97 criteria.

The system presented above has been tested in the field in several shanty towns and informal districts. The results obtained in this way were then used to quantify the indicators. The system, which was tested for the quantification of the qualitative indicators, studied the proof collected for each element. Let us take the example of the policy in favour of poor populations: in the event of a policy existing, the note obtained is 0. If there is one, the following step consists in assessing the quality of this policy thanks to the criteria defined previously, which will produce a result which may vary from 1 (= limited or bad quality) to, for example, 4 (= good or excellent quality).

The same method was applied to the indicators producing quantitative results, notably the indicators 12 and 13. The results were compared to a reference point (arbitrary) with the aim of obtaining here a note of 0 or 1, a note of 0 indicating a lower performance to the reference point and a note of 1 a higher performance.
For example, for the distance to be covered to reach a water point, the reference value was fixed at 50m. If in the district studied, the distance is lower, then the note attributed will be 1. In the opposite case, it will be 0.
By adding the notes obtained for each of the indicators we obtain an overall evaluation of the context and the effective quality of the services in the poor districts (Table 5). The strong points and weak points may then subsequently be subjected to a comparative analysis with other references in other cities or other countries, then of the improvement thanks to the results of the benchmarking.

Another more direct use of the evaluation would consist in looking for the cause and effect relationships which may explain the differences in quality between the water and sanitation utilities of several disadvantaged districts. The differences in service quality of the same district may not be explained by the result of the evaluation alone. Similarly, the proposed context does not systematically explain the causal link between the context and real quality of the service in the districts. This means that the context of the indicators defined does not manage to take into account all the aspects which influence the quality of the water and sanitation utilities. This is for example the case of the question of the socio-political dynamics which however play an important role within disadvantaged districts.

The different methods for gathering the data used in the research have enabled the triangulation and confirmation of the information. However, a certain amount of secondary information proved to be impossible to compare with the data coming from observations in the field. In this respect, the question of the subjectivity of certain data was posed and the factors linked to the interpretation had to be eliminated.

Conclusion

The novel aspect of this research resides in the fact that while based upon the regular benchmarking of the operators, it puts the accent on the disadvantaged populations and does not content itself solely in measuring the performance of the water and sanitation utilities, but also proposes to measure the progress made in the policies or incentives or in the disposition of the stakeholders to commit themselves in favour of these populations. These latter elements in fact being considered as indispensible components of the success of the supply of drinking water and sanitation to disadvantaged urban populations.
The introduction of this framework is in progress and current research shows that too much importance has been given to certain indicators, while others should be added. Similarly, certain elements may need to be modified. The system for the evaluation and the rating of the context indicators is viable, but it will need to be perfected. The expected correlation between these context indicators and the performance indicators, which measure the real quality of the utilities in the disadvantaged urban districts is not satisfactory in their current state, which is confirmed by the need to improve the series of indicators proposed initially.

THE PERFORMANCE ASSESSMENT SYSTEM (PAS) PROJECT IN INDIA

Meera Mehta[1]
& Dinesh Mehta[1]

KEY WORDS: performance indicator, performance measurement, monitoring, appropriation, equal access to service

Background and context

India has demonstrated significant progress in improving access to basic water and sanitation services. With 96% of urban population having access to basic water supply in urban areas in 2008, India is close to providing "water to all". However, a few anomalies stand out. First, access to improved level of services (i.e. house level connections) has actually worsened from 52% in 1990 to 48% in 2008. The water supply in Indian cities lasts on average one to two hours and is usually not metered. For sanitation, the situation is quite serious with access to safe basic sanitation available to 54% of the population in 2008, while 21% had access to only shared facilities. An estimated 18% of urban population resorts to open defecation[2]. While the focus in India is on infrastructure investments, performance on service delivery measures, like hours, and reliability of supply and financial sustainability is very poor. Transforming infrastructure creation to delivery of good quality services remains a key issue.

Service level assessment through key performance indicators has become a standard practice in the water sector in many countries. Over the past two decades, there have been a number of efforts to develop and standardise the approach to benchmarking in the water sector. Notable among them are the efforts of the International Benchmarking Network for Water and Sanitation Utilities (IBNET), American Water Works Association (AWWA) and the International Water Association (IWA). A recent publication focuses more on the benchmarking process with an aim to evolve a common language and a common approach and framework for developing and implementing benchmarking programmes. This publication is co-published by IWA and AWWA suggesting an agreement among the two most influential organizations in the sector[3]. During this period, the work on benchmarking has also helped to define the international standards for assessment of drinking water and waste water services and management of utilities and the services to users through various ISO documents[4].

While the approach to these publications has been general and applicable to any situation, in practice, these have been more oriented to the developed world context. The scope of these manuals has focused more on networked systems for water supply and waste water services, generally with autonomous utilities as service providers. Often, this has meant limiting the assessment to existing utility clients. This approach differs from the reality in many countries in the developing regions. For example, it is common in many developing countries to find local governments, rather than autonomous utilities, as service providers. Further, a large proportion of cities in developing countries do not have networked services, particularly for waste water. The second key aspect relates to equity in access and quality of services across various groups in cities. Unlike in developed countries, there are significant variations in access and in quality of services in slum areas.

Performance Assessment System (PAS) Project

There have been very few studies on performance assessment in the water and sanitation sector in India. Unlike the international experience, these studies have been conducted in a few pilot cities as 'one-off' exercises. A recent Government of India initiative to develop Service Level Benchmarks (SLB) has created some interest among utilities. It is in this context that the

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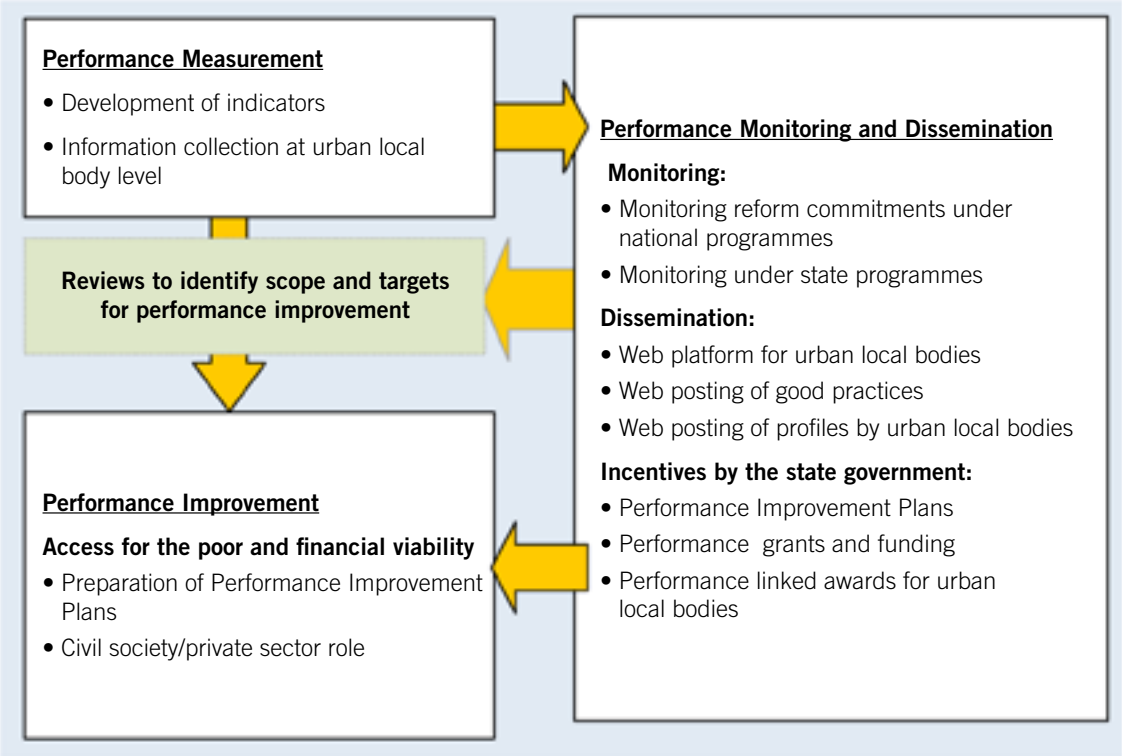
3_ Cabrera E., P. Dane, S. Haskins, H. Theuretzbacher-Fritz. (2011). Benchmarking Water Services – Guiding water utilities to excellence. Manual of Best Practice. IWA Publishing, London, UK.

4_ ISO 24510:2007. Activities Relating to Drinking Water and Wastewater Services - Guidelines for the Assessment and for the Improvement of the Service to Users; ISO 24511:2007. Activities Relating to Drinking Water and Wastewater Services - Guidelines for the Management of Wastewater Utilities and for the Assessment of Wastewater Services; ISO 24512:2007. Activities Relating to Drinking Water and Wastewater Services - Guidelines for the Management of Drinking Water Utilities and for the Assessment of Drinking Water Services.



CEPT University is implementing an action research project for the development of Performance Assessment Systems (PAS) for urban water and sanitation. The project is implemented in more than 400 cities in two states (Gujarat and Maharashtra) in India. In both these states, water and sanitation services are provided by municipal governments.

The Performance Measurement Framework used for the project has three key components of performance measurement, monitoring and improvement. In addition to the usual performance indicators, the PAS project has developed key indicators for measuring equity in service delivery. Two aspects of equity are important for delivery of water supply and sanitation services in Indian cities. One relates to access of services to the poor who reside in slums and the second aspect relates to non-networked systems in waste water. Additional indicators have been developed to capture policy level constraints in providing services to slum settlements. The framework for equity assessment covers the enabling environment, local preparedness and service delivery aspects related to slum settlements. Under enabling environment, parameters such as presence of policy provision in slums, and efforts to include non-notified (undeclared) slums are assessed.

Sanitation as a system consists of elements such as capture, collection, transportation, and treatment of waste. Toilets are the primary element in the sanitation system. While current indicators focus on measuring access to toilets (individual or shared by community), indicators are also needed to measure collection, transportation and treatment systems in non-network situations. PAS project has developed indicators that measure transport and disposal of grey water and fecal sludge. In absence of sewered networks, sludge from septic tanks is emptied using suction emptiers/trucks at varying intervals depending on the size of the collection system and transported to a treatment or disposal site.

Implementing PAS

The PAS project has been implemented in 414 cities in two states of India for the past two years. The framework for Performance Measurement was tested in a few cities and had to be adapted to the Government of India's service level benchmarking framework. However, many missing indicators on equity and non-networked systems had to be added (see PAS (2008), Performance Measurement Framework for Urban Water and Sanitation)[5]. The collection of information from the city governments was a major challenge. The first task was to create awareness among utilities about performance assessment. Given the state of record keeping in the Urban Local Bodies (ULBs), which provide water and sanitation services, personal visit of PAS teams were made to all the ULBs in Gujarat. In Maharashtra state, data workshops were held where ULB staff interacted with experts in filling up the data checklist. The results for the first round of KPIs are available on the PAS website (www.pas.org.in) and also published in a report[6].

In addition to generating PIs, the PAS project also conducted household surveys to assess consumer perceptions. The

5_ Available at http://pas.org.in/Portal/document/ResourcesFiles/pdfs/Performance_Measurement_Framework_Report

6_ See "Performance Benchmarking of Urban Water and Sanitation: a Data Book" (2008-9); available at http://pas.org.in/web/ceptpas/resources

analysis was done for different city sizes and by slum and non-slum households. The project also examined financing and monitoring mechanisms in the state of Gujarat. Monitoring of PIs is envisaged through a state level cell established by the state government with support of PAS team. Various reports have been generated from the information collected in the past two years[7]. An online module has been developed for use in subsequent rounds. Utilities will be trained to upload data on the server and a unit within the state government is expected to coordinate the activity with support from the PAS team.

A key to performance assessment is the use of indicators for performance improvements. The PAS team has worked closely with over 15 utilities in Maharashtra on developing performance improvement plans. These plans have focused on improving access to sanitation and increasing the duration of supply of water. PAS team has developed software to help identify actions for improving performance and assess its financial viability. This software is being tested in the 15 cities in Maharashtra.

Key Lessons

While there are many issues related to measurement of performance in an emerging economy context, the PAS experience suggests that it is important to begin with what is available and then improve the measurement over the years. One could spend years in perfecting measurement in a few pilot cities, but then it is difficult to replicate this for all the cities. Instead, it is important to start the benchmarking exercise at a scale involving as many utilities as possible, by developing a system that uses the existing information with utilities. It is only with an exercise undertaken at a large scale that benchmarking can make real impacts on policies and on service delivery.

The second important lesson is that benchmarking exercises in developing country context requires strong government support. Unlike in Europe and North America, where benchmarking exercises are carried out by utilities associations, in India it has been initiated with support of the national and state government. As an incentive to local governments, the national government has also linked a performance grant to benchmarking.

The third lesson is that performance assessment should not be viewed as a data collection exercise. The cities need to understand how such information can help them improve performance. The PAS project team is now devoting considerable time and effort in developing appropriate frameworks and modules to help cities use the benchmarking information and develop action plans. As suggested earlier, the PAS team has developed frameworks and softwares for the state and local governments to take up performance improvement programmes.

The key lesson learnt is to ensure that benchmarking should be “owned” by the utility (Urban Local Governments in case of India) and not ‘enforced’ by a regulator or state government. The ownership at local level will come only when it can be demonstrated that benchmarking leads to better service delivery and improved efficiency. It will then become a part of the routine administration at the state and local level and will be sustainable.

7_ See www.pas.org.in for details on the project and its various outputs

PARTNERSHIPS BETWEEN OPERATORS AS A MEANS TO **IMPROVE PERFORMANCE**

Cassilde Brenière[1]
Martin Parent[1]
Faraj El Awar[2]
Marc Vezinat[3]

KEY WORDS: building capacity, exchange of practices, decentralized cooperation

One of the priorities of the UN's Millennium Development Goals is access to water and basic sanitation. Significant investments will be required to meet this goal in developing countries.

The long-term sustainability of the investments will depend on the existence of an operator with an efficient organization and essential technical and managerial skills, and whose financial means will largely be derived from the billing water users.

Partnerships between operators: a pertinent tool for capacity building for Southern operators

For the French Development Agency (AFD), capacity building is an entirely separate type of intervention, an indispensable complement to the financing of infrastructures. It is one of the condition France stipulates for success. The capacity building of a water and sanitation operator involves not just the individual skills of its personnel and the equipment and the tools it depends on, but also, and more importantly, the efficiency of its organization. It is a process of voluntary change that is based on an assessment of the current state of the organization, a vision for the future, and the clear will of all the stakeholders, starting first and foremost with the executive director.

The opportunity to acquire an in-depth understanding of the operations of another water service operator, to benefit from its successes (development of solutions to specific constraints), compare results, and tangibly assess its resources and tools, provides real leverage for change that is far more effective than the same advice handed out by a technical consultant: advice from a peer often has more weight than that of an expert[4].
Partnerships between water and sanitation service operators constitute a means of capacity-building worthy of development.

UN-Habitat - GWOPA: an enabling framework for Water Operator Partnerships (WOP)

With the impetus of the United Nations Secretary General's Advisory Board on water and sanitation (UNSGAB), UN-Habitat created GWOPA, a network intended to promote partnerships between water and sanitation operators in 2007. GWOPA's missions are: 1) to assist in formalizing partnerships between operators by providing a framework, rules and opportunities for networking, 2) to capitalize on the experience of WOPs to highlight successful partnerships, 3) to provide training in methods to share technical know-how, 4) to assist in finding financial support, 5) to help in the self-assessment and benchmarking of African operators.

AFD supports UN Habitat in this undertaking to promote the creation of this type of partnership in connection with the projects it finances, and it encourages the participation of other French players. Other donors, most notably the European Union, which contribute also to this fund, are also committed to this approach.

In this context, 134 African operators participated in a self-assessment exercise designed to identify their strengths and weaknesses, as well as potential consultant partners. These results were presented during a pan-African workshop in Johannesburg, and then in three sub-regional workshops in Dakar, Kampala, and Maseru. Over 50 operators attended each of the workshops. They defined the most critical areas of work requiring transfers of know-how between operators:

- Information systems
- Service to disadvantaged neighborhoods
- Medium- and long-term planning
- Management of human resources and skills
- Heritage asset management

1_ French Development Agency
2_ UN Habitat
3_ SEDIF
4_ The presence of a resident expert within a "recipient" water company is a decisive factor for the success of the partnership, by helping to prepare exchanges with the partner upstream, and by accompanying then ensuring the value of these exchanges.

- Client management
- Non-revenue water

Six regional platforms of exchange between operators are currently operational:

- The African platform, which has enabled the creation of 30 partnerships
- The Latin American platform, supported by the Inter-American Development Bank (IDB), which already has a list of 15 operational partnerships and has identified another 50 potential partnerships
- The Asian Waterlinks platform, supported by the Asian Development Bank (ADB) and USAID, has been active for many years and has facilitated many partnerships between Southern countries
- The Arab platform, which, though just recently formed, has already facilitated one partnership with the support of the German enterprise for sustainable development GIZ
- The recently created Caribbean and South-East European platforms.

In order to earn the "WOP" label, the partnerships must meet certain integrity and transparency criteria, have a capacity building goal and maintain a non-profit status.

In addition to its role as facilitator, GWOPA organizes training and produces summaries of exchanges with the support of the International Water Association (IWA).

GWOPA's internet site enables operators interested in forming a partnership to register, and it highlights the value of existing partnerships by sharing their experiences.

The involvement of French stakeholders in decentralized cooperation efforts

A summary of French involvement in decentralized cooperation in the water and sanitation sector[5] shows that major French operators like the *Agences de l'Eau*, the *Syndicat des Eaux d'Ile de France* (SEDIF), the *Grand Lyon*, the city of Paris or the *Syndicat d'assainissement de l'agglomération de Paris* (SIAAP) have mobilized their expertise to assist operators in Southern countries. They often provide oversight assistance in construction projects.

