



WATER UTILITIES LEADERS FORUM  
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**Position Paper for Session 1 -  
*“Looking at the Big Picture: The Importance of Planning for  
Water Utilities”***

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1. Clean water is key to the formation of stable human societies and reliable supply of water is one of the main basic ingredients for human development. Without clean water and secure supply, no stable modern highly developed society would exist. Fact is that all well-developed communities have solved these two key issues: clean and secure water supply. Thus, water planners and managers are in a pool position for safeguarding the current healthy situation and assuring a prosperous future of their customers by sustainably managing water resources. This means ensuring adequate and reliable supply of good quality water to the consumers, and anticipating the future with adequate water infrastructures ahead of demand. Three key aspects to successful planning for water utilities are discussed in this paper. They are 1) defining a clear vision, 2) embarking on long-term strategic planning, and 3) ensuring an adequate governance structure.

### **Defining a Clear Vision**

2. A vision defines the “what” rather than the “how”, and has to consider all aspects of economic, environmental and social relevance. In other words, a vision defines the final objective or the goal that is desirable to be achieved. In fact, a compelling vision energises a utility’s employees and focuses employees’ efforts towards achieving the vision as a team. Today, there are already many utilities worldwide that set clear visions and adhere to them, to better serve the community and public.

A vision for water utilities is very likely to cover aspects like:

- Safe and 24/7 piped water supplies for all
- Safe and dignified sanitation for all
- Contribution to a clean environment
- Healthy and financially independent water and wastewater services
- Business excellence
- Customer focus
- Forward thinking

Some examples of visions are: PUB, Singapore<sup>1</sup> - ‘Water for All: Conserve, Value and Enjoy’; Sydney Waters<sup>2</sup> - ‘Valued Water Solutions’; and DC Water – ‘Provide world-class water and wastewater services as a leading steward of the environment’

3. A clear vision is important and crucial to establish long-term strategic plans and shorter-term delivery plans. Strategic plans<sup>3</sup>, which essentially outline a chronological series of activities used to achieve the vision ie. meet water demand 24/7, are sometimes referred to as masterplans. The strategic plan must be developed to cope with changing needs as a result of demographics, urbanisation, life style and land use shifts, industrial and private sector development, and natural calamities such as drought, pollution of reservoirs,

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<sup>1</sup> PUB, Singapore, Mission & Vision, <http://www.pub.gov.sg/about/Pages/MissionVision.aspx>

<sup>2</sup> Sydney Waters, Sydney Water Graduate Program 2014, Explore the Possibilities, <http://www.gradconnection.com.au/sydney-water/graduate-jobs/science/>

<sup>3</sup> The strategic plan should be reviewed at a frequency to match detailed planning which covers the detailed deliverables for a period (~ 3-5 years), although major resource infrastructure requires a longer time horizon.

earthquakes, etc. Strategic plans align both planners and operators. Ideally, these plans are to be rolled out at a steady and timely pace. Time scales of most strategic plans usually go beyond the tenure of many governments and political leaders. The resulting formidable challenge is to maintain the buy-in and agreement of the political stakeholders.

**Question 1:**

**How do we get the political stakeholders to believe and stay steadfast to the vision and its implementation?**

4. The support for the strategic plans must come from all stakeholders - the authorities, the public and other beneficiaries like service institutions and industry. Robust and long-term support from all stakeholders can only be obtained by being highly transparent and trustworthy with a thorough communication strategy. Such a strong support is the best protection against short-term changes of political priority settings eroding the goals set by the strategic plans.

**Question 2:**

**How best to lead a public campaign to keep water and its sound management high on the public agenda for many years and decades?**

**Embarking on Planning for Water Utilities**

5. Vision and the long-term strategic plan are flipsides of the same coin. A clear vision is the basis for developing a long-term strategic plan, and in turn the vision is supported by a well-developed long-term strategic plan. To develop a strategic plan, planners first take stock of the existing infrastructures followed by estimating projected water demand and used water discharge. These estimates are made based on existing land use plans. Once estimations are finalised, planners check the adequacy of existing infrastructures. In the event that existing infrastructures are inadequate, expansions of water network / sewerage or treatment / production plants are deemed necessary and are proposed for implementation. During this phase, planners should ideally consult and coordinate with other infrastructure agencies / companies to determine and resolve possible conflicts in infrastructure planning.

6. For each of the proposed expansions, planners have to take into thorough consideration the following:

- availability of funds and land;
- technology to adopt for the new expansions;
- ability of proposed expansions to sustainably meet water demands and deal with increased amounts of used water;
- alignment with the overall planning and development policy;
- avoidance of any far-reaching negative impact on other plans or the environment;
- coordination with other development plans concomitantly or nearly concomitantly implemented to benefit of synergies and economies of scale;
- conflicts with infrastructure plans from other developing agencies;

- public interest and the possibility to resolve differences through public consultations; and
- climate changes impacts which typically raise complexities, uncertainties and demands on infrastructure performance

7. Planning is not simply a (treatment / production capacity) numbers balancing exercise. Thorough knowledge and experience (gained through ground experience) are needed about the technical, economic and environmental aspects of water infrastructures and their interactions with other infrastructures. To be successful, planners should ideally have previous operational and hands-on experience working in a plant or maintaining water networks / sewerage.

