

**BRAINSTORMING SESSION ON WATER GOVERNANCE**  
**Lee Kuan Yew School of Public Policy**  
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**INTRODUCTION**

A brainstorming session on water governance was organised by the Institute of Water Policy of the Lee Kuan Yew School of Public Policy, Singapore, and the Third World Centre for Water Management, Mexico. The principal objective was to set the foundations for formulating a priority research agenda on water governance taking into consideration the views, knowledge and experience of experts from different countries and with diverse backgrounds and disciplines. Participation to the brainstorming session was by invitation-only. The experts were selected exclusively on the basis of their knowledge in the field of water governance. They were invited in their personal capacities, and thus all the views expressed were their own, and not of their institutions.

Before the session, the participants were requested to send in advance an outline of their personal views on what they considered to be the three priority issues of water governance, as well as the reasons thereof. The views of all the participants were circulated to the entire group.

The brainstorming session started with brief presentations on the critical issues each expert had proposed earlier, justifying the rationale behind the selections. Following these presentations, there were in-depth discussions on the overall issues of water governance. Finally, each one of the participants identified only one specific priority area of research on water governance, explaining the reason why he/she considered it to be the most important area from the own perspective.

The discussions were wide-ranging and considered different issues, approaches, successes, failures, constraints, road maps, and research agenda on the overall topic of water governance. In order to focus the discussions even further, two questions were posed to the group. These were as follows:

- what in their view were the two most important issues related to water governance, and
- what did they consider to be the two most important issues in terms of research in the area of water governance?

Following is a summary of the discussions. The names of the participants and the priority issues presented by them are attached as annexes I and II.

## **VITAL ISSUES AHEAD FOR WATER GOVERNANCE**

The group discussed a diverse series of topics based on their broad knowledge and years of experience. Issues such as policies, institutions, regulations, paradigms and their implementation, development of infrastructure, tariffs and subsidies, use of technology, as well as capacity building were considered to lie at the heart of water governance problems.

It was recognised that in most of the developing world, policies currently in place have not reached the expected results in terms of water management and governance due to reasons that range from the usual constraints like short-term planning, shortage and inappropriate use of financial resources, and lack of institutional and human capacities. However, a main lacuna was considered to be the lack of vision to develop a strategy that goes beyond the short-term political and economic considerations and focuses on the long-term needs of the water sector for alleviating poverty, improving quality of life, and protecting the environment. Other reasons identified were inefficiency inherent in public expenditure on water services, subsidy regimes that do not promote innovative ideas, water organisations that do not attract or retain staff with skills required for efficient service delivery, and legislations and regulations that lack the necessary implementing instruments.

For the countries in the developed world, even though the water sector provides better water supply and sanitation services, there are still management issues which need accelerated attention. Some examples include water quality problems, mainly in terms of lack of control of non-point sources of pollution, and the overall inability to coordinate the management of water resources with other resource sectors and development- and environment-related issues.

Issues that are equally relevant for both developed and developing countries include insufficient investment for infrastructural development and rehabilitation, inappropriate coordination and communication between and among agencies, and lack of effective mechanisms for effective participation of different partners or stakeholders at different levels of decision-making. A main problem identified is the lack of realisation that water is a cross-sectoral issue, and thus, that its governance increasingly depends on policies in other sectors.

There was a general consensus on the need for critical, objectives and in-depth case studies of urban water governance, the reasons for their success and what have been the governance processes used. Only with such an approach, it will be possible to identify diverse models of urban water governance that could be considered for possible use in different parts of the world, with appropriate modifications to suit site-specific local conditions.

While the experiences and priorities of the different experts varied, some clear themes emerged as vital areas of concern for the future in terms of water governance.