The French Oudin-Santini law allows 1% of water revenues to be allocated to decentralized cooperation efforts. The financial potential of this measure is 67 million euros per year, of which 24 million was actually invested in 2011. This figure, which has steadily increased since the law was adopted in 2005, corresponds to a contribution of about €0.40 per annum per inhabitant. This source of financing allows to envisage an increasingly greater involvement of French operators and utilities in partnerships between operators.

5_ Summary realized by the Programme Solidarité Eau with the support of the AFD, available on the AFD internet site.

THE TECHNICAL PARTNERSHIP BETWEEN THE VIENTIANE WATER COMPANY AND THE SYNDICAT DES EAUX D'ILE DE FRANCE (SEDIF): AN IDEAL INSTRUMENT FOR CAPACITY BUILDING

The AFD has played an active role for almost 10 years in the reinforcing and development of the Vientiane Water Company (*Nam Papa Nakhone Luang* - NPNL) in the capital of Laos. It has committed to a subsidy of 14.2 million euros to assist in the expansion of the network, established a professional training center for water utility workers, and supported a restructuring plan for the water company. While the investments were completed with satisfaction, the implementation of changes that are essential to improving technical performance and restoring financial stability have yet to be made.

Furthermore, since 2004, under the authority of the *Agence Nationale de Régulation de l'Eau*, the *Syndicat des eaux d'Ile de France* (SEDIF) has co-financed equally with the French Ministry of Foreign Affairs and private Laotian operators several small piped water systems (MIREP) to develop the public water service in eight neighborhoods in the provinces of Vientiane and Bolikhamsay. Developed by the *Groupe de Recherche et d'Échange Technologique* (GRET), it has enabled the creation of a set of tools and promoted expertise in stewardship and in the monitoring and management of public drinking water services. It was in regard to these questions that the SEDIF offered to work together with the NPNL in 2009, which led quite naturally to the current project that AFD is financing.

In conjunction with this collaborative effort, the NPNL expressed a desire to rehabilitate the water supply network in the center of Vientiane, and to develop new systems in two peri-urban neighborhoods. Capacity building is the centerpiece to this partnership, most notably related to the oversight of public service delegation and the reduction of water losses. To this end, the NPNL not only sought contracting authority assistance, provided by GRET, but also the advice of a third party, the SEDIF, with which periodic meetings have driven to the reform process. The GRET has provided two technical assistants, one French and one Laotian, whose costs are shared by the AFD and the SEDIF. These exchanges have taken several forms: a comparative presentation of financial results, the sharing of experiences with other water service companies, and support missions of SEDIF engineers. The AFD has provided support to the NPNL by covering related travel costs.

WIKTI
A KNOWLEDGE TRANSFER METHOD CONTRIBUTING TO IMPROVED PERFORMANCE

Pablo Vizioli[1]

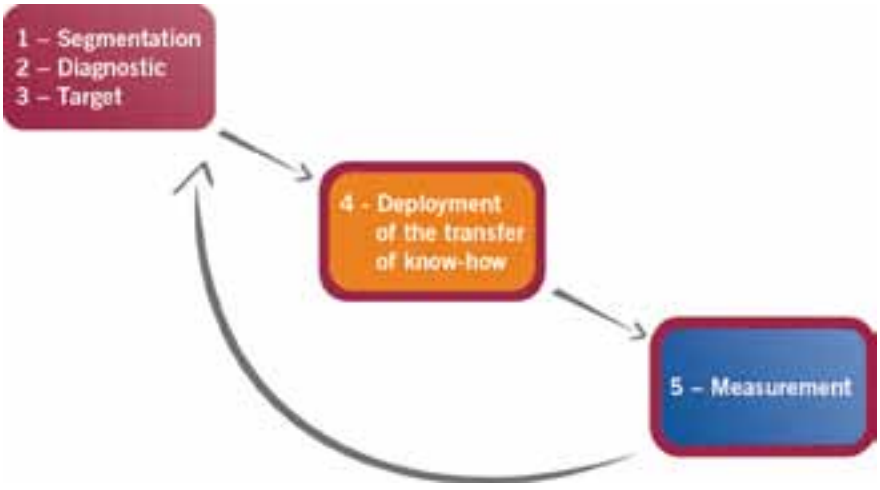
KEY WORDS: performance, knowledge transfer, skills, assessment

Context

SUEZ ENVIRONNEMENT is a world leader exclusively dedicated to water (drinking water and wastewater) and waste management services, with a presence on five continents and in more than 35 countries. Many large cities outside Europe, like Indianapolis, Hong Kong, Algiers, Jakarta, and more recently Melbourne, have entrusted SUEZ ENVIRONNEMENT with the management of all or part of their water, wastewater or waste management services. In conjunction with these activities, the SUEZ ENVIRONNEMENT (SE) Group has implemented an innovative internal method for the transfer of knowledge to its various Business Units: WIKTI (Water International Knowledge Transfer Initiative).

The need for knowledge transfer first arose after the signature of management contracts by the SE Group (the first contract was signed with Algeria), when it became apparent that there was no formalized support procedure for these new types of contracts. This need was addressed via a specific plan to transfer knowledge in order to provide the expertise required to improve the performance of water and wastewater services, raising performance levels to those of an international leader. The Group's Research, Innovation and Performance Department decided to develop a tool that would provide essential support to management contracts like the one signed with the city of Algiers, where the pilot project was launched.

A three phase methodology



1_ Knowledge Management and Transfer manager, SUEZ ENVIRONNEMENT

The WIKTI method

WIKTI is a tailored solution developed by SUEZ ENVIRONNEMENT for knowledge transfer contracts for and performance improvement in its subsidiaries and local drinking water and wastewater treatment companies. WIKTI is a standardized ISO 9001 certified methodology that can be applied to any type of business unit, from a small one wanting to reach a quality standard level, to the most mature operation seeking excellence and leadership. It was developed in conjunction with the management contract signed with the city of Algiers in 2006.

This knowledge transfer methodology is divided into three phases: a diagnostic phase, a deployment phase and a measurement phase.

With WIKTI's diagnostic and performance assessment methods, the company can define specific targets and monitor the project's progress step by step. This unique tool targets operational needs in order to develop tailored solutions that are best suited to meet the company's goals. The transfer of knowledge and the improvements in performance are evident and measurable.

FIRST STEP: SEGMENTATION, DIAGNOSTICS AND TARGET DEFINITION

Segmentation and diagnostics

The first step involves identifying the company's basic operational business processes, which are then positioned in the SE segmentation of 38 business processes clearly identified as water activities. These are divided into four categories: drinking water, wastewater, customer services, and support functions (transversal).

To determine the company's initial status, a level of mastery for each business process is assessed using its own assessment grid. Standardized and objective criteria are defined for each grid on a scale of 1 to 6, corresponding to different mastery levels (level 1: very weak, to level 6: international leader). All the results are plotted on a 360° graph that provides a comprehensive view of the company (see example below). The business processes furthest from the center are those that are best managed (highlighted in blue). The business processes at the center of the graph are those that are least well managed (highlighted in red).

Target definition

The desired level of maturity to be reached by the end of the contract is then defined by the operator with the client. Action plans are drawn up to identify the improvements and steps that will be required to reach the desired result for each assessment criteria and each business process.

Each business process must be analyzed for its importance and criticality within the local context. For a business process critical to the operation of the company, the defined objectives will be higher and knowledge transfer efforts reinforced.

The active involvement of supervisory authorities is a key factor to success and ensures that all observations, decisions and actions are indeed shared by all throughout the duration of the contract.

SECOND STEP: DEPLOYMENT

A Know-How Officer is assigned to each business process and given responsibility for implementing the action plan. The Know-How Officers work in cooperation with the local managers of the various departments.

The selection and the training of a Know-How Officer are important aspects of the knowledge transfer process. Each Know-How Officer receives a "tool kit" that contains the key aspects of SUEZ ENVIRONNEMENT expertise that are pertinent to his or her field of expertise.

The role of Know-How Officers:

- Identify objectives
- Define training needs
- Organize in-house training in their field
- Conduct periodic assessments

Training:

The development of expertise and training are key factors in the success of the knowledge transfer process.

After having divided the water activities into business processes, documented them, and established assessment criteria for each, it is then important to be able to transfer the required skills and apply them.

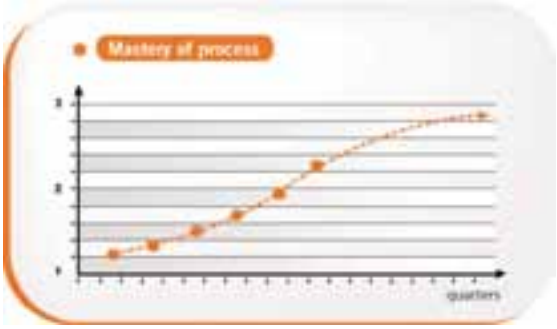
Of all the different vectors of the know-how transfer, training is one of the most important. WIKTI provides training specifically linked to its business process segmentation methodology that is also geared for the right skill level. The training takes place at the Group's training center in France, as well as abroad.

THIRD STEP: MEASUREMENT

Regular assessments are conducted jointly by the Know-How Officers and operational personnel. Much like the initial diagnostic, these are carried out using the evaluation grids in order to measure progress and make adaptations to the action plan, if deemed necessary. The results are shared and approved by the operator, local authorities and local management teams.
Measurements are plotted using monitoring indicators to assess the progress of the knowledge transfer throughout the duration of the contract, both in terms of individual performance with respect to other workers and globally within the business process.
Technical audits are used to quantify improvements in the skills of operational personnel in the Business Unit.

In order to monitor the Know-How Transfer, four indicators are measured:

- **Number of training days** (quarterly total)
- **Mastery of process** (annual measure of the average difference in the criticality/know-how matrix (target to be specified))
- **Qualification or certification of personnel for certified positions within the company** (quarterly total expressed in %)
- **Application level of basic rules** (semi-annual assessment in %, calculated by Know-How Officers), the 5-year target may be 90%



This measurement is a process repeated many times, which, depending on the results, allows for the adaptation of training programs and the knowledge transfers.

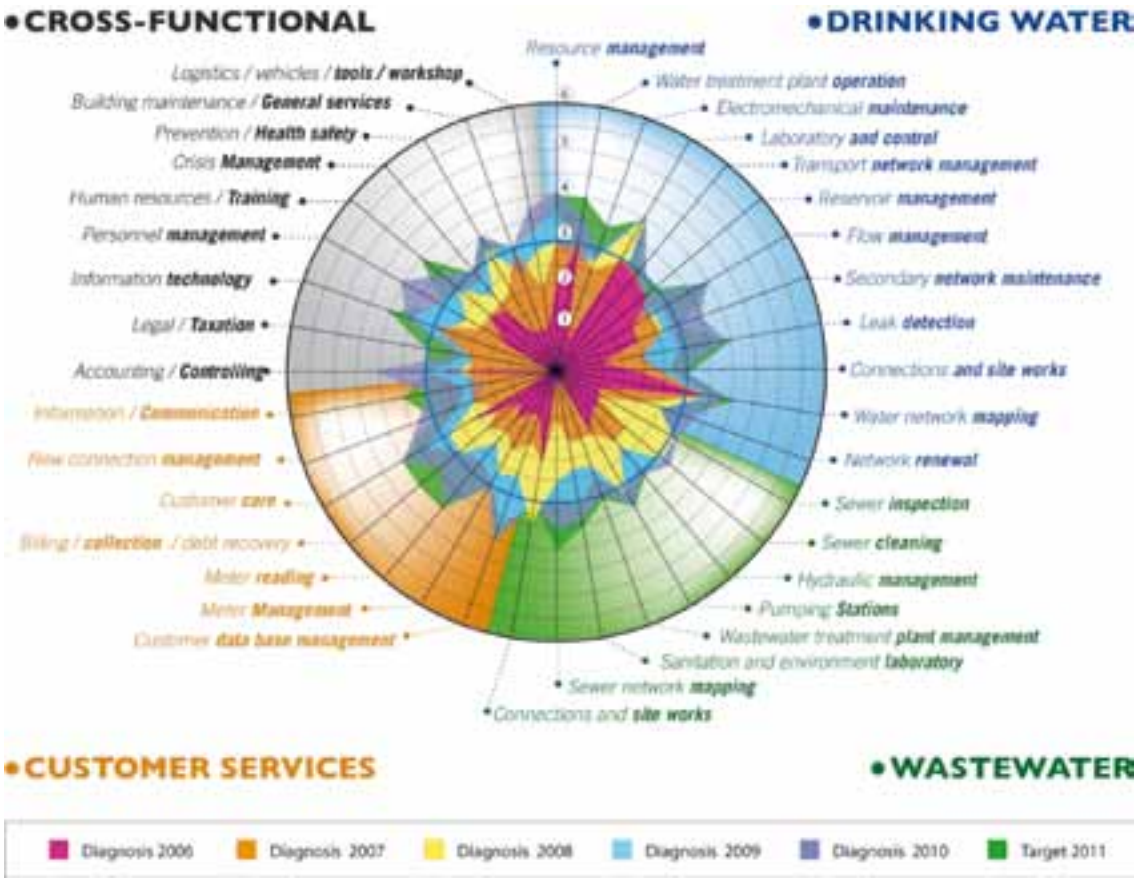
The experience in Algiers

The initial diagnostics at the Algiers water and wastewater company (SEAAL) were completed in 2006, based on the segmentation into 36 business processes (drinking water and wastewater). Subsequently, 36 Know-How Officers (Algerians and expatriate managers) were assigned for the deployment phase.

During a seminar that brought together local authorities, Know-How Officers, SEEAL operational managers and SUEZ ENVIRONNEMENT experts, the targets for the 36 business processes were defined, thus completing the first step in the WIKTI methodology.

Each year, the different stakeholders meet to measure the progress of the knowledge transfer in SEAAL. This provides an opportunity to establish, most notably, an inventory of results that is laid out in the graph below. It shows the skill level achieved in each of the 36 business processes at SEAAL over the last few years, as well as the targets yet to be reached.

This graph provides a visual representation of the efficiency of the Know-How Transfer and of the performance improvements reached in just a few years at SEAAL. These good results were highlighted by the "Global Water Intelligence Award", received in 2011, and applauded as the "Water Performance Initiative of the Year."



EXECUTIVE TRAINING FOR WATER AND WASTEWATER TREATMENT LEADERS FROM EMERGING AND DEVELOPING COUNTRIES

Jean-Antoine Faby[1]

KEY WORDS: leadership, action plan, skill, customized training, change management

Inaugurated in 2009 at the Institut de France initiated and supported by *ParisTech* and the *SUEZ ENVIRONNEMENT Foundation*, the Water for All research and teaching Chair has, since three years, provided innovative professional training to managers of urban drinking water and sanitation departments. The target candidates came from emerging and developing countries. *AgroParisTech* Executive oversees the Chair's activities, and is assisted by *MinesParisTech* in all research activities. The Chair was created to answer a manifest lack of training throughout the world for leaders and managers in this specific sector and in these countries. Indeed, MBA programs and existing training programs, either technical or scientific, are less inclined to prepare students for public service management, whether in northern or southern countries. The Water for All International Executive Master's program, also called OpT, is designed to meet this need. It trains upper management personnel – specifically executives in operational service positions – by putting them in teams and preparing them to manage water services in medium-sized cities (100,000 to 1 million inhabitants) by boosting their management skills. Myriam Bincaille, General Delegate of the Fund SUEZ ENVIRONNEMENT Initiatives, confirms this approach: *"We created this Chair, in partnership with ParisTech because we believe that training and skil transfers are fundamental to develop and sustain water and sanitation services. This is true at all levels, and particulary that of managers."*

Since 2009, two classes have already graduated, and with the 3rd class of 2011-2012, a total of 44 people will have received diplomas from the program. They hail from 25 different countries – mostly African, but also from Asian, Central European and Caribbean nations. Each graduating class is alternatively trained in French (the 1st and 3rd year) or in English (the 2nd year); bilingual training may eventually be offered in the near future.

Leadership development thanks to a tailored training programs

Much like the Touareg saying that *"the difference between a garden and a desert is not the water, but the man,"* the training aims to strengthen their skills in areas of leadership, team mobilization, and change management. Within the context of the program, the executive trainees, who are sent by their companies, will also be able to design a complete action plan on a city scale over the short- or long-term and learn how to deal with the combined effects of an explosive population growth and a dysfunctional public service sector. The first female president of a water utility on the African continent who now holds a high-level position in the *Association des Services d'Eau des Pays Arabes* (ACWUA), Nadia Abdou, (chosen as the Godmother of the second Masters OpT class), confirmed in 2009 the importance of the roles of management and of responsible and effective leadership, by pointing out *"the enormous difficulties associated with making good prioritizations, the hierarchizing of activities, and the meeting of multiple objectives."* This was also the assessment of Ek Sonn Chan, a program contributor and the architect of the spectacular turnaround of Phnom Penh's Water Board which he has headed up for 10 years: *"In my country and in many others, the primary factor in failure is the lack of an executive management that is adequately trained, capable of elaborating an action plan and implementing it over the long-term in the unusual context of a developing city. Managers need training, to be put in a network and shown that any situation, even those that seem most desperate, can be improved. And they need to be given the tools to complete the task – that's the key."*

1_ AgroParisTech, Director of the Chair ParisTech "SUEZ ENVIRONNEMENT WATER FOR ALL"

Initial results of the Executive Masters program

The program is currently administered on the basis of four alternating 3-month training periods. Two 3-month periods are conducted in a classroom setting, while two 3-month periods take place in a company setting. This fosters constructive hindsight between observations and analyses, as well as providing experience in implementing actions and plans. The program's trainers are professionals from the sector, many of whom are experienced executives from *SUEZ ENVIRONNEMENT* and its subsidiaries. Each trainee, having elaborated a strategy and action plan in cooperation with his or her own company, returns and implements the changes that were devised over the training course. The program's curriculum is designed to cover all the practical aspects that make a good manager (customer management, social, political, and financial behavior), rather than teaching *ex cathedra*. Consequently, many of the strategic action plans elaborated in 2010 by our first class have already been implemented. And, as the implemented action plans cover a wide range of service activities to improve the performance of the infrastructures, water distribution, and customer management in the trainees' cities (i.e. Bamako, Ouagadougou, Kinshasa, and cities in Haiti), the entire company and its personnel are often involved in implementing new organizational procedures that are more efficient, and, most significantly, they are introduced to a culture of change. Such was the case for the Romanian city of Piatra Neamt (130,000 inhabitants), where in 2011, the general director (2nd OpT class) drew up the broad guidelines for progress and change for the next 10 years, department by department.