**Question 3:**

**What are some of the resources required in developing a well-rounded and robust plan for water utilities and who are the key actors to be involved?**

8. Long-term strategic plans are developed, continuously reviewed, adjusted to new insights and changing technical, economic, political, environmental opportunities and challenges. Meeting the objectives on a rolling basis requires a high degree of flexibility and adaptability from operators and water resource managers. The successful implementation of WMPs and its realization in the everyday management of water and its infrastructure is influenced by a number of strong factors. These considerations are above all the availability of the resource water and the necessary financial means. However, the successful water management may be at stake without the full approval and continuous strong support of Water Utilities' Board of Directors, the detailed knowledge of the state of water infrastructures, and the availability of the energy necessary to maintain and run continuously water infrastructures.

a. Water Utilities' Board of Directors

One of the most important stakeholders in water management is the Directors / Board members of Water Utilities. Typically Directors / Board members come from and return to politics. They are likely to be driven by political concerns to keep expenditure low, to minimise land use for water infrastructure, and to shift priorities away from infrastructure maintenance. Securing a continuous adherence to the Vision, strategic plans by the senior management can be a considerable task for the technical managers. Failing in doing so may lead to water infrastructure degradation. Only the full backing by the senior management and political leaders will assure sustainable, safe and secure water supply and wastewater collection. A perfect example is the Metropolitan Waterworks Authority (MWA) and Bangkok Metropolitan Administration<sup>4</sup> (BMA), which are both enjoying strong support from the national government and from the Thai Royal Family.

b. Aging Water Infrastructures

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<sup>4</sup>The BMA's Department of Drainage and Sewerage (DDS) takes care of both storm water discharge, and wastewater and sludge disposal.

Cities such as Philadelphia and New York City are experiencing aging and leaky water pipes. Unlike the collapse of a bridge or power blackout, water pipe breakages are very local events. They go largely unnoticed. The U.S. has 240,000 large water pipe breaks per year, about 650 every day, or one every two minutes.<sup>5</sup> For the US EPA preventing pipe breakages is one of USA's top water priorities. EPA is focusing its research on: (i) increasing the lifespan of potable water and wastewater systems, (ii) determining the causes of failures, and (iii) searching for ways to prevent future malfunction of water infrastructures. Since water infrastructure is largely underground, traverses large above ground infrastructures and congested areas, maintenance and replacement is not trivial. In New York City for example, the City Water Tunnel No. 1 (commissioned in 1917) and the City Water Tunnel No. 2 (commissioned in 1936) are both urgently in need of maintenance. However, any form of maintenance work to both City Water Tunnels is not possible until the new City Water Tunnel No. 3 is completed. Construction began in 1970 and is expected to be completed not before 2020, more likely later. The reasons for the long construction time are complications in consideration of the aboveground urbanised areas<sup>6</sup>.

c. Energy Dependency of Water Utility Companies

Operating water infrastructures is heavily dependent upon energy. In its absence, pumps cannot be used to channel water to their destinations, chemicals cannot be transported to treatment plants to properly treat water and wastewater, and information technology will not be available to assist operators in running their utilities. In Singapore, energy consumption has risen with increasing utilisation of membranes (in membrane bio-reactors) and pumping of water from underground retention tanks at treatment plants. Membranes are used to produce better quality effluent / water, deeper tanks are constructed to reduce land take of water infrastructure in land-scarce Singapore. To counter Singapore's dependency on energy, in-house energy production from biogas in wastewater plants have been practised for years. Currently PUB Singapore is researching and developing low-energy water treatment processes, such as the use of biomimetic membranes for desalination.

### **Good Governance Structure**

9. Although water is a local issue, it involves numerous stakeholders at (river) basin, municipal, regional, national and international levels. Without effective governance to manage inter-dependencies across various government levels, policymakers and planners cannot develop sound policies, implement effective planning and build water infrastructures.

10. Good governance is critical to the success for water utilities. Three elements largely determine good governance, namely (i) effective administration of multi-level governance;

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<sup>5</sup> Xylem Inc (ITT Corporation), "Failing Infrastructure & Water Scarcity" article, [http://www.xylem.com/valueofwater/media/Failing\\_Infrastructure\\_and\\_Water\\_Scarcity.pdf](http://www.xylem.com/valueofwater/media/Failing_Infrastructure_and_Water_Scarcity.pdf)

<sup>6</sup> David Grann, "City of Water" article in the New Yorker, [http://www.newyorker.com/archive/2003/09/01/030901fa\\_fact\\_grann](http://www.newyorker.com/archive/2003/09/01/030901fa_fact_grann)

(ii) clear roles, responsibilities and lines of decision-making; and (iii) inclusion of public in water policies and planning.