## Holistic views

Holistic approaches are considered to be of fundamental importance to natural resource management, including water. However, both developed and developing countries have faced, and continue facing, serious constraints which have made implementation of the current paradigms either impossible or exceedingly complex. For decades, water management trends have included, at least in theory, the implementation of concepts such as sustainable development, river basin management, integrated water resources management and now lately, water governance approaches. The drawback has been that none of these paradigms have thus far rendered practical results at a perceptible scale. This should encourage water policy-makers, managers and users to rethink on how these paradigms could be modified, or even replaced, so that they are implementable under different contexts. Rather than naively assume that it would be possible to achieve the implementation of any of these paradigms without drastic changes at least at the institutional and legal levels, it would be more practical if policy-makers, managers and practitioners made an effort to prioritise their requirements, objectively identified the constraints on the implementation of the current paradigms and how to overcome them, and then focused on improving management and governance of water resources.

So far, inappropriate and inefficient resources management practices often prevail; a long-term futuristic vision for a much needed broader perspective on key-issues related to management of water, and institutional arrangements and coordination between resource policies of various sectors are missing; performance indicators are often disregarded; there is questionable public sector leadership, and there is almost no consideration to develop new capabilities and knowledge to identify long-term water governance issues which will certainly be very different from present and past issues.

Additionally, despite the fact that the policies on water, agriculture, energy, industry and environment are closely interlinked with each other, the water is managed as if it was independent from all other sectoral issues. In fact, the missing link between the water sector and the other sectors is one of the big gaps in the management and governance of the resource that will have to be addressed sooner than later. Tackling problems, individually or partially (for example without explicit consideration of land use and other related issues) has been the practice for years mainly because of administrative, institutional and legal ease, but experience has shown that *status quo* will not yield optimal results in the future. Decision-makers thus need to develop a holistic systems approach that improves water governance and which benefits the society significantly.

Political will is needed to ensure that water resources and urban planning are planned and managed strategically in relation to the development of the cities as a whole. This may sometimes mean safeguarding the resource from developmental pressures. For example, Singapore has protected the central catchment area even when it has faced pressure from developers, because of its expected need for higher increased water requirements in the future. Part of good water governance therefore, has to come from balancing land and water resources in terms of future development plans, an issue which will make the governance of water increasingly difficult and complex in the future.

A holistic view of the governance of the urban water resources could include the consideration of the human access to clean and drinkable water from the tap. This issue, as well as the development of strategies to deliver services to every one, especially the poor, have a lot to gain from an efficient system which includes not only reliable provision of clean drinking water but also fair and equitable water pricing for people at all socio-economic levels. What is needed is universal access to clean water at affordable prices for the totality of the population and it can be achieved with a better governance of the water sector.

The holistic view of the governance of water resources should also allow policy-makers to take virtual water into account. Neglecting this component of water could be an economic miscalculation since it may not reflect the true costs (or price) of water. The concept of food self-sufficiency of nations should give way to ensure food security, with consideration of water requirements for the agricultural sector.

The increasing complexities of the problems associated with efficient water resources management and governance, and accelerated societal interest in water-related issues, have necessitated a broader and systemic approach which cannot be provided by the engineers and/or by the economists alone. By broadening the participation of other disciplines and stakeholders in addition to the public sector at the central levels, this may result in consideration of different alternatives, which the present institutions are unable to frame and consider so far.

It is thus necessary to consider different forms of partnerships – with industry, business as well as the public, for example, the 3-P model in Singapore, where “people” are included in the equation. Transparency and dissemination of information are important and necessary to be tackled from the beginning of every important process. It was generally agreed that there is a lack of awareness among the people on the critical nature of water issues that the world is facing. The debate thus tends to be over trivial issues. Engagement of local communities and sharing ideas and information on the implications of the decisions taken are important consideration in obtaining public support. The challenge is how, if and when, the governments should delegate specific responsibilities for provision of water services and the governance of the system to communities with the objective to assure ownership, and still provide the necessary technical support and management capacity. This probably will require a clear message on regulations, as well as the explanation of basic arguments and key ideas, as well as the introduction of incentives and disincentives to encourage responsible behaviour, whether on the part of the industry, the business or the individuals.