Initial observed results have been compelling – even though it is still too early to fully gage the benefits of the training, as the trainees just barely reintegrated their positions in 2010 and 2011. Service improvements can only be measured over the long term, or about 10 to 15 years, stressed some successful leaders, like William Muhairwe, general director of the National Water Sewerage Corporation (NWSC) in Uganda, and a training contributor in the training program. Despite this, the new production director (1st OpT class) of the new *Société Malienne de Gestion de l'Eau Potable* (SOMAGEP) has already raised output over the first half-year of 2010, and another graduate (also 1st OpT class), who was named operational director of the *Office National de l'Eau et de l'Assainissement* in Burkin Faso (ONEA), has ensured the company's strategic commitments for the period 2011 and 2015 are in line with his projections. But it is also in areas of consensus building, mediation, and more refined field organization that much progress has been made. This involves improvements in the coherence of projects and partnerships, better understanding of public needs through social engineering and community involvement, and the promotion of user ownership of services which facilitates better relations with the operator and improves revenue collection. In a bid to find means of improving water distribution, one trainee organized an awareness campaign among public fountain operators in poor districts to ensure the maintenance of the fountains and an appropriate monitoring of revenues from the water sales; a second trainee initiated regular periodic meetings with meter readers to recommend collaborative solutions to the problem of bonuses.

Over and above their efforts to communicate and share common goals with other stakeholders in a city's water sector, including local politicians, businesses, and industries, the trainees also brought a new spirit of cooperation and internal organization by establishing new channels of communication that were both bottom-up and top-down. The department head of periurban communities of ONEP in the Cote d'Ivoire, a public entity in charge of investments, described it this way: *"We have been able to make changes to our method of planning work, reception, and internal communications. Each Tuesday, a meeting is held between the director and department heads and between the department heads and the supervisors; the relations*

Graduation of the International Executive Master OpT 2010/2011

between middle management and the field operatives have been enhanced through the deployment of more professional practices. The progress is a significant development; it wasn't that way before."

New managers who are versatile and exemplary in performing their duties

From a career development standpoint, some graduates have already obtained promotions as soon as they returned to their jobs. Two were appointed operational directors in charge of service continuity and drinking water quality, heading up a support team of over 120 technicians. All trainees agree that the training prepared them to better deal with their teams, and it boosted their confidence and powers of persuasion. By abandoning an individual concept of success for that of a collective dynamic, the trainees are committed to promoting a professional ethic of responsibility, exemplarity, and respect for both users and personnel. The wish voiced by the president of the Strategic Orientation Committee of the Chair ParisTech "SUEZ ENVIRONNEMENT WATER FOR ALL" calling on trainees "to not return the way they were" appears to have been fulfilled.

www.agroparistech.fr/International-Executive-Master-OpT,2132.html

TOWARD MORE EFFICIENT ASSET MANAGEMENT: THE EXAMPLE OF THE CAEN-LA-MER URBAN COMMUNITY

Kevin Nirsimloo[1]
Frédéric Cherqui[2,3]
Max Lample[4]
Géraldine Rouland[4]
Pauline Debères[1]
Cathy Werey[5]
Mehdi Ahmadi[1,6]
Pascal Le Gauffre[2,6]
& Jean-Christophe de Massiac[1]

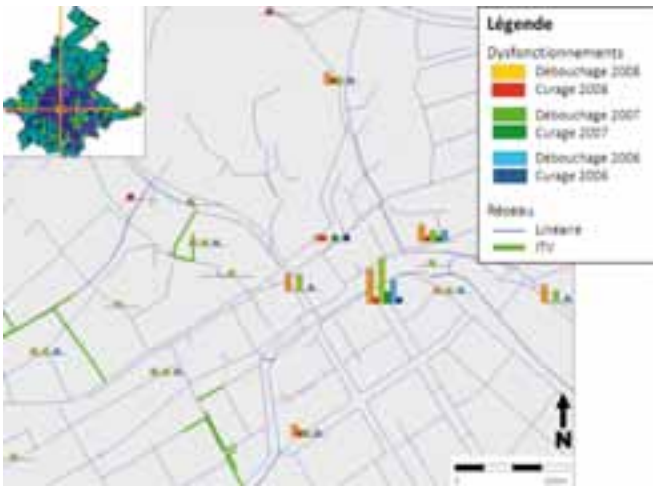
KEY WORDS: sewer asset management, CCTV inspection, multicriteria analysis, INDIGAU, RERAU, rehabilitation, planning

The context

The stewardship of an existing sanitation network implies maintaining the infrastructure in a satisfactory state with respect to all sanitation, environmental, and economic requirements. This includes data acquisition, infrastructure performance assessments, and the rehabilitation of elements or sub-systems that are either malfunctioning or at risk of malfunction. Visual inspections, and particularly video inspections (CCTV), are commonly used to assess the status of sanitation networks (Ana et al., 2007; Knolmar & Szabo, 2003; Rahman & Vanier, 2004). The recent implementation of the European standard NF EN 13508-2 (AFNOR, 2003) has led to significant changes in the identification of defects observed during inspections and to a standardized coding system, thus ensuring the comparability of results and facilitating the pooling of data (Dorchies, 2005; Werey et al., 2006; Werey et al., 2009).

The evolution in practices over the last few decades, notably with the widespread introduction of geographic information systems (GIS), now makes it possible to boost the knowledge and understand the status and operation of these existing asset system. As such, the assessment of sanitation systems must be structured by the definition of criteria or performance indicators such as those defined in the French national urban wastewater network rehabilitation project (RERAU-*REhabilitation des Resaux d'Assainissment Urbains*). These performance indicators are used to better exploit data obtained through complementary means: visual inspection of collectors, network measurements, operational data, and exposed environment vulnerability data (see figure 1), etc. The RERAU method led to the elaboration of several categories of indicators that produce a prioritized view of network segments in terms of inspections and rehabilitation need.

Figure 1: example of a mapped representation of data derived from wastewater network interventions and maintenance



The tool and the method

The RERAU project was further developed during the project INDIGAU (INDIcateurs de performance pour la Gestion patrimoniale des réseaux d'Assaisissement Urbains), which was

1_ G2C environnement, 2 av Madeleine Bonnaud, 13770, Venelles, France
2_ Université de Lyon
3_ LGCIE — Université Lyon 1, F-69622, Villeurbanne, France
4_ Communauté d'Agglomération Caen la Mer, 21 place de la République, 14050 Caen Cedex 4
5_ Cemagref UMR GESTE, 1 quai Koch, BP 61039, 67070 Strasbourg Cedex, FR
6_ INSA-Lyon, LGCIE, F-69621, Villeurbanne, France

created to render the RERAU methodology operational. This was accomplished primarily by:

- Automating the reading of video inspections according to specific local features of the network as defined by the utility manager,
- Defining and prioritizing rehabilitation needs by assigning three levels of priority to the various network segments,
- Allocating hydraulic dysfunctions to sectors and integrating weather considerations into the assessment of hydraulic dysfunction indicators,
- Defining recommendations for the economical assessment of vulnerabilities and impacts.

In general, the INDIGAU project helped produce several computer-generated prototypes, methods, and recommendations for assessing dysfunction indicators as well as vulnerability and impact indicators. The engineering and software company G2C Environnement then further developed these tools and the results from subsequent experimentation laid the groundwork for the rapid development of programs for network managers.

The program

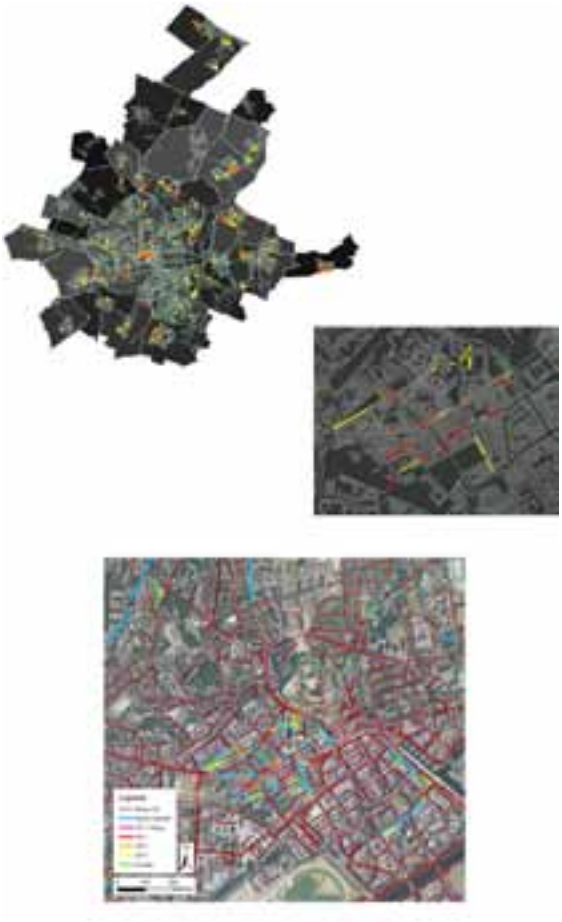
The Urban Community of Caen la Mer is one of the first communities to use the tools developed by the INDIGAU project. This Urban Community, created in 2002, manages a wastewater system (900 km of network) serves 29 different municipalities. In an effort to better manage the sanitation system and appraise its status, a comprehensive study of the system was undertaken in 2008. This study, in addition to conventional hydraulic modeling and diagnostic phases, included an in-depth look at the management of the infrastructure and a forecast of investment needs for the rehabilitation and renewal of the networks. In conjunction with the comprehensive study of the wastewater and storm water system of the Caen la Mer Urban Community conducted by a G2C-COMA joint venture, a network rehabilitation program was developed using the INDIGAU decision-support tools. This program involves six major steps:

- Defining which data was available and applicable to Caen la Mer from the complete list of exploitable data in the RERAU methodology,
- Selecting the rehabilitation criteria to be taken into account based on these availabilities and stakes,
- Formatting the video inspection data and environmental description of the network,
- Calculating the ten dysfunction indicators that would permit an assessment of the infrastructure in which the rules and grades provide a classification into four levels of severity ranging from G1 to G4,
- Calculating the rehabilitation criteria and conducting multi-criteria analyses in order prioritize rehabilitations,
- Identifying the constraints and making recommendations to ensure continuity in the management of Caen's infrastructure.

Initial evaluation

The method revealed the network segments most needing rehabilitation by the community, which were made apparent by using the predetermined criteria (see figures 2, 3, and 4). The approach involved grouping the criteria categories into three distinct groups: environmental, social and economic. This classification facilitated the use of the method by giving the operator the option to intuitively select the aspect or section it deemed to be most important. The results provided the basis for a 30 linear kilometer network rehabilitation program.

Figures 2, 3 and 4: mapped representations of pipes most in need of rehabilitation
This community-wide, large-scale implementation enabled an initial evaluation of the method and the tools that were employed.



Local issues

The methodology developed by the RERAU project was designed to exploit all the data available in an urban community. However, not every urban community has such a wide range of available data. It is thus important to first analyze the distinctive issues facing each urban community in order to target the criteria that will provide the most information, notably those which will guide the operator in deciding where to begin rehabilitation efforts.

This preliminary study may rely on diagnostic studies conducted in the community (regional development efforts, sanitation network diagnostics, etc.) that are either based on historical information acquired by managers of wastewater networks or on priorities set by the managers. This will help avoid the collection of data that would not prove useful or exploitable.

Video inspections and the sanitation network

The simultaneous exploitation of a large quantity of video reports is a real innovation compared to what is commonly done today. The automated interpretation provided by INDIGAU is the result of the RERAU and INDIGAU research programs and is based on the expertise of a number of French operators. It gives the operator the option to devote more time to studying sections considered to be in poor condition (G3 or G4).

The text files produced by the coding system recommended by the European standard EN 13508-2 are usually not used by managers that tend to prefer reports and/or video inspections, which are more legible and explicit. For this reason, the description of the section visited is often very succinct (the community, town, street, name of section are rarely provided). The operator often only refers to the visible elements on the inspection sheet that is attached to the report. Yet section identifiers are essential for automated data processing. Without a map reference or distinct nomenclature, it is impossible to relocate the section, particularly from a database in which all the video inspections are stored. This is particularly true when the name of the town and/or the name of the street are not provided.

The correction of text files can be very laborious. In addition to updating identifiers, it is often necessary to make deep structural changes to the file. This is mostly due to the differences between the network recorded in the GIS and the division of the pipe network into sections during the inspection.

So, if a community opts for an automated exploitation of video inspections by cross referencing other data, it is essential that it specify the video output formats (standard EN13508-2, electronic exchange file and use of GIS compliance codes for manholes and sections) in its calls for tenders.

The "INDIGAU club"

The triangular relationship involving G2C Environnement, researchers, and users within a users' club will help foster continual improvements to the INDIGAU systems. This relationship will benefit from semi-annual meetings during which developers will introduce the latest methodological advances, and communities will express their needs in terms of software ergonomics, functionality, and even methodology.

Within these users' clubs, each community may designate an expert (if it chooses) who would be able to participate in regular advisory campaigns on selected sections, with a view to constantly improving the relevance and accuracy of the expert system. Indeed, INDIGAU contains an algorithm that allows for the use of expert advice in steering the rating system toward objective consensus while taking into account local peculiarities. The database already contains several thousand expert opinions.

Figure 3: Interface of the INDIGAU program showing "infiltration" dysfunction levels of severity from G1 to G4.

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PERFORMANCE IMPROVEMENTS FOR A DRINKING WATER DISTRIBUTION SYSTEM IN A RAPIDLY GROWING METROPOLIS - THE CHALLENGE POSED BY SHANGHAI

{ Laurent Pelletier[1]

KEY WORDS: dynamic mapping, hydrolic model, sectorisation, traceability leak, detection, China

In September 2002, the city of Shanghai entrusted Veolia Water with the management of water services in the Pudong district. With a population of 3 million people, the average volume of water treated and distributed in the district is 1 million m3 per day. The contract, which is a joint venture with a Chinese partner, covers water treatment and water distribution facilities.

The challenge involved improving the performance of public water services while meeting the needs related to very rapid population growth, which required the installation of new supply networks and the construction of new water treatment plants. Water demand grew by 7 to 8% per year during the first few years of the contract due to the rapid development of new residential districts and the construction of new factories and industrial parks.

In this context, it was vital to both:

- Supply new consumers, by maximizing existing supplies and by building extensions designed for the long-term
- Maintain and improve the performance of existing structures.

The importance of the second point is not to be neglected. New urban zones have been built very quickly, within a just a few years, like elsewhere in China. The deterioration of water networks and the need for their replacement posed a dilemma. The impacts and the investment burden would be considerable in the short term.

Veolia Water implemented a global approach to meet this challenge. One aspect involved the improvement of the existing network, with a long-range view taking into account anticipated needs in order to invest at the right time and in the right place.

What are or will be the demands of current and future consumers? The solution: dynamic mapping

The mapping of the entire infrastructure was a critical step in meeting the growing demand for water. This required the analysis and plotting of all underground networks and all related information (pipes, valves, etc.), as well as the location of consumers and their network connection means to better assess the points of usage, the water volumes involved, as well as the potential impacts to users caused by failures or network extensions.

In practice, one of the key steps in a growing metropolis threatened by a potential water shortage involves the adoption of a **dynamic** method. The development, data collection for and use of a Geographic Information System (GIS) contribute greatly to **decision-making and daily operations**, including:

- At-a-glance local status visualization that also provides information concerning changes in demographics and relevant activities
- The identification of water gates in order to isolate a conduit in case of breakage or leakage
- Consumers affected by disconnected water supply, identification of sensitive consumers
- Identification of deficient zones, etc.

1_ Veolia Eau

1_ Supervisory Control and Data Aquisition

The GIS is now the architectural core of the water supply network tools. It enables the visualization of data collected out in the field as well as real-time data provided by the SCADA1 system, or other data calculated through the use of simulation tools that program administrators can use to optimize supply network performance.

The aggregate length of the network doubled in 10 years: meeting the challenge through a practical hydraulic model

In Shanghai, **the hydraulic model** developed by Veolia, combined with mapping, has made it possible to both optimize the existing network and simulate future demand. For example, this was done through the simulation of different pressure levels in the network according to a demand scenario, and by comparing the pressures calculated by the model with those observed in the field.

A variety of professional skills (including those of urban planners, demographers and economists) was necessary in Shanghai to provide key information concerning locations, water usage and consumption modes to better anticipate evolutions of the network.

In this rapidly growing city, new zones are constantly being integrated into the existing network. The aggregate length of the supply network has increased from 1,800 km to 3,800 km in less than ten years. Ensuring that the right dimensions are integrated into the network is essential, as is the anticipation of quality issues affected by increases in flow rates and changes in direction. In certain zones, a well calibrated model would make it possible to compare theoretical data with data gathered in situ to better identify problem areas: detect gates that fail to reopen after closure, the occurrence of major leaks, etc. The tool is used on a daily basis to reduce wastage and prevent dysfunctions.

How to respond quickly to leaks and choose appropriate action plans: detailed breakdown of network grid

To better assess network performance, 400 electromagnetic flowmeters were installed to divide the Pudong territory into 34 sectors and to provide very fine performance monitoring.