a. Effective Administration of Multi-Level Governance

There is a very sensitive balance between top down planning and bottom up involvement for governance framework development. Failure of involvement of all stakeholders will often result in great resistance on the ground. In Kyrgyzstan, the development of a new Water Code began in 2000 and it was approved in 2005. After the approval of the Code by the Parliament, it lacked ownership from the water experts and the initial implementation phases were unsuccessful<sup>7</sup>. There is certainly no one-size-fits-all solution. Societal, cultural, historical and geographic differences make a unified procedure model impossible. With such inflexible approaches in managing the local utilities being practiced for years, there are growing pleas for area-specific and locally developed policies and plans that can well serve the local needs. A thorough understanding and consideration of local conditions and needs as well as how local utilities (if existant) address their water issues is certainly helpful when changes need to be implemented.

The growing implementation of the subsidiary principle (policy making decisions should be made at the most decentralized level closer to citizens and where most local knowledge is readily available) has strongly changed the decision making process of governments and is beneficial to water resource management. The water metabolic system<sup>8</sup>, which proposes to produce and supply fit-for-purpose water, would best function under highly decentralised conditions. In a decentralised decision-making system, the operators or utilities, which are closer to the consumer, would not over-treat water to standards that are actually not required by the consumers. This clearly would reduce the energy, manpower and infrastructural needs for water treatment.

The subsidiary principle has empowered agencies as knowledge carriers or regional and local authorities to formulate their own policies and plans to better customise solutions. One good example for the empowerment of agencies is the US EPA. It is allowed by the Federal Clean Water Act (CWA) to authorize the National Pollutant Discharge Elimination System (NPDES) Permit Program to state governments. This in turn enables states to administer and issue NPDES related permissions and enforce the permits. US EPA still retains oversight responsibilities on water quality for all the states<sup>9</sup>.

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<sup>7</sup> Jenniver Sehring, "Path dependencies and institutional bricolage in Post-Soviet water governance", <http://www.irsa-world.org/XII/papers/28-3.pdf>

<sup>8</sup> Prof. Norihito Tambo, "Urban Metabolic System of Water in the 21st Century" presentation slides, March 18, 2003

<sup>9</sup> U.S. EPA, Overview of NPDES Program, Data Collection, and Information Sources, What is the NPDES Permit Program? section, <http://www.epa.gov/oecaerth/data/results/performance/cwa/#a>

**Question 4:**

**How can utility leaders stimulate water policy integration within administrations? Should the state or regional utilities be empowered to tailor-make their own policies and plans? How should utilities interact with their governments on proposed policies and plans?**

b. Clear Roles, Responsibilities and Lines of Decision-Making

Clarity of roles and responsibilities is needed for all levels of technical and political organizations: from top management to lowest rung technical operator and from municipalities, regions, nations to multinational bodies. “Silo” mentality is detrimental and unrewarding in the water sector because water issues are most often highly complex, cross-cutting in nature requiring interactions and sharing across different government levels, departments and divisions.

**Question 5:**

**How can communication across government levels and across departments’ best be promoted? What works best - job rotation, secondment or periodic updates?**

c. Inclusion of the Public in Water Policies / Planning

The public is usually the most important stakeholder for water and water management. Top down decisions with little information to the public might have been tolerable to a certain extent in the past. Internet and mobility make increasingly information available to everybody who wishes to be informed. Lack of transparency and early active information will result in resistance and anger of the citizens. Inclusiveness in planning and decision making promotes ownership by the public of their water infrastructure and its management, and results in a much higher acceptance for conservation measures and pollution prevention. In recent years, some governments have adopted a more consultative approach in formulating policies and plans. For instance, European Commission’s Consultation on Policy Options for the Blueprint to Safeguard Europe’s Waters (2012) asked the public for its views on the most appropriate actions to improve water management in Europe and to safeguard water resources for all users (consumers, agriculture, industry and nature itself). The public’s views is thought to help better to formulate the policy proposals to be included in a Blueprint to Safeguard Europe’s Water Resources planned for the end of 2012<sup>10</sup>. The target groups include water experts, public authorities, practitioners in utilities, consultants, etc.

**Question 6:**

**How can clarity and transparency to public and other agencies of decision making process be improved? To what degree is transparency and inclusiveness decisive for policy development and planning?**

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<sup>10</sup> European Commission, “Consultation on Policy Options for the Blueprint to Safeguard Europe’s waters”, [http://ec.europa.eu/environment/consultations/blueprint\\_en.htm](http://ec.europa.eu/environment/consultations/blueprint_en.htm)

11. It is the government and water utilities' duties to ensure that water continues to flow in excellent quality to homes, commercial premises and industries for the sustenance of life and all human activities. Increasing danger of environmental degradation, higher pressures on ecosystems, greater risks of extreme events well or not triggered by climate change, asks governments and utilities to expand their responsibilities. Finding environmentally sound, economically viable, and socially acceptable solutions demands an even higher excellence of the responsible organizations.

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