The appropriateness of the participation of different stakeholders and the roles they could or should play according to their capabilities, interests or relevance, also add to the complexity of good water governance. Participation in the water sector is an issue that has been widely discussed and promoted at the various national and international levels. Irrespective of the rhetoric, however, not very much has been achieved to ensure its implementation or prove definitely that stakeholder participation always improves water governance. Thus, the question that needs to be asked and answered is if stakeholder

participation has become an end by itself or if it is one to achieve good water governance. If it is the later, many fundamental issues still need to be researched.

Institutions at the international, national, regional and local levels have yet to realise that in order to achieve an effective and realistic participation by the society, many other needs like education, training, information and communication must be met concurrently. Participation for the sake of participation may produce results, which may not necessarily be beneficial for good water governance: it may even prove to be counterproductive. These are difficult issues which need to be researched. Also, it is necessary to consider how best to reconcile the different interests of the stakeholders which often could be polar opposite. Without clear ideas of processes available to mediate such difference of interests, stakeholder participation has the potential to improve the governance system but also to produce complete paralysis.

## **Institutions**

Properly structured and managed institutions can accommodate mixed demands and interests, not only from the public sector, but also from the private sector, academic and research institutions and NGOs. Institutional arrangements can directly contribute to the success or the failure of the formulation and implementation of good water governance, and also to the design, execution and management of water projects.

A well-structured and properly functioning institution has the potential to ensure a more effective participation of the society, who, in turn, may become more responsive and participative, resulting in a “win-win” situation for all concerned. Furthermore, well-functioning institutions should be able to reach both the macro- and micro-levels of any society in terms of policies and services. Institutions can also assist in improving human welfare through better services, generation of employment, advances in knowledge, education and training, dissemination of information and improved communication. The roles the water institutions can play in the future through their interactions with the institutions of the other sectors and various societal groups, could indicate how much these institutions, as well as the community in general, can contribute to improve the quality of life of the population, promote social cohesion and protect the environment, through the good governance of water resources.

In terms of water governance in the urban areas, many failures can be attributed to poor institutional and financial structuring of programmes and projects. Regarding governance of water utilities, there was a general consensus that the structure of the utility often could be less important than whether it could meet key objectives such as production and delivery of high quality drinking water, be financially viable, and follow sustainable business models.

Water tariffs emerged as an important requirement of good and sound water governance. Generally, tariffs cover about 10 per cent of the total operating costs of many water utilities in the developing world. Several arguments were thus made on the need to price

water properly. First, if there is no tariff reforms, there is little capital investments in water infrastructure since governments simply do not have adequate or unlimited resources to provide heavily subsidised water. Second, and tied to the previous point, is the relatively backward nature of technology in water since there is no market incentive for innovation given the low rates of returns. Third, from a consumer point of view, if there are no tariffs, there are no incentives for conservation.

Institutions also need to be accountable. An important issue to discuss is accountable to whom: elected representatives, governmental checks and balances or general public, since the different groups will require different type of information for accountability requirements.

It was also noted that there should be clearer implementation and planning guidelines and that so far there is very weak articulation of specific policy targets and outcomes with respect to service delivery. Even where these goals are defined, follow up activities to achieve them remain sporadic. Too often, accountability takes the form of building an asset, whereas the important tasks of maintenance and acceptable service delivery continue to receive inadequate attention.

Institutions are also needed to ensure access to clean water for the people who may not afford to pay for the full price for the service received. Issues of equity and poverty could thus be of structural nature. For example, governments often underestimate the actual cost borne by the people in getting access to water, such as collecting water from wells and rivers, or paying for them from providers at high costs for poor quality water. There is often the erroneous perception among many politicians that there is a heavy political cost for charging the full price for a reliable supply of water when, in fact, this could actually result in increasing public support since many people may have to pay higher economic and social costs from buying poor quality water from private water vendors which supply is also unreliable.

Hence, strong institutions which are governed, planned and financed adequately are vital for providing reliable water services. This includes changing the system with general heavy subsidies to one where there is full cost recovery with subsidies targeted only to the poor.

Finally, the study of water institutions needs to be governed by good information. This includes reliable data on water supply-demand relationships, as well as related indicators, which would provide benchmarking for common understandings and inter-utility comparisons. At the same time, there should be objective analyses of current practices in order to learn from them.