Installation of electromagnetic flowmeters

Example of sector (inputs-outputs accurately measured)

This analysis allowed the evaluation of output by sub-sector, and subsequently the targeting of priorities. The ability to monitor nighttime flows was also very valuable as it enabled a more rapid response as soon as a large leak occurred.

How to reconcile water quantity with water quality

CONTINUOUS MONITORING OF NETWORK WATER QUALITY

In addition to the monitoring of volumes of water distributed and water lost, a means of analyzing water quality was implemented. Maintenance crews have vehicles equipped to collect samples throughout the network, which are taken to a laboratory for analysis.

Furthermore, sensors developed and installed by Veolia measure water quality on a continuous basis. The main characteristics of these probes are their modest cost, ease of installation and maintenance, and ability to transmit data through the GIS via central servers.

Kapta probes allow for continuous quality parameter measurements

Also, certain points have been equipped with coupons to monitor biofilms. Biofilm forms on the coupons and is later removed for analysis.

LISTENING FOR LEAKS

To reduce physical loss (leaks), acoustic leak detectors have been installed to identify zones prone to leakage before sending out crews with conventional equipment.

Daily monitoring of data returned by the acoustic leak detectors

These sensors "listen" to the network at night and the operator is provided with locations that indicate a high probability of leaks.

TRACEABILITY

The integration of all of our tools (GIS, SCADA, etc.) now allows real traceability. Any network malfunction (quality complaint, etc.) can be localized, associated and explained by relying on the models that can retrace the path of the water and by deducing what must have occurred upstream from the location of the complaint.

THE CONTROL CENTER, OPERATIONAL HEART OF THE NETWORKS.

All of the tools are interconnected. The results can be visualized in the control center, which has been transformed into the operational hub of the network.

Operators in front of their control screens (3D view of the city)

Keeping pace with urbanization: optimization of rehabilitation and sustainable management plans

Short- and medium-term rehabilitation plans are based on data returned from the field and statistical and multi-criteria failure analyses, taking into account the probability and the consequences of breakage over the coming years, as well as quantity and quality objectives.

Conclusion

The different practical solutions introduced for managing the Pudong water distribution network will ensure the maintenance and improvement of performance levels over the next fifty years, with a view toward technical, financial, social and environmental stability.

Within just a few years, the efficiency of the Pudong distribution network increased by 10%, on a like-for-like basis. Though the network doubled in size, quality complaints were reduced. Investments in maintenance and modernization are programmed proactively.

All the initiatives launched in Shanghai have now been integrated into the other contracts Veolia has in China.

IMPROVING THE "NETWORK PERFORMANCE" IN BORDEAUX

Christophe Anselme[1]
& François Figueres[2]

KEY WORDS: yield, losses, modulation, pressure, non-revenue water

Introduction

Public service delegation contracts include an increasing number of specific targets that are essentially contractual performance indicators that delegatees are expected to comply with, as is the case with the Urban Community of Bordeaux's drinking water concession contract.

The efficient management of drinking water systems, measured by the reduction of unaccounted volumes and the improved efficiency of the network, is a very important issue (which is in line with a broad policy objective of curbing excessive reliance on the shrinking groundwater supplies in the Gironde) that has prompted the Entreprise Régionale Bordeaux Guyenne of Lyonnaise des Eaux to formulate a very proactive action plan. To this end, it is employing stewardship management tools it developed to assess the impact of renewal policies on non-revenue water (NRW). Moreover, it implemented an innovative technology called pressure modulation, while vigorously pursuing and focusing on leak detection activities.

Simulations of aging infrastructure and the impact on non-revenue water

Every year, the delegatee must define and implement plans for the rehabilitation of the water distribution network (pipes, connections and meters) that are intended to help optimize service performance and comply with contractual and regulatory objectives. In this context, Lyonnaise des Eaux has been developing a tool for network infrastructure management called PREVOIR.

PIPES

PREVOIR Canalisations (pipes and conduits) provides a model of the aging of the pipe network, taking into account the factors contributing to failure that are intrinsic to pipes and to their environment (installation date, composition, diameter, nature of ground, water pressure, etc.) as well as variable factors contributing to failure over time (temperature, leak detection activity level).

It enables:

- A forecast of the number of pipe breakages per year depending on the rehabilitation policy
- The identification of leaking pipes
- The development of an optimized pipe rehabilitation plan that takes into account contractual targets and operational constraints (tramway related works, road works, red-tide related rehabilitation works)

CONNECTIONS

Breakage and leaks that occur to drinking water network connections are responsible for the largest share of physical water loss observed throughout the supply network.
Furthermore, the accelerated aging of black polyethylene connectors has already been demonstrated in the past, and recent studies show that the service life of blue band polyethylene connectors may vary depending on environmental and operating conditions.

Given this context, the Technical and Scientific Department of the Entreprise Regionale Bordeaux Guyenne of Lyonnaise des Eaux undertook the development of a decision-support tool, PREVOIR Branchement (connections), that enables:

- An estimation of shifts in physical losses related to broken connections
- An estimation of changes in the number of water connection breaks depending on the rehabilitation policy, and an assessment of subsequent investment costs
- An estimation of the service life until the first, second, or third breakage of black polyethylene and blue band polyethylene

1_ Technical and Scientific Director at Lyonnaise des Eaux Bordeaux
2_Deputy Director of Research and AMO at Lyonnaise des Eaux Bordeaux

connections based on a cohort model projection.

WATER METERS

The under-counting of client meters is responsible for a significant share of the unaccounted water volumes distributed through the network. The ability to accurately and reliably estimate volumes unaccounted for based on a multi-year meter replacement plan is thus very attractive, most notably in conducting an analysis of water losses in the network.

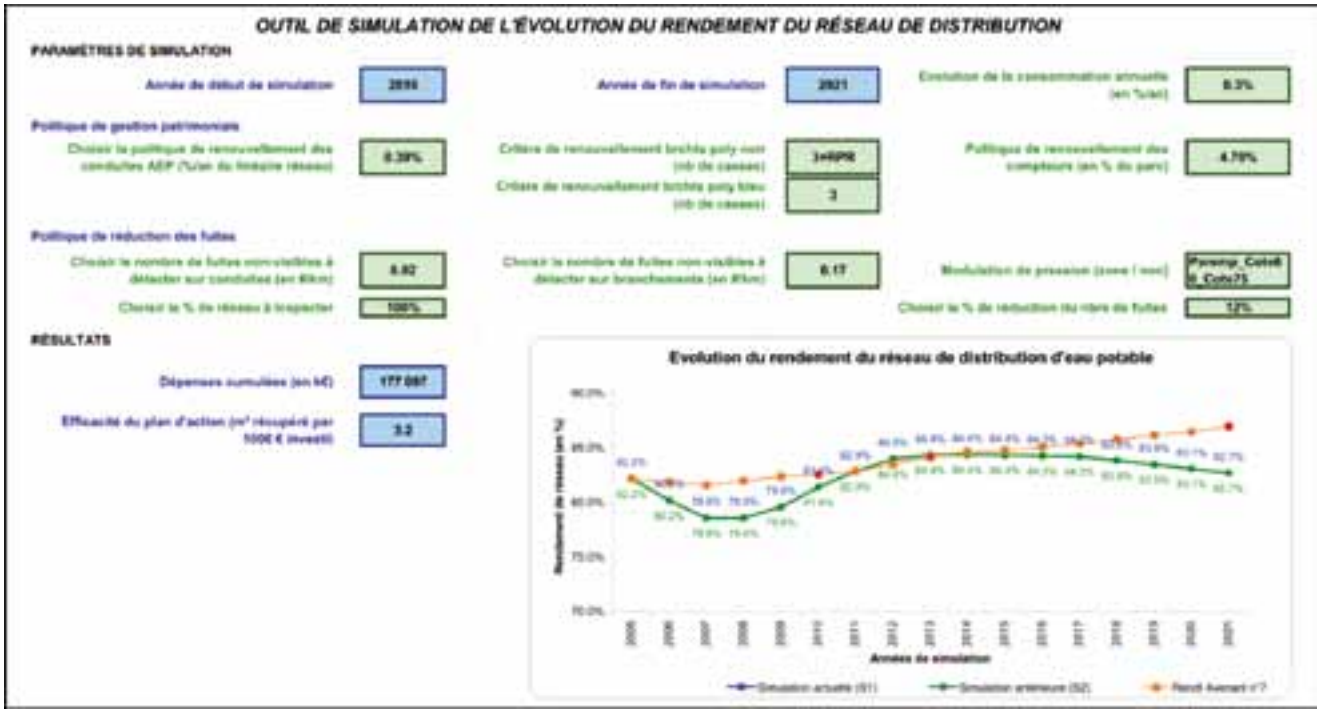
PREVOIR Compteur (water meter) enables:

- An accurate estimate, depending on the investment strategy, of the evolution of unaccounted water volumes related to meter counting errors, and to deduce the volumes gained for invoicing upon meter replacement
- An assessment of the investment required to replace meters in compliance with contractual and regulatory commitments with respect to the age of the meters
- A measurement of the impact of work plans on investments (meters replaced during programs to remove lead connections or the impact of remote meter reading)

EFFICIENCY

The real issue raised by Non-Revenue Water is the capacity to assess the impact of actions defined in the initial Non-Revenue Water action plan, thanks to these tools. With this in mind, PREVOIR Rendement (efficiency) (Fig.1) provides a simulation of the impact of defined stewardship policies on changes in efficiency, based on results taken from stewardship management tools described earlier.

Figure 1: Aperçu du tableau de bord de PREVOIR Rendement



Operations

PRESSURE MODULATION

Following a feasibility study, Lyonnaise des Eaux proposed the installation of a large-scale pressure modulation system to the Urban Community of Bordeaux (Figures 2 and 3). This innovative technology involves modulating the water supply pressure of a sector in such a way as to stay as close to the minimum required pressure as possible, which allows for operational optimization without affecting the quality of the service to users. The effect of pressure modulation on curbing water loss is two-fold: it lowers the leakage flow rate and reduces breakage.

The project involved two phases corresponding to two sectors identified for pressure modulation:

- 75M, with an aggregate linear total of 660 km (20% of Urban Community of Bordeaux network)
- 60M, with an aggregate linear total of 200 km (6% of Urban Community of Bordeaux network)

Seven modulation valve chambers were added to DN200 to DN600 conduits.

Modulation of the 75M network began in June 2010, and the 60M in March 2011.

The population in the area affected is 175,000 inhabitants.

Modulation has an impact on reducing leak flow rates, which is most noticeable by the drop in water loss volumes (see paragraph 3: results). Furthermore, initial results show that the breakage rate of pipes and connections has been halved when compared to the unmodulated zone. (This estimate requires confirmation by monitoring the breakage rate over a period of several years.)

Figure 2: Maximum pressures before and after modulation

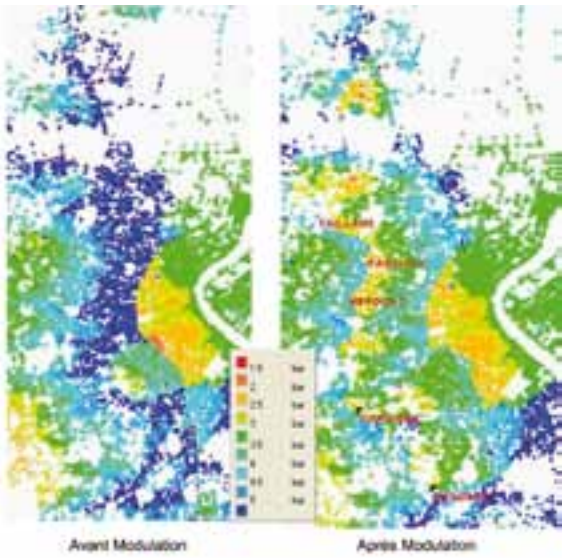


Figure 3: Modulated zones

ACTIVE LEAK DETECTION

Active leak detection efforts were intensified at the same time as pressure modulation became operational. Today these efforts span 3800 km per year, or a linear total of 3200 km.

Also, both network segmentation and a pre-localization system have helped target sectors requiring detection efforts and increased efficiency. Consequently, the linear leak diagnosis rate dropped from 7km per leak to 3.5 km per leak in just a few years.

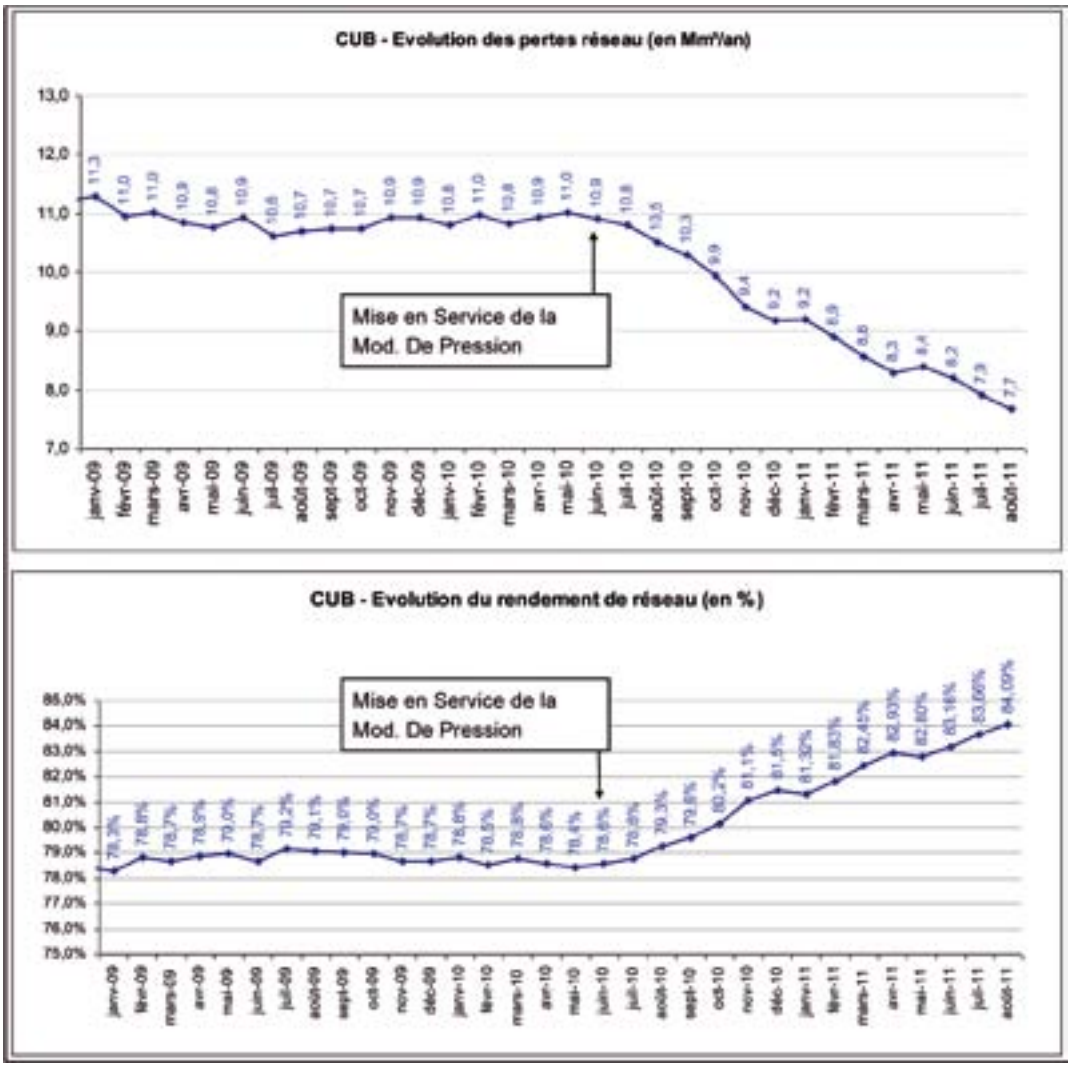
The segmentation divided the 3,200 km of the Urban Community of Bordeaux's water supply network into 34 sectors. All measurements (flow rates, pressures) from these sectors were remotely uploaded and stored (in long-term databases) and are used to provide sector-specific results.

Leak detection is performed throughout the water supply network of the Urban Community of Bordeaux and adapted to the leak propensity of each sector. For example, the Paulin-Béquet neighborhood of Bordeaux has been the object of four systematic leak detection campaigns.

RESULTS

This ambitious action plan has resulted in a steady improvement in performance indicators, as illustrated by the graph below (Figure 4), which represents the monthly assessment of both network losses and efficiency.

Figure 4: Evolution of network losses and efficiency



3

Performance of services, sustainable development and urban integration

DEVELOPING ACCESS TO WATER SERVICES IN AN URBAN ENVIRONMENT: **GOOD PERFORMANCE REQUIRES INNOVATION, EXPERTISE AND PARTNERSHIP**

Olivier Gilbert[1]
Judith Buelvas Pérez[2]
Patrick Rousseau[3]
François De Rochambeau[4]
& Oscar Garcia[1]

Experience gained from Morocco, Ecuador, Colombia, Niger and India

KEY WORDS: optimization, pricing policy, connection, collective access, assessment

In emerging countries, thanks to the public service concession contracts signed by Veolia Eau and Proactiva for water and sanitation services, Veolia Envrionnement oversees programs to expand access to basic water services to poor and low-income households. This issue prompted Veolia to develop a new social engineering approach integrating technical, financial, marketing, communication, and legal expertise, and to work with a number of specialists with expertise that complements Veolia's own. Indeed, the effort to boost access to basic essential services requires both innovation and partnership.

By the end of 2010, through its contracts in Africa, South America, and India, Veolia Eau had brought water to more than 3 million people living in cities and suburbs, of which almost half benefited from social programs to expand access to water.

The expertise that has gradually been acquired by the Group over the last 15 years is largely based on its efforts in both methodology and innovation, as outlined in the following points:

Optimizing the operation makes it possible to serve more people with the same installations and the same resources

When a public authority entrusts us with the management of its water services for several years, our first mission is to restore, even rehabilitate, then improve the status and operation of existing structures, treatment plants, and networks through diagnostic studies, segmentation of the network, increased efficiency, and the installation of flow meters (of both water produced and distributed) where needed, etc. This is the core business of an operator. These actions, undertaken at the very beginning of our contracts, are intended to improve the quality of the service for users over time. What is less obvious is that they also contribute to providing service to more people with the same water resources and without the construction of new structures or the expansion of existing structures.

In Niger, operational adjustments to the networks and installations by the utility SEEN (*Société d'Exploitation des Eaux du Niger*) that began in 2001, brought water back to streets where it had ceased to flow due to a lack of pressure. In India, on the heels of a performance contract signed with the city of Nagpur (Maharashtra), Veolia optimized water services by lowering network leakage from 52% to 31%, which boosted continuous

1_ Social Innovations Officer – Veolia Environnement – Director of Sustainable Development
2_ Executive Director of Monteria Contract – Proactiva Aguas de Monteria
3_ President and Executive Director of Veolia Water India
4_ Director of Operations and Resources / Middle East and Northern Africa / VEOLIA Eau
5_ Executive Director of Guayaquil Contract – Interagua

water services to an additional 200,000 people. Most of these people live in slums and had been lucky to get between two and six hours of water service a day, at best.

Implementing water rates imposed by public officials while ensuring social compatibility

It is in everyone's interest, residents, water users, public officials, and operators, that the cost of water be socially acceptable. In developing countries, the financial burden of essential investments is far too great to be carried by the customers alone. In such cases, the notion of *"acceptable cost recovery"* from water users is replaced by *"full cost recovery"*. With this in mind, public officials in charge of setting rates and water rate policies must determine what the public can afford to pay, including the most indigent. Furthermore, they must decide what financial mechanisms will be used to compensate for users who cannot afford to pay the actual cost of water services.
The operator is responsible for implementing these policies while seeking a socio-economic optimum. It must organize its services to ensure that each customer segment, existing or future, has access to water at the most suitable rate and provide information relative to the service provided at that rate.

In Colombia and in Ecuador, the basic rate is set according to the amount of drinking water consumed by the customer per month. Those who consume more pay a higher price than those who consume less. However, in new suburban neighborhoods located on underdeveloped land, a minimum level of service is provided at special rates that are set according to the legal status of the neighborhood and the nature of their installations. Hence, in neighborhoods that only possess the most basic level of service (tank and standpipe) a special rate is applied that is different from the social rates applied in neighborhoods where basic services are being installed (water, wastewater, and public roads under construction). The method of setting rates neighborhood by neighborhood is just one option among many, but it is an attractive option as it enables modular services when cities and the configuration of its neighborhoods evolve rapidly, and it is relatively simple to implement.

The operator must come up with proposals to change rate systems or adapt them, depending on the situation it finds in the field from day to day. For example, in Tetouan (Morocco), while the rates decided on by officials provided for several levels, including a social rate (water is billed at a rate lower than the operator's production cost), Amendis offered to charge rates applicable to communal housing, where sub-metering (by apartment) makes it possible to apply the lowest social rate by apartment and not by building. This meant every low-income family had access to the social rate.

Expanding individual connections in conjunction with social programs

It is not enough to reduce the price of water for users if most households don't have access to water networks. The cost to be connected to the public service is often prohibitive for many households. It is for this reason that since the 1980s, social connection programs have been developed in many countries.

The programs required innovative approaches in all areas to ensure:

- The project is embraced by those it aims to assist, which implies opening a dialogue with those concerned, coupled by the occasional intervention of sociologists or anthropologists.
- The mobilization of adapted financing, which, if the context permits, would require cross-subsidies and a call for complementary resources in the form of a local, national, or international partnership, as was done in Tangiers (Morocco) with OBA (output based aid) that Amendis undertook for the World Bank and the GPOBA (Global Partnership for output based aid)
- Overcoming administrative barriers that prevent access to the funding required for water service connection programs[6] or to the provision of service to people who have no property title or housing authorization in neighborhoods built on land with no cadastral registry, without necessarily challenging pre-existing legislation. These important issues cannot be settled without a strong political will, and without administrative innovations and the cooperation of local officials in charge of housing and subdivision management
  In Tangiers, in 2006, within the framework of the INDH (*National Human Development Initiative*) such cooperation culminated in the creation of the Social Connection Committee, dedicated to monitoring the installation of basic services in informal housing districts. Meetings were held every other week for this purpose and attended by the Willaya (the prefecture), the communities, the services of the delegating authority, the urban agency, and Amendis, etc. The Committee's objective was to examine and resolve all the legal and practical problems that stand in the way of connecting districts and neighborhoods designated to receive basic services.
- The transition of the networks in sectors whose geographic, urban, financial and human characteristics transform each construction site into a challenge requiring technical feats of adaptation

The success of these programs also requires a good dose of humility when taking into consideration the human implications, the number of stakeholders involved, the size of the task and the many pitfalls that loom large, which those who have already

6_ The work of Hernando de Soto has shown that the lack of a property title system has impeded the economic development of poor nations.

wrestled this beast know all too well. Success implies working in partnership, first and foremost, with those most concerned by the project (the beneficiaries and the public authorities) as well as other stakeholders (associations, cooperation agents, neighborhood elected officials, community representatives, and other parties) whose expertise is critical for the successful completion of the projects.

In Morocco, to facilitate access to individual connections, *Veolia Environnement Maroc* developed, at the request of Moroccan authorities, low-cost connection operations for more than 100,000 households, for over 200 million euros in construction costs. Between 2003 and 2010, almost 350,000 people benefitted from an access to drinking water in their home thanks to the system, and almost 150,000 were connected to sanitation networks.

Ensuring the reliability of a collective access mode for those without individual connections

While individual access is certainly the best solution for improving the living conditions of inhabitants from a standpoint of hygiene and freed time, not to mention economic independence (with respect to water resellers, for example), it must be acknowledged that it cannot be applied everywhere right away. It is thus advisable to organize collective access systems that ensure the quality, accessibility, and availability of water.

With this in mind, Veolia developed a system called Sagayti that enables low-income households, those who cannot benefit from individual low-cost connections, to obtain several m^3 of prepaid water per month. In this case, it is an individual- and secured-access standpipe. So, in Morocco where this system was developed, the communities who accepted to try it (Temara and Salé) offer the first four or six m^3 per month to all eligible households. This system completes the subsidized connection offer by providing service to the poorest, while reducing water wastage often associated with free access standpipes or by preventing the abusive appropriation of the standpipes by individuals or companies outside the neighborhood.

This innovation provides for free access to water that meets the basic needs of the most indigent populations and limits constraints on water resources. In doing so, it contributes to rational and sustainable management, and an equitable division of water access[8]. This solution has also attracted growing interest among authorities and operators in a number of countries.

Similarly, a program of "public standpipes" was created in Montiera (Columbia) to make water available to those living in slums that proliferated primarily from the influx of people fleeing the armed conflict that has blighted the region. In 2010, with 16 different standpipes installed, 11,500 people benefitted from the program (almost 3% of the city's population). A subsidized rate of 0.21 euros per m^3 is included in the program, while the normal rate is set at 0.48 euros per m^3.

Developing localized customer services, adapted to the populations

Regardless of the standard of living of its users, operators must provide tailored "client and commercial" services that ensure local clients a high level of accessibility and provide explanations and solutions that reflect the client's situation. Such an approach requires flexibility and innovation to best adapt client services to not only meet the needs of those residing in the center of the city, but also to those in the suburbs (or even semi-rural settings), and to those living in highly dense urban environments as well as those living in remote isolated zones. For operators, a localized customer approach should be considered an asset that is planned and developed.

In Guayaquil Ecuador, Interagua created a service that caters to all local inhabitants (about 2.6 million), many of whom live in slums and informal settlements. The service, called "Community Management", which works in tandem with their counterparts in other delegated companies and communities, organizes public briefings with those concerned before each project launch. In Monteria, Colombia, a similar service called "Social Management" was created by Proactiva for low-income and working class neighborhoods, most notably those who fled rural violence. In both cases, local inhabitants' opinions are heard and taken into account during the meetings that are held in their own neighborhoods. The feedback from the locals has an impact on the practical organization of the projects. While this preparatory work necessitates extra resources on the part of the company (training, management tools, indicators, etc.) and extra time to forge social ties, these investments pay off in the end as the projects are better designed, and many problems and misunderstandings are avoided early, before it is too late. In Nagpur, India, Veolia Water India has an on-going daily relationship with neighborhood representatives called Water Friends, who are organized in a network. They are locals who volunteered to serve as intermediaries between the operator and the residents.

In another example, the creation of "Mobile Agencies" (buses transformed into customer service offices by Veolia and Proactive) puts specially trained personnel out in the field where they can assist with administrative tasks, like requesting a subsidized connection, signing up for service, or paying invoices.

7_ Cf. « Saqayti, pour une meilleure rationalisation de l'utilisation de l'eau en libre service » d'Olivier Gilbert et Thomas Hascoet, in « L'état des ressources en eau au Maghreb en 2009 » de l'UNESCO.

These mobile agents can travel into remote neighborhoods and villages far from city centers, on dates fixed in advance with the representatives of local residents. This enables all clients, even the most remote and those without means of transportation, to have access to customer services every month without having to travel. These innovations are particularly appreciated by locals who often don't have bank accounts and pay their bills in cash.

Good local relations with users are also an asset for developing programs for good water and sanitation practices. SEEN, in Niger, launched a program on links between water, hygiene and health that is run in partnership with NGOs, artists, and doctors, as well as the Direction Development Durable and experts of Veolia Environnement's Training and Health Department. Veolia considers that the dissemination of clear messages to local residents is an integral part of the service it owes its customers in order to maximize their benefits from an access to quality water and sanitation services.

Assessing the impact of human development activities

To better measure the impact of efforts and activities to expand the access of water services to the poor, the Veolia Group has initiated several assessment programs with scientific partners.

For example, the impact of subsidized household connections in the center of Tangiers was studied in 2007 by J-PAL (Jameel Poverty Action Lab), of the Massachusetts Institute of Technology (M.I.T.), specialized in randomized evaluations of programs to combat poverty (led by Esther Duflo). The study's results show the importance of individual access to water in cities with respect to most human development indicators, notably those of free time, social integration and well-being[9].

An action-research program was undertaken in 2010 prior to the launching of work to individually connect a million residents of the slums of Nagpur, India, with the IRENE Institute of the ESSEC and the CSH (*Centre des Sciences Humaines*) in Delhi. The objective was to prepare an evaluation of the impact on human development.
Beyond the cities, in rural areas, a similar program was undertaken in Goalmari (Bangladesh) by Grameen Veolia Water Ltd in 2008 following the Social Business model developed by Professor Yunus. The end goal is to make drinking water accessible to 100,000 inhabitants in adapted conditions, given that the only water available to the population is groundwater that is naturally contaminated with arsenic (exposing between 30 and 80 million people to potentially lethal levels of arsenic). The program, also conducted in an action-research mode, is a partnership with the Institute for Innovation and Social Entrepreneurship of the ESSEC. An evaluation method has also been integrated into its implementation. VERI (*Veolia Environnement Research & Innovation*) is in charge of evaluating the sanitation portion of the program.

From experience, we believe that to progress and improve our performance in matters as complex and sensitive as the generalization of basic services, the best way requires the assessment of their actual impact on the lives of the beneficiaries, on human development and on the function of the communities. It behooves us to be fully aware of the results of our activities wherever we intervene, and to share these results in order to rethink and shake up our approach, if necessary. Indeed, the implementation of social indicators geared to measure the effects of an operator's managerial approach on users constitutes a valid area of work when considering public service performance.

Performance: assessment and outlook

In recent years, Veolia Eau and Proactiva have had to respond to a growing demand from public officials to expand access of basic services to low-income households. This has brought about changes in our practices as we sought partners with expertise that complemented our own, notably sociological and socio-cultural, as well as help from lawyers and urban planners. Moreover, daily cooperation with authorities and other local stakeholders became essential as each player had to rely on the other to ensure the success of all. The notion of partnership in this case is very real. And innovation efforts must be pursued as the subjects for study and research are still numerous (land, assessment, etc.), while the needs continue to grow apace with rampant urbanization.

For Veolia Environnement, the various projects undertaken and their feedback have helped develop a level of expertise, initially called ACCES, which has been made available to our institutional clients. In new territories, this expertise has been used to propose solutions adapted to their local context, such as tailored connection solutions or social mediation. Similarly, tools such as the Sagayti standpipes or mobile agents are now being used other countries, even in France. Indeed, problems related to the access of basic services (in developed countries this has actually helped maintain households in a state of social and economic vulnerability) now concern all countries.

This expertise is not immutable. It is constantly being developed in the field by various operational teams of the Group and has given rise to a number of methodological tools as well as specific management and performance measurements for operational

8_ Cf. "Happiness on tap: piped water adoption in urban Morroco" (E. Duflo, F. Devotto, P. Dupas, W. Parienté, V. Pons du J-PAL)

agents. Water professionals who are working to improve service access know very well that this is a separate, specialized business that requires the upmost professional rigor.

In conclusion, it should be stressed that this subject requires a real personal commitment from all staff members. In return, they will have the satisfaction of knowing that, despite the difficulties and modest improvements, they have contributed to the public good, which is central to the essence of our business, that of public service. This naturally has a positive impact on our corporate culture, which is by no means the least significant asset in the overall performance of services.

LONG TERM WATER SERVICES PERFORMANCE: **ENSURING SUSTAINABILITY**

{ Bernard Barraqué[1]

KEY WORDS: drinking water, prospective, multidimensional assessment, changes in demand, asset management, governance, redistributivity

The construction of high performance water services in 20th century Europe.

One might conjecture that, on average, Europe has the best public water and wastewater services: nowhere are connection rates higher, due notably to the high population density and long-standing existence of public utilities. But water consumption remains moderate when compared to consumption rates in the United States. This accomplishment is due in part to local officials in most countries who assumed responsibility to follow the example of Great Britain in its new "comfort" policy. Yet, one cannot discount the implication of higher levels of government, notably nation states, which played an important role in building the infrastructure through subsidies, their support of bond issues, by authorizing savings and loan institutions to participate, and most significantly, by attaching a priority to drinking water over other water usages. But the gradual adoption of volume pricing and the transformation of this basic utility into industrial and commercial operations have contributed to the sustainability of public services by ensuring greater self-financing. Indeed, the sustainability of this system is directly linked to the combination of a technical model and an institutional structure in the local public service network. The gradual increase in the number of both water treatment and wastewater treatment plants has transformed urban water services from a matter of water resources into an economic and legal structure that is distinct from general issues of water rights and conservancy.

A model facing an unprecedented crisis

However, the specter of a crisis is on the horizon and a combination of factors could render the situation untenable: first, we're dealing with a mature industry in which the infrastructures require gradual rehabilitation—but without the initial subsidies. And this comes at a time when European directives require increasingly new investment for environmental reasons. Consider of the cumulative cost of the Urban Wastewater Directive to the 15 member countries: 150 billion Euros! And now that wastewater treatment is included in the water bill, rates are inexorably increasing to "recover the costs". It is not surprising that delays in complying with EU policies are accumulating, along with subsequent disputes brought before the European Court of Justice. The situation is particularly worrisome for Mediterranean countries where the traditional approach involving costly engineering solutions is preferred. But this is not all: new charges have been introduced to encourage users to curb wastage in a bid to reduce the load on the infrastructure. While a drop in water consumption has occurred in many European cities and the obligation to balance expenditures and revenues has forced higher water bills, this trend has hit the poor and disadvantaged hard, as they are less likely to be able to afford cuts in their budget. In short, we are finding that Europe has a problem with "the right to water," which was thought to be an issue only developing countries faced.

Reflection on the performance of water services must be complemented by a long-term approach that conventional tools (standards, performance indicators, benchmarks) have difficulty taking into account. The current situation has highlighted the potential tensions between environmental, economic, and social interests, which are often considered separately. Prospective assessment tools can be useful in identifying desirable scenarios for water services and the ways to realize them.

A forward-looking and multidisciplinary research project: EAU&3E

It was this new potential crisis that prompted France's National Research Agency to issue a call for tender for the Ville Durable project: not only the uncertainty of the future demand looms

1_ AgroParisTech / CIRED

large, but an aging infrastructure and social difficulties must be taken into account, all while the governance of conventional water services, that hinges on deciding between the offer of engineers and the demand of elected officials, must be called into question. The winning project EAU&3E (Water&3E) unites six teams of researchers with a wide range of expertise and skills necessary to deal with all the issues, as well as the Eau de Paris (Paris Water Board). Prior collaborative efforts to help lower water consumption in the French capital (-25% over 15 years of billing), and studies on the redistribution effects of water rate systems, convinced us to choose Paris for the project, despite the peculiarities of the site.

The teams include the CIRED, an environmental strategic management team; the laboratory GESTE, of the Cemagref at the Strasbourg ENGEES (National School of Water and Environmental Engineering), the economic team of the BRGM in Montpellier, and the Cemagref of Montpellier for studying water consumption rates and their evolution; the laboratory GEA of AgroParisTech in Montpellier for the sustainable management of infrastructures, and the ADES team of the University of Bordeaux for a cross-sectional study of sustainability in the city that has already begun in partnership with a joint syndicate, the SMEGREG. The latter unites Communauté Urbaine de Bordeaux and the CG 33 in a study of sustainable management of deep, good quality water resources (risk of over-exploitation and salt water seepage), as well as reflection on sustainability in the management of infrastructures and social pricing. In all, the partnership will provide input on three cities, Paris, Bordeaux, and Perpignan in Langudoc-Roussillon. This will make it possible to cover a variety of situations.