### **Linkages and drivers of change of the water sector**

There are increasing numbers of linkages and drivers of change which are already having an impact on the water sector and its governance. These driving forces include not only

population and urbanisation, economic growth, energy generation and agricultural production, but also far complex issues like globalisation, free trade, immigration, advances in technology (biotechnology and desalination, for example), changing management paradigms, and evolving social attitudes and perceptions. Water is increasingly becoming a central consideration for food, energy and environmental securities and thus is having significant implications for future human development at the global, regional, national and sub-national levels. As such, it is essential that policies and strategies for the water sector are not developed in isolation, as it is mostly done at present, but viewed in a holistic and systematic manner so that their impacts on other sectors are considered, and vice-versa.

The pace at which changes in development and technology are happening at present in the world makes it essential that the implementation of changes in water governance can match the constant evolution of the other sectors. However, the required reforms in the governance of the water sector are taking place very slowly, partly due to the lack of administrative capacity but also partly due to the lack of incentives or interests for actors to change, an issue which may be economic in nature but which also may be related to leadership capabilities. The slow pace of formulating a much needed vision for the future governance and management of water, which can actually be implemented, is now a major constraint.

Within the water sector itself, it is necessary to link efficiently the several diverse components of the water supply, reuse and sanitation loop, with administrative and financial strategies along with a decentralised decision-making and implementation at the appropriate regional or local levels. Administrative decentralisation can be very effective if successfully implemented along with financial and technical decentralisation. Any such process, if it is to be effective, will require building up of the local capacity. Otherwise, there can only be an extension of bad governance, with the expected poor outcomes.

## **RESEARCH AGENDA FOR WATER GOVERNANCE**

During the brainstorming session, each participant was requested to identify one priority research area of water governance (the areas recommended are listed as Annex III). After the participants gave their choices, there was an overall discussion on what should be a priority research agenda. From these discussions, following areas of priority research on water governance are proposed for the Institute of Water Policy and its current and future partners. They are not presented in any specific order or priority because their importance and relevance may vary from one country to another.

It is vitally important that research conducted will provide fundamental theoretical basis for a conceptual framework of water governance that is implementable. By developing a research agenda on water governance and with the results obtained, the Institute of Water Policy has the potential to shape how water is governed in the future.

1. **Future-oriented governance research.** Water governance will have to change radically to manage cost-effectively and in a timely manner the impacts of new drivers like globalisation, free trade, migration problems between countries and within countries, information and communication revolution, etc. In addition, the nature of the existing drivers will also change significantly in the coming years. Among the changes of existing drivers such as population are the declining population in many Western countries, population stabilisation in many developing countries within the next four to five decades, changing age structure of the population (for example, by 2030, China will have more elderly people than the entire current population of the United States), and rapid growth of small-to medium-size cities. A very important topic to study will thus be the direct and indirect water requirements in terms of quantity and quality, and the indirect water-related impacts through sectors like energy, agriculture, environment and health, including how the current structure of water governance should change to identify and respond to these expected changes, and how such changes should be managed within the water sector.
2. **Urban water governance.** It is essential to identify 6-10 case studies of cities where significant improvements in water governance have taken place within a decade during the past 50 years. These could be analysed through reverse engineering to determine the key enabling factors that allowed them to make such progress within such a limited period. A very important issue will also be the replicability potential of these success stories in other cities of the world.
3. **Governance of the water sector as a whole.** Participants felt that difficult through it has been, governance of urban water systems, compared to overall water resources management and governance as a whole (including water for agriculture, energy, environment and other sectors) is relatively simple since the objectives of urban water management can be clearly defined without any controversy or serious debate. In contrast, overall water management and governance is a complex issue, where objectives are many, some of which may be subjective in nature and even conflict with each other. Thus, while it is relatively simple to identify good and functional governance of urban water systems, it is comparatively difficult to identify what are the best examples of comprehensive water management and governance. However, irrespective of the complexities and the difficulties, an attempt should be made to identify good cases where the management of specific systems can be considered to be some of the best, and the current governance processes can be considered as sustainable over the long-term. These cases should then be researched to determine why and how good governance has been achieved, what are the individual strengths and weaknesses, and what the potential replicability is in other parts of the world after necessary modifications to suit the local conditions.
4. **Institutional research.** What are the different types of institutional arrangements that may contribute to a functional and coordinated approach to important water-linked sectors like energy, agriculture and environment, including how policies in

the four interlinked sectors could be developed and implemented which are compatible and do not conflict with each other.