The project began with a year-long investigation of the issues in sustainable management of water and wastewater services in other developed countries, specifically those in Western Europe, the USA, and Australia.

At this time, we are working to improve knowledge in each of the four conventional areas of sustainability, the three E's: environment, economy, and equity. And, like the three Musketeers, we've added a fourth: governance. There are two dimensions to the latter: internal governance has to do with reorganizations to improve the work of public officials, technicians and users; external governance deals with territorial-scale changes in the way certain tasks are performed to ensure more resilient services.

The project tackles four main issues:

- Better model possible shifts in water consumption according to various usage scenarios, including recourse to alternative resources and urban planning; then assess their impact on service budgets;
- Better model infrastructure management over the long term, including through changes that would, through a choice of technical options, restore the quality of the aquatic environments in accordance with the EU Water Framework Directive;
- Develop systematic analyses of the redistributivity of user water rates, and study their effects on the most impoverished;
- Study the implementation of a multi-level governance, both external and internal, to allow for a greater resiliency of services in the light of global changes and the increased involvement of citizen-users.

The partnership is essentially a network that is intended to facilitate the addition of data and experience gleaned from other countries. The information gathered is being made available on the project's blog: **http://eau3e.hypotheses.org**.

The last phase of the program involves the development of future water service plans in cities, while benefiting from gains acquired during previous phases; the results will be presented during an international conference.

ANALYSIS OF SERVICE FUNCTIONS FOR URBAN WATER SYSTEM **MANAGEMENT AND PERFORMANCE MONITORING ISSUES**

Frédéric Cherqui[1,2]
Sébastien Ah Leung[1,3,4]
Selma Baati[1,3,4]
Bernard Chocat[1,5]
Pascal Le Gauffre[1,5]
Damien Granger[6]
Bernard Loubière[6]
Amir Nafi[7]
Céline Patouillard[1,3,4]
Amélie Tourne[1,5,6]
Jean-Yves Toussaint[1,3,4]
Justine Ultsch[1,3,4]
Sophie Vareilles[1,3,4]
et Cathy Werey[7]

KEY WORDS: OMEGA project, sustainability, organizations, urban system functions

A complex legacy to manage

The urban sanitation systems that were developed at the same time as water distribution networks in Western European cities, originated in the middle of the 19th century with a movement to improve hygiene. The early facilities and installations reflected the essentially "sanitary" concept of sanitation (to be taken in the strictest sense: sanitary = favorable to health). The installations mixed wastewater with storm water in the same sewage system that was designed to evacuate all water and effluents away from the city as quickly as possible, which frequently meant channeling, covering, and burying a large portion of a city's natural waterways. At the beginning of the 20th century, the concentration of urban wastewater at one or more points of a waterway began to pose a problem. This prompted a search for a technique to treat the wastewater (which would not become widespread until the adoption of the first water law in 1964), and initiated the principle of separate, distinct sewer systems. However, a complete separation of wastewater from stormwater runoff within the same watershed proved to be difficult, particularly due to wrong connections. From the middle of the 20th century, urban growth associated with a rural exodus brought about a dubious new status to stormwater runoff, that of a threat, one that could suddenly flood an entire city. Technicians developed an approach that Desbordes (1987) qualified as a hydraulic approach that consisted in optimizing the use of the drainage networks and completing them with large stormwater ponds that provided flood protection at peak flows. In the 1980s, it became clear that these so-called "end-of-pipe" approaches were not sufficient to protect cities from flooding. New alternative techniques (or Best Management Practices) were developed in France that were designed to complement the conventional "at-the-source" hydraulic approach, which aimed to control water flows as close to their source as possible. Furthermore, growing environmental concerns focused attention on pollutant flows carried by stormwater runoff and drainage into the combined sewer system (see example of the European Directive ERU 1991 and the water law of 1992). It appears that alternative techniques, in addition to their capacity to regulate water flow, provide a potentially significant means of intercepting pollutant flows, notably those present at a particular phase of stormwater runoff. At the end of the 20th century, new concepts broadened reflection on urban water systems. This initially led to the reintegration of natural water flows – streams that had been buried or covered – followed by the requalification of all urban waters, both stormwater and wastewater, as a resource.

We have thus inherited a complex set of systems that were developed in successive layers, each in response to different needs and issues, which nevertheless constitute a considerable

1_ Université de Lyon
2_ LGCIE – Université Lyon 1, F-69622, Villeurbanne, France
3_ UMR 5600 EVS, « Environnement Ville Société »
4_ INSA-Lyon, ITUS, F-69621, Villeurbanne, France
5_ INSA-Lyon, LGCIE, F-69621, Villeurbanne, France
6_ Lyonnaise des Eaux, Direction technique et recherche, France
7_ GESTE, UMR Cemagref-ENGEES, Strasbourg, France

heritage value. These systems have a variety of technical, regulatory, organizational, financial, and even cultural and social dimensions. They are disparate and managed without any real consultation or communication between systems and players: there are systems for clean water, others for wastewater; systems for urban water, others for field runoff water; systems for utility water and others for natural water.

A profound modification of the challenges

If the systems for managing urban wastewater and stormwater were carefully examined, the outcome of this analysis would be telling:

- These systems must meet an ever more diversified array of needs and demands: flood protection and limiting wastewater discharging into the environment, as well as the reuse of wastewater, the recovery of thermal energy, the utilization of water in urban landscaping, the use of water for bioclimatic purposes, the reintroduction of natural elements in the city, etc.
- The techniques deployed are also increasingly diverse: conventional networks are superimposed over installations for the collection or infiltration of rainwater of all types and sizes, from individual solutions (rainwater tanks, roof-fed cisterns) to large conventional "end-of-pipe" facilities – all requiring better integration into the urban environment. Stand-alone or semi-collective wastewater treatment systems are increasingly professional with tailored regulation and the emergence of highly advanced technical solutions. Collective wastewater treatment systems are also increasingly sophisticated (now integrating real-time management tools, for example). The proliferation of the challenges and the proliferation of the functions have greatly increased the number of solutions and technical measures.
- Much as there is no technical system without organization (Toussaint, 2009), the combined proliferation of functions and measures has led to an increase in the number of organizations actively involved in the management of the system. Sanitation technicians are now to be counted among environmental planners, urban planners, architects, developers, landscape architects, environmental protection groups, and even users, who have once more become a factor in the urban environment. The coordination of numerous organizations that manage a large number of facilities with a wide range of objectives and interests is now problem.

A paradigm shift is necessary

The system has become increasingly complicated and its oversight increasingly difficult. Today, many experts (see, for example, CERTU, 2003; Chocat et al., 2007; Novotny & Brown, 2007) consider that a paradigm shift is necessary and that the concept of urban sanitation should be replaced by that of urban water management. This new approach should integrate four main constraints:

- The management of this "legacy" is essential. In France, according to Berland & Juery (2002), there are 250,000 km of networks – excluding stormwater structures – valued at 85 billion euros, and about 16,000 water treatment plants valued at 15 billion euros, thousands of pumping stations and stormwater overflows, etc. This huge asset must be safeguarded and preserved. The question is how to maintain the integrity of these structures and preserve their functionalities without locking them into their initial role, which must evolve.
- The growing demand for improving the quality of aquatic environments and the recognition of the precariousness of water resources have brought about a consensus on the need for a comprehensive approach to water management. The result is a declared intention to treat these questions at the scale of the watershed, which enlarges the size of the system to be managed, adds new players, and increases the complexity of the system.
- It will also become necessary to take into account (probable) climate changes as well as (certain) urban life styles (with respect to the environment) and different types of urbanization. These changes may be out of step with changes in sanitation systems, given the sector's considerable organizational and technical inertia.
- Finally, the needed changes will not be possible without a renewed organizational approach to the management of urban water systems, in as much as the current approach is still associated with a wide number of associations whose objectives are more or less convergent, with very different organizational modes (local authorities, services, syndicates, businesses, associations, action groups, etc.).

The main issue at hand is the transition from an optimized sanitation management system to the development of a sustainable urban water management system. This means an end to the independent management of different urban water systems (clean water, wastewater, urban water, field runoff water, utility water, natural water, etc.), and it also means envisaging a much wider management scale. **An urban water management system consists of:**

- A set of technical and spatial structures: networks, pipes, drain inlets, treatment plants, retention ponds, septic tanks, grease traps, road systems, banks, beaches, etc.
- A group of organizations responsible for these structures: local authorities, technical engineering design offices, construction companies, management firms, the State, etc.
- A natural catchment area corresponding to the field of influence of urban water management: water tables, rivers, natural urban elements, etc.

The OMEGA[1] research project was created to develop a methodology to help municipalities overcome the difficulties encountered in current urban water management methods and to implement a system of integrated water management. To achieve this, three research laboratories (LGCIE, EVS and GESTE), an operator (Lyonnaise des Eaux) and three local organizing authorities (Bordeaux, Lyon, Mulhouse) were mobilized.

A sustainable urban water management system

The OMEGA project is based on the premise that a transition to a sustainable urban water management system depends on the availability of a multidisciplinary assessment methodology that would allow a cross-cutting measurement of all the services provided by the utilized system. This assessment must take into consideration the environmental, social, economic, political, organizational and technical aspects of the system (Nafi, 2011). The initial work of the consortium led to the proposal of an urban water management system and its functions that are illustrated in the diagram below (Figure 1).

The first deliverable of the OMEGA project (Cherqui et al., 2011) is the detailing of the functions listed in figure 1. The definition of these functions is intended to provide a framework for a comprehensive assessment (or as exhaustive as possible) of the urban water management system. The implementation of this assessment framework necessitates a definition of indicators for each function.

Figure 1. Diagram of the service functions of an urban water management system

System Management Assistance

Of course, the question of service indicators and sanitation system oversight is not new; it has been the subject of many studies for almost thirty years. Three types of approaches have been proposed.

- The guides of good practices or recommendations (CERTU, 2003; Digman *et al.*, 2006; Hall and Lobina, 2009) provide managers with pertinent information, but do not allow an assessment of the quality of the service provided by the urban water management system.
- Another approach is based on the definition of so-called "generic" indicators. The synthesis produced by IWA (Alegre *et al.*, 2006; Matos *et al.*, 2003) is very representative of this approach, which aims to identify performance indicators that are identical and shared by all facilities. Many studies also measure the durability of "urban water systems." Researchers in Northern Europe (Balkema *et al.*, 2002) have often provided the impetus for this approach. Some of these studies have even gone so far as to develop generic assessment tools (Malmqvist, 2003). While the principles are interesting and should be taken into account, the assessment is not comprehensive and fails to take into account all urban water functions, most notably "emergent" functions. In addition, these studies propose specialized indicators for the functions of the facilities (which often don't take into account the functions of the organizations). These generic indicators allow not only a comparison between one region or territory and another, they also serve to provide management transparency. This effort nevertheless faces certain difficulties in that many players (urban organizations and members of the public) may not understand these indicators. The difficulties are not limited to urban sanitation; they exist in every technical solution to urban planning. These solutions are rarely, if ever, proposed for consultation (Vareilles, 2006).
- A local definition of indicators seems indispensable to engage in real consultation (Astleithner *et al.*, 2002). These so-called local indicators are the product of investigations carried out among the players; they integrate or take into account the results of public consultation (service requests, urban activities, etc.). Compiling a list of indicators is however problematic because the definition of local indicators must be compatible with certain indispensable properties: accessibility, reliability, objectivity, pertinence, clarity, accuracy and sensibility (see Labouze & Labouze, 1995 for more information).

Conclusions: toward sustainable management

The management of stormwater and urban water can no longer be considered as a simple urban technique that

1_ Outil méthodologique d'aide à la gestion intégrée d'un système d'assainissement - http://www.omega-anrvillesdurables.org/

"sanitation" engineers assume responsibility for after-the-fact. Wastewater produced by the city must be integrated into the core reflections on the design, organization, and management of the city. Today, water management relies solely on the separate consideration of each system (wastewater, stormwater, drinking water, recreational water, natural water, etc.), but a comprehensive approach to urban water management will soon be indispensable. This does not necessarily mean spatially widening the scope; it rather means taking into account all the urban and natural water-related elements. This requires finding modes of interaction and, most importantly, of cooperation between all the concerned organizations and players within the urban territory and the wider catchment area. The paradigm shift must therefore take into account technical facilities (objects and structures) and organizations (municipalities, water companies, syndicates, groups, associations, etc.) that play role in urban water management. Of course, the stakes are high for the local authorities, the companies in the sector and for all cities. They imply core business changes and the extension of competencies, the adaptation of urban water management organizations, cohabitation between older collective networks and small segmented networks, and the coordination of many organizations while ensuring treatment equity to the users.

As the world faces an economic crisis, a number of major environmental challenges (achievement of good chemical and ecological status of bodies of water, water resource management, energy saving measures, reduction of GHG emissions) will have to be dealt with without significant increases in financial outlays. Only alternative ways of viewing and approaching these problems can possibly lead to finding sustainable solutions. In this context, the OMEGA project aims to provide the operational tools for management services, tools that are indispensable to reach urban water management objectives.

Acknowledgments

This research was funded by the French National Research Agency (ANR-09-VILL-004-01) under the framework of the OMEGA project and the OTHU (Field Observatory for Urban Water Management).
For more information, see **www.omega-anrvillesdurables.org** and **www.othu.org**

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PROPOSED METHODOLOGY FOR ASSESSING THE PERFORMANCE OF URBAN SERVICES AND THE MONITORING OF TERRITORIAL CLIMATE-ENERGY PLANS

Jean Laterrasse[1]
et Seghir Zerguini[1]

KEY WORDS: sustainable development, climate change, indicators, environmental footprint

Introduction

The performance of water services (notably environmental) cannot be simply assessed in an isolated way. As a complex system, the approach focusing on urban centers, with various links between sectors that must be taken into account, tends to take precedence over sustainable development issues. Hence, water services may consume energy either directly for their production, or as "vectors" of consumption (in conjunction with the supply of hot water, for example). They may also occupy large spaces. These different aspects underscore the need for a global approach to performance assessment. Following the lead of other countries, France, following its *"Grenelle de l'environnement"* national environmental conference, now requires local authorities to draw up Territorial Climate-Energy Plans (*Plans Climats-Energie Territoriaux, or PCET*) that detail a coherent set of actions designed to limit GHG emissions and the negative impact of human activity on the environment over the next few decades. The purpose of this article is to introduce a method for the elaboration, monitoring, and assessment of these plans as proposed in the ANR ASPECT 2050[2] project. From this general perspective, the question of the performance of network-based urban services (water, sanitation, waste, transportation, etc.) with regard to the challenges of sustainable development is dealt with using a set of hierarchical indicators that integrate socio-economic, spatial, and energy efficiency criteria. This research project is intended to make these integrated definition and monitoring tools available to local authorities for the deployment of their Territorial Climate-Energy Plans.

Methodology and elaboration of the indicators

The work involves proposing, in light of the best state of knowledge, a set of coherent and hierarchical indicators that would facilitate the identification and assessment of a set of actions to limit GHG emissions, from the most basic to the most comprehensive policies, including sectorial policies. The framework must thus be modular from two points of view: it must be able to adapt to the local context, and be capable of gradually integrating information and data as they are acquired.

The hierarchical framework that was deemed most suitable has four levels, to which levels of actions (or a set of coherent actions) and specific categories of indicators are associated. **Level 1** corresponds to basic actions, and the associated indicators are conventional *monitoring indicators*. **Level 2** corresponds to sectorial actions or policies, and the associated indicators are *structural indicators* (the retained actions are generally intended to carry out structural upgrades to the sector, for example: increase the modal share of public transportation). Status indicators, corresponding to actions or events that are exogenous to the municipality in question (the price of energy or household "equipment" in the form of private vehicles, etc.) could also be introduced, as needed. **Level 3** corresponds to intersectorial policies (integrating potential interactions and economic synergies between sectors), which are associated with *effect indicators* (it is at this level in particular that we have decided to treat the question by means of a cross-sectional study of behaviors). And finally, **level 4** corresponds to *global performance indicators* of the overall urban system.

1_ Laboratoire Ville Mobilité Transport - 9 rue Alfred Nobel, Champs sur Marne, 77455 Marne la Vallée Cedex 2, France - Ecole des Ponts ParisTech - Université Paris-Est.

2_ This project involves a consortium of public research institution (CSTB, EIFER, LVMT) and specialized consultancy (BURGEAP, EGIS MOBILITE, ICE, ISEE, Tracés Urbains).

SECTORIAL BREAKDOWN

The proposed sectorial breakdown contains five sectors: Transportation and mobility; Building and construction; Urban planning; Housing policies and development; Municipal engineering; and Economic and commercial activities. In the present context, two sectors are of particular interest:

Urban engineering

This sector includes the design and management of all the technical urban networks (excluding transportation), and notably, the water and wastewater networks, the waste collection, disposal and processing network, as well as centralized technical management systems (such as the centralized heating management of buildings), and in a broad sense, all local energy policies. It also includes the management of the environment and natural spaces (the development of green zones, for example).

Urban planning, local development, housing policies

This sector includes common activities to develop and rehabilitate the urban environment (building permits, etc.), as well as the setting aside of land reserves. It also includes local housing policies: housing subsidies, attribution criteria (taking into account efforts to reduce home-to-work travel distances, for example).

DEFINITION OF INDICATORS

As noted earlier, there should not be a finite set of indicators, but rather an open, evolving set of indicators. This is particularly true of level 1 (basic actions) as the set of indicators is not meant to be definitive; the aim is to identify pertinent actions and to monitor the implementation as closely as possible. In certain cases, action-associated indicators are required. In other cases (waste processing, local energy policies, etc.), certain local practices or contexts should (or must) be assessed with specific indicators.

We should point out that for each sector we have chosen to place the most obvious generic actions at the top of the list, followed by those that could be qualified as more specific, whose efficacy may be subject to debate with respect to PCET goals.

As regards the creation of a table of indicators:

- First, for each concrete case, we relied on local diagnostics that were shared with PCET stakeholder (elected officials, relevant technical services, companies, associations, users, etc.)
- The next objective (level 2) was to draw up a summary of each sector's sectorial policy (or policies) and a definition of the associated indicators. When sectorial policies are not explicitly stated, it is still possible to work from a set of basic identifiable actions.
- At an intermediate stage in the elaboration of the indicator table, we started from a wide inventory of indicators that seemed relevant. These were then sorted to avoid redundancy and to retain only those definitions that seemed most pertinent, as well as to best identify those that would more naturally be level 3 indicators. For example, the "average distance traveled" indicator is more appropriately a level 3 indicator because it cumulates the effects of sectorial policies in both the urban planning and transportation sectors.

All in all, the approach taken could be qualified as "iterative-interactive" in that it must be validated at each step by and with PCET actors. The retained indicators provide a means for monitoring and a means of communication for all concerned parties, including local residents and users.

The appeal of this approach is partially due to its ability to put into perspective the contributions of each sector to the overall environmental footprint of the city, and to its capacity to bring greater transparency to the decision-making processes so that local residents can more easily play an active role.

Conclusion

CONCLUSION

Solène Le Fur[1]
& Pierre-Alain Roche[2]

The officials in charge of the thematic preparation of the 6th World Water Forum have entrusted the ASTEE to steer the "target and solution group" on the theme of governance and performance of public water and sanitation services. The ASTEE was honored by their confidence as this is a crucial issue – if indeed we aspire to go beyond good intentions and general discussion and actually focus on the realities of providing services to users. It quickly became apparent that the wealth of experience gathered within the working group amply justified the publication of this book. We are extremely grateful to the authors who agreed to make a contribution to this publication despite the short deadline. We particularly wish to thank Guillem Canneva who was in charge of scientific coordination.

While this anthology is certainly far from exhaustive, we think that it reflects a wide diversity of approaches and provides a description of their status. The experiences outlined herein provide an excellent foundation for future progress, but success will require considerable dedication and work over the next few years. This conclusion attempts to highlight a few ideas that may contribute to substantial advances by 2015, without presuming to know what will be discussed during the forum sessions, or the conclusions that will be drawn.

Enhancing the clarity of stakeholder systems and providing them a solid regulatory base

It seems paramount that each country clearly delineates the responsibilities of institutional stakeholders for each aspect of the right to water, and that regulatory frameworks specifying actions to be taken be created.

Promoting and generalizing service contracts or performance contracts

A clear definition of the roles of authorities and of public service operators, and the generalization of service contracts that clearly spell out both the objectives and the resources to be provided by the authorities, constitute a crucial aspect in the organization of services, which serve to better ensure the performance of services provided. Whether services are organized at the local, regional or national level, a clear distinction must be made between the role of authorities and that of the utilities and operators acting on their behalf (public or private). This is essential to clearly enunciate the political objectives and define the means authorities shall allocate to water and sanitation services. A key to performance is the managerial planning of water and sanitation services by officials, notably through the forward-looking stewardship of the infrastructures. This is a prerequisite for the establishment of all contracts with services providers. The contract between the contracting authority and the operator – regardless of the operator's status – is the essential tool that clearly defines this relationship, clarifies the expectations of the authorities and specifies a set of indicators that authorities will used to monitor compliance with service obligations.

Improving decisional transparency and citizen/user consultation

The establishment of clear objectives by the authorizing agency implies enormous political responsibility. The authorizing agency assumes the mantle of ensuring users' access to quality public services. In this regard, it is also accountable to citizens and users. Hence, it behooves the authorizing agency to clearly state the objectives of its water and sanitation policy, as well as the financial means it has allocated to achieve these objectives. This helps satisfy the obligation of transparency to citizens and users, and provides a format for clear instructions to be used by operators along with reference points that will help gauge to what extent the policy goals have been fulfilled.

Boosting understanding of performance issues and the means to be deployed

To better promote these measures, experience has shown that it is best to establish an order-of-magnitude estimation of the expenditures that shall be incurred for the monitoring and performance oversight of services rendered. The drafting of public concession contracts, an understanding of the network and the monitoring and verification of contract compliance requires the mobilization of resources and skills that authorizing agencies may not have at their disposal. The failure to develop and maintain these skills and resources over the long term compromises a clear vision of the performance of their services. It is therefore necessary to assign a portion of the budget to such activities to ensure sustainability and properly calibrate the resources required.

1_ Secretary of the target and solution group, policy officer at the ASTEE
2_ President of the target and solution group, president of the ASTEE

These resources, which are so critical to obtaining the desired levels of performance, are not limited to the developed world. It is rather the number of service beneficiaries and the overall budget of the service that determines whether the resources can be met locally or if it is necessary to pool resources within broader support structures.

Improving and promoting systems for benchmarking

A critical look at existing standardized systems of indicators is essential to improving them, and, by lending them greater credibility, further promoting their use. Service contracts usually include indicators that allow for measuring an operator's performance against the targets they were given. Significant efforts have been made to measure performance with common standardized indicators either at the national level by their own regulators (having themselves varying responsibilities, depending on the country), or at the level of competent authorities and authorizing agencies, or at the regional level. These systems are designed as tools for dialogue and exchange allowing everyone to find their own targets for progress based on a particular, defined situation. They foster the development of systems of observation and performance monitoring by generating standardized sets of indicators. However, these initiatives are often piecemeal and function on different bases and methodologies. While there is an abundance of literature on the subject and manuals of good practices exist, assessments are generally conducted by academic studies on an ad hoc basis, and not regularly over the long term. Also, the results of indicators from two different services are difficult to compare due to differing histories and constraints. A comparison over time of indicators from a specific service can be far more telling and conducive to progress. Finally, most current databases are filled out on a voluntary basis without any means of verification or control.

In general, this contributes to adopting suitable monitoring mechanisms (indicators included) to strengthen and assess water policies, and to create, update, and harmonize databases and information systems to enhance the sharing of data across watersheds, as well as local, national, and international borders.

Promoting networks that facilitate common standards and feedback

It is constructive to encourage institutions and professional association that promote partnerships between operators to include performance indicators in these partnerships, and not overlook indicators to assess the performance of the partnership itself.

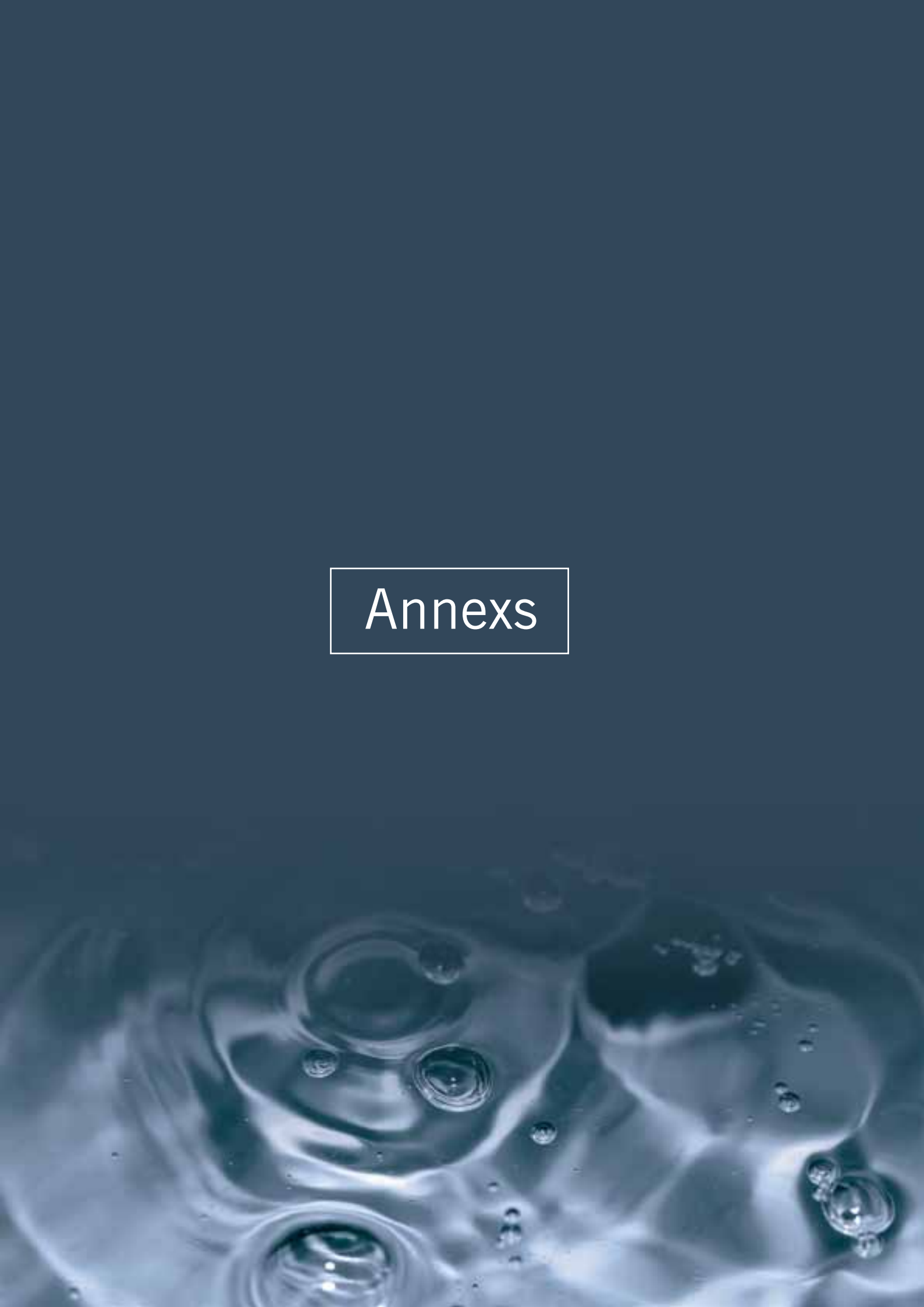
Professional associations (associations bringing together public authorities and operators at national, regional or global levels), play a very active role in implementing performance indicators among their members, and systems of indicators within the various member nations. Their role is essential in both facilitating the homogeneity of the system of indicators, and mobilizing the stakeholders to implement and interpret the results.

When it comes to implementing a system of performance indicators, public service agencies can rely on institutions in its own country, as well as professional associations on the national, regional, or international level. As regards WOPs (Water Operators' Partnerships), it would be advisable to include the development and implementation of tools necessary for the creation of local performance indicators. Professional associations (particularly the IWA and its national affiliates) are involved both in the definition and the implementation of indicator systems, and in the development of these partnerships. They provide valuable support through their network. To enable this support, the creation of long-term budgetary means with the support of international donor agencies is deemed necessary.

Avoiding fragmentation and ensuring coordination between embedded territorial sectors

While the work presented here deals specifically with public water and sanitation services, it should not lead to a fragmented view that focuses solely on those issues. The group's work showed that the performance of water services must be assessed for their capacity to be integrated into a sustainable urban strategy, and they should contribute to the resilience of urban systems in the midst of climatic crises. However, it should also be noted that such strategies only make sense if they are included in an integrated water resources management policy at the watershed level that allows for an equitable sharing of resources and a regulatory system that protects aquatic environments and biodiversity.

Annexs



THE ISTANBUL WATER CONSENSUS

As Mayors and local/regional elected representatives from different parts of the world, meeting in Istanbul in March 2009, we participate in this **ISTANBUL WATER CONSENSUS** to develop water management strategies in the face of global changes.

On the occasion of the Fourth World Water Forum in Mexico, the Local Government Declaration on Water of 21 March 2006 expressed the awareness and responsibility of local and regional leaders concerning water and sanitation and called on national governments for more effective partnership.

We build on previous commitments and express our readiness to take leadership in advancing integrated water management approaches to 'bridge divides for water' and strengthen the resilience of our cities and regions to cope with rising external pressures and contribute to our overall sustainable development.

PART I - Local and Regional Governments' Declaration and Call for Action

With this Consensus, we acknowledge that:

- Access to good quality water and sanitation is a basic right for all human beings and plays an essential role in life and livelihoods, the preservation of the health of the population and the fight against poverty[1];
- Water is a public good and should therefore be under strict public control, independently of whether the services are delegated to the private sector or not;
- Sanitation is equally important as water supply and needs to be given due consideration on the political agenda of local, regional and national governments;
- The local level plays an increasingly important role in the provision of water and sanitation services;
- Rapid global changes such as population growth, economic development, migration and urbanisation, with over half of the world population now living in cities, are placing new strains on water resources and infrastructure and on the systems that supply water and sanitation services to our citizens, businesses, industries, and institutions. These rapid global changes are adding difficulties for the achievement of the Millennium Development Goals (MDGs) on water supply and sanitation[2];
- Slums and informal settlements in and around cities are growing and poverty is increasingly an urban issue, requiring the linkage between access to water and sanitation and land tenure to be urgently addressed;
- Climate change will impact every aspect of the water cycle affecting our citizens: water scarcity will become more exacerbated, extreme events, such as floods and droughts, will increase, the sea level will rise, temperatures will increase, groundwater recharge, rainfall patterns and stream flow regimes will change;
- Water resources management, at the local and regional levels, can be a tool to adapt to global changes;
- The nature, extent and dynamics of water problems show commonalities and differences when comparing the situations in developing and developed countries. While insufficient or aging infrastructure is a challenge for both, financing, strengthening capacity and improving legal frameworks are core concerns particularly in developing countries;
- A new and consistent approach is needed to cope with the demand for water at local and regional levels and to assure mitigation and adaptation measures to face these global changes. Equitable, optimal and sustainable management of water resources and services demands an integrated approach, coordinated action and the sharing of responsibilities by the various tiers of government;
- Sanitation needs to be embedded in overall local and regional planning, linked to other sectors such as drainage, potable water supply, wastewater and solid waste management, carried out – where applicable – through decentralized approaches, and supported by public education and awareness-raising campaigns to improve domestic hygiene;
- Local and regional planning and design needs to be more water-sensitive;
- The public utility/service operator plays a central role in the provision of water and sanitation services and the existing support mechanisms to improve their capacity and strengthen their operation are not sufficient;
- There are costs associated with the provision of quality water and sanitation services. However, access to water and sanitation in sufficient quantity, quality and continuity must be assured affordably and equitably in particular by adapting cost recovery for the poorest people;
- Water use in urban and rural areas is highly interdependent and local sustainable water management plays a crucial role in securing agricultural food production and the prevention of rural depopulation; local authorities must be aware of the importance of rural agriculture, which plays an important role in the provision of food to urban centers.

1_ We strongly support the initiative of the UN Human Rights Commission with regard to the right to water.

2_ The United Nations Millennium Development Goals, which propose to reduce by half the proportion of people without sustainable access to safe drinking water and improved sanitation by 2015, are of direct concern to local governments.

Further, in support of our pledge of action as Mayors and local/regional elected representatives, we call on our national governments and on international institutions to:

- Shift water security higher in national and international policy priorities, based on the principle that water resources must be allocated in a reasonable and equitable manner among all users to support inter-alia, social and health objectives, employment, economic activity, cultural and leisure development and healthy and pleasant environments;
- Speed up the implementation of commitments made on access to water and sanitation and the fight against poverty, particularly in developing countries, in order to achieve the objectives set out in the Johannesburg Plan of Implementation (JPOI) and the Millennium Development Goals (MDGs);
- Establish a dialogue to ensure that Local and Regional Authorities, through an effective transfer of competencies and means, have the legal authority, financial resources, institutional capacity and adequate human and technical skills to manage water supply and sanitation locally and regionally. Respecting the principle of subsidiarity, local governments, in consultation with all stakeholders, should have the option to choose between various management models;
- Involve Local and Regional Authorities in the definition and implementation of political strategies taken at the national and supra-national level for sustainable water management to improve access to water and sanitation and to prepare for climate change and other global changes, particularly in insular and coastal countries. These changes require new infrastructure projects to anticipate climate change-related effects into the design of water, sanitation, storm-water and other urban infrastructure;
- Develop innovative financing mechanisms and regulatory frameworks to facilitate access for local and regional governments to direct financing and increase financing for local water and sanitation infrastructure to address the needs of all people and especially the poor and for adaptation to global changes;
- Include investment in the water sector in their debt reduction operations, such as exchange of debt against water and sanitation investment;
- Put highest attention to the understanding and forecasting of future climate, demographic and other developments affecting the water cycle and management systems at national and regional levels, share the knowledge gained with local governments and help interpret these developments for their relevance at local level;
- Establish effective mechanisms to involve Local and Regional Authorities in the watershed management process;
- Take into more coordinated consideration the impacts of sectoral policy choices on the hydrological cycle that affects rural and urban areas as well as ecosystems;
- Support the international cooperation of Local and Regional Authorities for working towards the MDG targets on water and sanitation, especially through funded partnerships between local and regional governments of developed and developing countries and by allowing – where possible – the allocation of part of the revenues raised from users of water and sanitation services for this purpose.

PART II - Local and Regional Authorities' Commitments

Recognising the urgent need to develop effective strategies, cities and regions depend on appropriate legal, institutional and financial frameworks and availability of capacities, both technical and human. However, climate change, population growth, intensive urbanisation, rapid economic development and other pressures impact local water resources and systems faster than current political and social systems can respond to them.

Therefore, we, as Mayors and local/regional elected representatives, signing this **ISTANBUL WATER CONSENSUS** on behalf of our local/regional governments, express our clear political will to prepare for these challenges by undertaking now whatever is in our current scope of authority and capacities and pledge to do our utmost to contribute to improved water governance and steer our local policies and approaches towards increased sustainability in water management and hydraulic infrastructure development.

This commitment is taken with the expectation that national governments and international institutions will indeed recognise the indispensable role of local and regional governments in improving access and successful adaptation measures in the water sector and will initiate – in the near future – the political reforms that are required to make local and regional governments' efforts technically and legally feasible, fundable and effective.