5. **Tariffs and subsidies.** There is a wide misconception on the impacts of tariffs and subsidies, both among politicians and water professionals. Therefore, research is needed on how best to structure tariffs and on what are the best types of subsidies that would simultaneously satisfy the objectives of financial sustainability of the institutions governing water, equity issues, management of demands, and water conservation.

### **Acknowledgement**

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## **Annex I. Participants to the brainstorming session**

Prof. Asit K. Biswas (Chair), Distinguished Visiting Professor, Lee Kuan Yew School for Public Policy.

Dr. Cecilia Tortajada (Rapporteur), Visiting Professor, Lee Kuan Yew School of Public Policy, Singapore.

Dr. Mahmoud Abu-Zeid, President, Arab Water Council, Cairo, Egypt.

Mr. Anand Chiplunkar, Principal Water Supply and Sanitation Specialist, Asian Development Bank, Manila, Philippines.

Mr. Soon Guan Chua, Director, Policy and Planning Department, Public Utilities Board, Singapore

Mr. Dieter Ernst, CEO, Wasser Berlin, Berlin, Germany.

Mr. Christopher Gasson, Publisher, Global Water Intelligence, Oxford, U.K.

Dr. Lai Choo Malone-Lee, Professor, National University of Singapore, Singapore.

Dr. David Molden, Deputy Director General, International Water Management Institute, Colombo, Sri Lanka.

Mr. Gérard Payen, President, Aquafed, Belgium.

Mr. Bhanoji Rao, Institute of Water Policy, Lee Kuan Yew School of Public Policy, Singapore

Mr. Raghuttama Rao, IMACS, India.

Mr. Michael Rouse, Independent consultant, Oxford, England.

Ms. Sahana Singh, Editor, Asian Water Magazine, Singapore.

Dr. Toshio Koike, Professor, University of Tokyo, Tokyo, Japan.

Prof. Alexander Zehnder, President, Alberta Water Research Institute, Edmonton, Canada.

## **Annex II. Priority issues discussed**

### **Mahmoud Abu-Zeid**

Three priority issues of water governance

- Proper Water Institutions.
- Accountability.
- Financial and organizational difficulties.

### **Anand Chiplunkar**

- Issues: water supply as a sustainable business proposition for any utility (public or private or PPP).
- Approaches: developing several models for water governance meeting the various socio-economic and political settings.
- Successes: few examples, often renegotiated (which per se is not bad as long as a flexible contractual framework is available).
- Failures: many due to poor institutional and financial structuring of projects (public or private or PPP).
- Constraints: inequitable balance in treatment of water as a economic, social and environmental good.
- Road map: capacity building of decision-makers through an advocacy of underlying principles of successful projects, visits to such projects, developing different business models for sustainability, developing projects on ground to demonstrate the turn around and getting this on the agenda of political, financial and sector decision-makers instead of only the last one.

### **Soon Guan Chua**

- The need for public sector leadership in long-term water planning - How governments can adopt a holistic approach in integrating urban development with water planning, and allocating adequate resources for water sustainability plans; how to develop deeper knowledge and greater exchange in water policies, methodologies and tools (e.g. pricing, legislation, incentives, benchmarking).
- The challenge of developing capabilities for water sustainability - How to encourage continual investment in R&D, technology, testbedding; what are the effective management models and frameworks in addressing related manpower and finance issues, and in tapping on the opportunities for the stakeholders.
- The importance of strong 3P Partnership - How to bring about more proactive involvement and partnership of the Public, Private and People sectors, working together to address water challenges and develop innovative solutions for clean and affordable water for all.

### **Dieter Ernst**

- Awareness of people on the value of water = participation of consumers  
Transparent and acceptable water policies by governments and authorities
- Proper and sustainable operations

### **Christopher Gasson**

- Tariffs, tariffs and tariffs.

Others might be:

- Utility marketing: utilities are unique in that their customers are also their largest investors, but very rarely is any effort made to sell to them (PUB is perhaps a world leader in this)
- Promoting reuse: reuse is always going to be marginal unless people accept the possibility of potable reuse

### **Lai Chao Malone-Lee**

- Top management commitment and political will
- Integration of water infrastructure implementation with urban planning
- Engagement with the local community: building water stewardship

### **David Molden**

- Implementing change – making reform happen seems very slow in spite of the need for change to adjust to numerous drivers – urbanization, environment, changing labour patterns, climate change... (where climate change may be the even not nearly as significant as other drivers)
- Administrative capacity – being able to enforce whatever rules are set
- Dealing with the informal nature of water economies – recognize that these exist and work with them. Sometimes better to leverage these through creative policy rather than try to formalize them immediately.
- Providing aligned incentives for a variety of actors. For example, why should farmers save water so that cities can consume more, unless both parties have incentives to do so.

Others:

- Dealing with issues of equity and poverty (is this a structural issue – how governance works, or is it a challenge to governance as would be adapting to climate change and other drivers of change?)
- Designing location, context specific strategies (and resisting some international big ticket items).

### **Gerard Payen**

- Governments should set up financial strategies for their national drinking water and sanitation sector that are based on an economic picture of the whole national water sector including: expenditures managed by central and local governments and expenditures financed by private sector and individuals that complement public action.

#### Rationale:

- Since many people have to spend large sums of money to overcome the lack, or the insufficiency, of the public service, their financial efforts must be taken account of in the water sector policies.

- In some areas individuals invest in 2 or 3 different alternative sources of water in order to compensate for an irregular water supply from the public networks.
  - Governments often underestimate the actual cost that is borne by their population in fetching water and they convince themselves that they cannot increase tariffs for public services, when in reality, poorly served people pay far more than the ‘official’ charges.
  - Having a big economic picture of the whole water sector seems indispensable to set up the Sector Strategic Financial Planning promoted by OECD in their recent reports. Taking account of private expenditures would complement their ‘3Ts’ approach.
- Monitor national and local policies, local programmes, international aid, action of operators by using primarily results-based indicators. In particular, this would mean that international donors report on the number of people who gain access to water / sanitation thanks to their aid. It would also mean that all public and private operators are given clear targets by relevant public authorities about the nature and quality of the service they must deliver and that they subsequently report their performance against these targets publicly.

#### Rationale:

- Many subjects and components of water management are discussed in international and national debates. However, means often seems to be given more importance than the results achieved. In practice, the priorities should be the other way round
  - Donors are used to reporting on their money spending which is not relevant to water management. It is far more important to report on, and discuss, the tangible results that should be obtained through using these expenditures.
  - Many water operators are not given clear targets. This is true in some PPP contracts. It is even more common for many thousands of public utilities that operate without any contract with their public authority.
- Central governments should organise and facilitate access of local water utilities (owned by local governments or local authorities) to predictable national subsidies and to financial markets.

#### Rationale

- Local water utilities often need subsidies from national budgets. The Sustainable Cost-Recovery approach (see OECD or Camdessus report) requires that such budget subsidies are ‘predictable’ in order to allow local utilities to anticipate and to develop investment programmes.
- In many countries, the water utility of the capital city is creditworthy and can access to financial markets to finance its investment programmes. In the same

time many local utilities are in a far worse financial situation and need support to get access to financial markets.

### **Bhanoji Rao**

- Linkages between water and development. Water is central to food security and human development. Articulation of the relationships across and within nations ought to receive relatively greater priority in research and popular discourse including media converge and school education.
- Water adequacy and related indicators. Given the centrality of water for development, to assist in water resources planning, development and monitoring, concerted research and globally accepted indicators on water are essential.
- Review of Current Practices on Water Data Collection. Indicators are worthless if data used for them are unsatisfactory. The international development community must look into the current practices of data collection and come up with solid and reasonably foolproof collection methods and strategies.