In order to fulfil our commitment, we will use our political mandate to apply an integrated and participatory approach to sustainable water and sanitation management and initiate the following actions in our city or region based on the Guidelines in the Annex[3]:

- An *assessment* of the internal and external pressures on the local water resources and their aquatic biodiversity in order to identify the main challenges on their conservation;
- An *inventory* of local and regional government policies, strategies and plans that need to be adapted to cope with global challenges threatening local water resources and systems in the medium- and long-term;
- The development of a *dialogue with all stakeholders at the local/regional level* in order to create a shared vision between principal actors, to define local priorities and plans of action in the water sector;

3_ See options for Diagnosis, Targets and Measures in the "Guidelines" section.

- The definition of *objectives and measurable targets* specific to our jurisdiction and reflecting the commitment made to **Istanbul Water Consensus** and the establishment of a monitoring and reporting framework to increase accountability of our strategies and actions;
- The implementation of our action plans to achieve tangible improvements in our water and sanitation services and to increase local and regional resilience in the face of global changes.

We also pledge to report back and share the challenges and the progress of our cities in achieving the above actions at the occasion of the next World Water Forum in 2012.

ANNEX: Guidelines for a Plan of Local and Regional Action (to be tailored to the local context)

DIAGNOSIS

Local and Regional Authorities should develop an assessment of those challenges, which are most likely to impact their water resources and water and sanitation services, including the following, as applicable:

- Undertake an assessment, in cooperation with stakeholders, of likely demographic landuse changes and economic trends and the resulting demands on water resources and compare them with the predicted availability of water resources;
- Determine the population lacking access to safe drinking water and sanitation;
- Determine the population most vulnerable to water-related health impacts;
- Carry out a study on water and sanitation infrastructural needs, including rehabilitation, and their appropriate financing;
- Identify barriers to integrated management including sectoral pressures;
- Assemble the best available climate forecasts applicable to the hydrological factors that impact the city/local authority – from water source to sea;
- Assess the city's capacity to deliver water and sanitation services under major scenarios of climate and global changes.
- Determine other climate-related risks, potential benefits and uncertainties with respect to water management;
- Conduct a vulnerability assessment for pollution and water-related disasters;
- Assess, strengthen and implement regulatory frameworks and enhance institutional capacity;
- Determine the needs for water to support social, economic (both agricultural and industrial), institutional and environmental needs.

TARGETS

Local and Regional Authorities should develop concrete and measurable targets that are tailored to their local circumstances, pursuant to their jurisdiction and on a fully voluntary basis.

Such targets could be, for example:

- Reduce the amount of physical water loss *x* % by year *x*.
- Increase water supply for human needs *x* % by year *x*.
- Increase water supply per capita to *x* liter per day by year *x*.
- Save *x* % of per capita domestic water consumption by year *x*.
- Achieve internationally recognized water quality standards by year *x*.
- Achieve *x* % collection and *x* % treatment of sewage by year *x*.
- Inspect *x* % of industrial wastewater outfalls every year.
- Ensure appropriate amount of water for ecosystems needs by year *x*.
- Reduce damages due to water-related disasters as *x* % of national (and/or regional) GDP to less than 5% of GDP.

MEASURES

To realize targets such as the ones listed above, the following measures might be considered:

- State-of-the-art water, sanitation and storm water management techniques to respond to urbanization and to the uncertainty and variability associated with global changes, taking water supply in rural areas also into account;
- Adoption of measures regarding spatial planning in order to prevent and combat the impact of global changes on the flood risk at the river basin level and on sea rise level;
- Diversification of sources of water supply to provide more flexibility for an indeterminate future, for example, via new storage facilities, sustainable groundwater extraction, water conservation and recycled water or desalination[4];
- Introduction of regulatory measures for public participation in the decision-making regarding water management and financing at local/basin/regional levels thus improving water governance;
- Investment in sustainable infrastructure;
- Reduction of negative water-related health impacts to the urban population;
- Protection of the natural environment, especially important aquatic habitats, against cumulative impacts of urban development and climate change;
- Restriction of land-use to protect water resources and dependent biodiversity;
- Cooperation with industry and the business sectors to optimize water efficiency and reuse in processes and products and to limit, manage and control pollution;

4_ The following local and regional governments requested to keep the reference to inter-basin water transfers: Generalitat Valenciana, Comunidad Autónoma de la Región de Murcia (Spain), Inter Mediterranean Committee of the Conference of Peripheral Maritime Regions(CIM-CPMR).

- Preference to water management solutions that are economical and efficient such as rainwater harvesting and the recycling of purified wastewater;
- Development and implementation of structural and non-structural risk management plans/measures to reduce damage by water-related disasters;
- Development and implementation of plans for flood control, drainage improvements, drought, disaster response and preparation for sea level rise;
- Development and implementation of plans for the redesign and re-engineering of infrastructure, as necessary, to withstand extreme events or to perform under changed circumstances;
- Involvement of women and young people in the supply, management and maintenance of water resources and in risk reduction;
- Utilization of innovative and locally-adapted technologies for increased efficiency and coverage of water and sanitation systems;
- Provision of incentives for the transfer of education, training and technology in order to assure sustainable water management and economic development.

LIST OF **ACRONYMS**

ACWUA	Association des Services d'Eau des Pays Arabes
ADES	Accès aux Données sur les Eaux Souterraines
AFD	Agence Française de Développement
ANR	Agence Nationale de Recherche
ANRSC	Autorité Nationale de Règlementation des Services Publics
AQUEX	Aide à la Qualité d'Exploitation des systèmes d'assainissement
ASTEE	Association Scientifique et Technique pour l'Eau et l'Environnement
AWWA	American Water Works Association
BID	Banque Ineraméricaine de Développement
BRGM	Bureau de Recherches Géologiques et Minières
BSC	Balanced Scorecard
CCAEP	Cellule de Conseil aux Adductions d'Eau Potable
CCSPL	Commission Consultative des Services Publics Locaux
CG	Conseil Général
CIQ	Coût d'Investissement dans la Qualité
CIRED	Centre International de Recherche sur l'Environnement et le Développement
CNDP	Commission Nationale de Débat Public
CNE	Comité National de l'Eau
CNQ	Coût de la Non Qualité
COQ	Coût d'Obtention de la Qualité
CSH	Centre des Sciences Humaines
CUB	Communauté Urbaine de Bordeaux
DDT	Direction Départementale des Territoires
DSP	Délégation de Service Public
EBC	European Benchmarking Cooperation
ENF	Eau Non Facturée
ENGEES	Ecole Nationale du Génie de l'Eau et de l'Environnement de Strasbourg
ENGREF	Ecole Nationale du Génie Rural, des Eaux et des Forêts
EVS	Environnement, Ville et Société (laboratoire)
FNCCR	Fédération Nationale des Collectivités Concédantes et Régies
FP2E	Fédération Professionnelle des Entreprises de l'Eau
GEA	Gestion de l'Eau et de l'Assainissement (laboratoire)
GES	Gaz à Effet de Serre
GPOBA	Global Partnership for Output Based Aid
GRET	Groupe de Recherche et d'Echange Technologique
GWOPA	Global Operators' Partnerships Alliance
IBNET	International Benchmarking Network for Water and Sanitation
ILD	Indice Linéaire de Pertes
INDH	Initiative Nationale du Développement Humain
INDIGAU	INDIcateurs de performance pour la Gestion patrimoniale des réseaux d'Assainissement Urbains
IPC	Indicateur de Performance Clefs
ISO	International Organization for Standardization
ITV	Inspection Télévisée
IWA	International Water Association
JCBU	Jddah City Business Unit
J-PAL	Jameel Poverty Action Lab
JWS	Jeddah Water Services
LDE	Lyonnaise des Eaux
MBA	Master of Business Administration
MIREP	Mini Réseau d'Eau Potable

M.I.T.	Massachussetts Institute of Technology
NPNL	Nam Papa Nakhone Luang
NS	Niveaux de Service cibles
NWC	National Water Company
NWSC	National Water Sewage Corporation
OBA	Output Based Aid
OCDE	Organisme de Coopération et de Développement Economiques
OFWAT	Office of Water services
OMEGA	Outil Méthodologique d'aide à la Gestion intégrée d'un système d'Assainissement
ONEA	Office National de l'Eau et de l'Assainissement
ONEMA	Office National de l'Eau et des Milieux Aquatiques
ONG	Organisme Non Gouvernemental
OTHU	Observatoire de Terrain en Hydrologie Urbaine
PAS	Performance Assessment System
PCET	Plans Climats-Energie Territoriaux
PED	Pays En Développement
PPP	Partenariat Public/Privé
RERAU	REhabilitation des Réseaux d'Assainissement Urbains
RPQS	Rapport annuel sur le Prix et la Qualité du Service
SAGEP	Société Anonyme de Gestion des Eaux de Paris
SCADA	Supervisory Control and Data Aquisition
SCOT	Schéma de Cohérence Territoriale
SDAGE	Schéma Directeur d'Aménagement et de Gestion des Eaux
SEAAL	Société des Eaux et de l'Assainissement d'Alger
SEDIF	Syndicat des Eaux d'Ile-de-France
SEEN	Société d'Exploitation des Eaux du Niger
SEVESC	Société des Eaux de Versailles et de Saint-Cloud
SFI	Société Financière Internationale
SIAAP	Syndicat Interdépartemental pour l'Assainissement de l'Agglomération Parisienne
SIG	Système d'Information Géographique
SLB	Service Level Benchmark
SMEGREG	Syndicat Mixte d'Etudes pour la Gestion de la Ressource en Eau du département de la Gironde
SOMAGEP	Société Malienne de Gestion de l'Eau Potable
STeFi	Suivi Technique et Financier
TSF	Transfert de Savoir-Faire
TSG	Target and Solutions Group
UNSGAB	Conseil consultatif pour l'eau et l'assainissement auprès des Nations Unis
VERI	Veolia Environnement Recherche et Innovation
WIKTI	Water International Knowledge Transfer Initiative
WOP	Water Operators' Partnership

LIST OF THE **TSG' MEMBERS**

COUNTRY	NAME	ORGANISM
USA	ADAMS Ellis	Michigan tech
France	AHYERRE Matthieu	Bordeaux
France	AKHMOUCH Aziza	OECD
UK	AL'AFGHANI Mohamed	Indonesia Law Report/UNESCO
Portugal	ALEGRE Helena	IWA-LNEC
France	AUDIER Marc	FNCCR-Embrun
Guinea	BANTAYA Alpha Oumar	Télimélé
France	BARRAQUE Bernard	CNRS
Marocco	BENSAID Samir	ONEP
	BERNARDINI Francesca	UNECE
	BEROS Marco	BEI
Switzerland	BINGGELI Stefan	EWA/Infraconcept
	BLOKLAND Marteen	UNESCO
Venzuela	BOLIVAR Teolinda	
France	BRENIERE Cassilde	AFD
France	BRITO Antonio	Univ Minho
Argentina	BRUNSTEIN Fernando	Univ Buenos Aires
France	CABASSUD Corinne	Toulouse University
Panama	CABRERA ARIAS Magela	Univ Panama
Spain	CABRERA Enrique	IWA
France	CANNEVA Guillem	ENGREF-AGROPARISTECH
Venezuela	CARO Abelina	
France	CHABERT d'HYERES Laurent	EAU-VIVE
France	CHAGNIOT Muriel	FP2E
France	CHAPGIER Jean	Grand-Lyon
Argentina	CHAVES Fernando	
France	CHERQUI Frédéric	INSA
France	COHEN Agathe	SEDIF
UK	COLBOURNE Jeni	Drinking Water Inspectorate
Colombia	CUERVO Luis Mauricio	Univ de los Andes Bogota
Netherland	DANE Peter	VEWIN
	DANILENKO Alexander	Worldbank
Belgium	DE GUELDRE Greet	AQUAFIN
France	DELAERE Pauline	AMF
France	DELEBARRE Xavier	FP2E
France	GINSBURGER Charlotte	FNCCR
Uruguay	DI PAULA Jorge	
Burkina-Fasso	DRABO Saydou	Bobo-Dioulasso
Argentina	DRAULT Natalia	IRAM I Instituto Argentino de Normalización y Certificación
Republic of Uzbekistan	DUKHOVNY Victor	SIC of Interstate Coordination Water Commission
Germany	DURAND Patrick	BWB
Colombia	ECHEVERRIA Maria Clara	Univ Nat
Cambodia	EK SONN CHAN	Phnom Penh Water Supply Authority-PPWSA
Mauritania	FASSA Yérim	Rosso
Spain	GARCIA - LOYGORRI Adriano	AECID
Scotland	GARCIA QUESADA Monica	IHE Dundee univ
	GASSNER Katharina	World Bank

COUNTRY	NAME	ORGANISM
France	GATIGNOL Chantal	ARS
Albania	GIANTRIS Philip	Water Supply and Sewerage Association
Brazil	GOLDENSTEIN Stela	Sao Paulo
Colombia	GONZALEZ Esperanza	Fundación Foro Nacional por Colombia
Ecuador-España	GUERRERO Carlos	
Argentina	HERZER Hilda	Universidad de Buenos Aires
Togo	HUNLEDE Joachim	Union des Commune du Togo
Germany	JARDIN Norbert	Ruhrverband
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Hungary	KOVACS Karoly	Maszesz/Maviz,
Switzerland	KUPPER Urs	VSA
France	LALLEMAND-FLUCHER Marie-Alice	DEXIA
France	LE JALLE Christophe	PSEAU
France	LEFLAIVE Xavier	OECD
Switzerland	LIEBERHERR Eva	EPFL
France	MAIRESSE Caroline	SUEZ ENVIRONNEMENT
India	MEHTA Meera	Faculty of planning and public policy
France	MENARD Claude	Université Sorbonne
France	MIQUEL Serge	CG Hérault
	MIZELL Lee	OECD
Uganga	MUGISHA Silver	NWSC
Argentina	NOWERSZTERN Marcelo	World Federation of United Cities
Indonesia	NUGROHO Riant	Jakarta Water Supply Regulatory Body
Nigeria	OLUGBOYE Davo	WASH
Brazil	PACHACO Regina	MPGPP da FGV-EAESP
France	PARENTA Renato	
UK	PARKER Sam	WSUP
France	PAYEN Gérard	AQUAFED
Costa Rica	PÉREZ Marian	FLACSO
France	PERROUIN Jean-Luc	Nantes-Métropole
France	PINATTON Mélanie	AFNOR
France	PINCEAU Pascale	
Brazil	PINHO Raul	Inst. Trata Brazil
Colombia	POLONIA Beatriz	Superintendencia De Servicios Públicos Domiciliarios
England	PURCELL Milo	Drinking Water Inspectorate
France	REDAUD Jean-Luc	Ministery of Agriculture
Perù	RIOFRIO Gustavo	DESCO
Chile	RODRIGUEZ-ARRANZ Alfredo	SUR, Santiago De Chile
France	ROTILLON Sylvain	ONEMA
France	SALVETTI Maria	ONEMA
	SANDOVAL MINERO Ricardo	WIN- Consultant MAV, S.C.
France	SAULUS Geneviève	Eau de Paris
Belgium	SCHRODER Robert	VeWIN
Chile	SEGOVIA Olga	SUR
Portugal	SILVA COSTA Francisco	Département de Géographie de l'Université de Minho
Spain	SOLER Manuel	Adecagua, Barcelona
France	TABUCHI Jean-Pierre	SIAAP
France	TCHENG Jacques	Grenoble water public service
Italia	TERRIBILE Flavia	Ministero dello Sviluppo Economico
France	TISSERAND Bruno	ISO
France	TORTEROTOT Jean-Philippe	EWA

COUNTRY	NAME	ORGANISM
Ivory Coast	TRAORE Karim Sory	Université d'Abobo Adjamé, Abidjan
France	TREMOLET Sophie	Tremolet consulting
	VAN DER BERG Caroline	Worldbank
Italy	VANIN Elisa	Fondazione per l'Ambiente « T. Fenoglio »
Bolivia	VARGAS Humberto	CERES
Ecuador	VASCONEZ Mario	Quito
Mexico	VAZQUEZ Eduardo	
Ecuador	VILLAVICENCIO Gaitan	Univ Andina Simon Bolivar
France	WEREY Caty	ENGEES
France	WITTNER Christophe	CEMAGREF
Perù	YAÑEZ Samuel	CIPAD
	YOKOTA Taeko	UNhabitat

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NAME	ORGANISM
BANOS Eva	AQUAPUBLICA (Belgium) - TARGET1
BASTEMEIJER Teun	WIN - CS1
BEGORRE Henri	Maxeville (France) - PFE
BELLAUBI Francesc	TISDA/TI Berlin -TARGET 5 (Germany)
BRAILOWSKY Alexandre	SUEZ -TARGET 1 (France)
CHOCAT Bernard	ASTEE
De LAVERGNE Célia	ASTEE (France)
GATEL Dominique	ASTEE (France)
GENDREAU Nicolas	CU Bordeaux (France)
LE FUR Solène	ASTEE (France)
MAITREROBERT Xavier	AQUAFED
MALMQVIST Alexandra	WIN -TARGET 5
MAREST Philippe	Nantes Métropole
MICHEL Eric	Veolia Eau (France)
ROCHE Pierre-Alain	ASTEE (France)
SIMONET Stéphane	6th WWF secretariat
TROPP Hakan	SIWI -TARGET 6 (Sweden)
VALENSUELA Daniel	OIEAU-CS1
VILLESSOT Daniel	ASTEE (France)
WOUTERS Patricia	IHE-help desk Univ DUNDEE (Scotland) - TARGET1

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Printed in France in March 2011

ISBN n° 9782952668385

"Water" photos: © Fotolia.com
Graphic design & realisation: id bleue - 02 43 95 48 37 - www.idbleue.com

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