### **Raghuttama Rao**

- Clarity of Policy and Implementation Planning – There is very weak articulation of specific policy targets and outcomes with respect to Service Delivery. Even where these goals are defined, they do not often get followed up with Plans, accountability and monitoring.
- Accountability is constrained due to Multiplicity of governance / authorities and hence diffused accountability.
- There continues to be an Asset Creation mindset rather than a Service Delivery Mindset leading to: (a) weak focus on Operations and Maintenance, (b) rapid deterioration of investments and assets created leading to Investment-Deterioration-Reinvestment rather than Invest – Maintain – Delivery Services, and (c) fragmented and weakly developed water contracting industry as projects and contracts tend to be sub-scale and are monitored on the basis of compliance to a Project Report rather than on Service Delivery outcomes.

### **Michael Rouse**

- Financing water services – specifically the challenge of changing from general subsidies to full-cost recovery from charges with subsidies targeted for the poor.
- How to give responsibility for water service provision to communities to achieve ownership yet provide the necessary technical support and management capacity building.
- How to achieve economic and environmental balance between large regional water transfers and local management of water resources.

### **Sahana Singh**

- Pricing of water (responsible for the vicious circle of insufficient investment, non-revenue water, poor asset management, corruption, poor quality of manpower in utilities, poor quality of minister/govt officers assigned to the department).
- Weak regulation (and weak enforcement of environmental laws).
- Lack of awareness among voters/citizens about critical water issues (hence a proliferation of irrelevant debates such as public vs private water services, water as need or right, freshwater vs reused water). Until the voters/citizens accord high priority/value to water and sanitation, it will remain a poor cousin of the power sector.

### **Cecilia Tortajada**

- Policies and strategies for the water sector not developed in isolation, but considering their impact on other economic and social sectors and vice versa.
- Institutions: need to consider self-accountability, self-monitoring and self-evaluation.
- Development of the human resources needed.

### **Alexander Zehnder**

- Include virtual water into the national water policies, to allow countries to profit economically most from their water. This would need a market for staple food which has internationally no political strings attached.
- Sound infrastructure management, particularly in cities.
- Fair water pricing by allocating the basic water needs as a social good at an affordable price and all which goes beyond as an economic good with unsubsidized market prices.

### **Annex III. List of proposed topics for research on water governance**

- Case studies to analyse the governance of water and the needs of different sectors such as energy, agriculture or environment.
- Studies recognising that water has influence from outside the water sector, for example, the case of biofuels and water, including the impact this has had on the diets of populations affected.
- What are likely to be future drivers of water management and governance and how governance in the coming decades may change in order to account for these developments. The studies should also include how the existing drivers of water governance may change in the future and what would be the governance implications.
- Research on models for computing non-water influences, considering, for example, planning at the cities and national levels, biogas and biofuels production, efficiency in irrigation, etc.
- Research on water governance structures that have resulted into improvement of the water sector identifying their strengths
- Studies of examples of reverse engineering which are very well documented and which show successes and failures on water governance. These examples should show when water governance is working and what has actually been the process to achieve it with facts to document them. Singapore is a very specific case and some more cases are necessary where decision making is different. Some possible cities to study could be Manila, Casablanca, Puerto Rico, Abu Dhabi or Tokyo.
- Performance of different utilities including the data they use, tariffs and benchmarks for operating scenarios.
- Financial models of water utilities (both public and private) stressing their financial performance with the objective to learn but also to sensitise them on how sustainable they are.
- Research on institutional building. Including developing institutional governance models within different settings with the objective to offer alternatives to decision-makers.
- Critically examine the performance of specific water institutions, identifying the underlying principles for success and reasons for failure under given setting
- Research on water demand management strategies, how to improve them, efficiency of the systems and how to reduce unaccountable for water, even with water rationing.
- Empirical research on what is the correlation between introducing reforms in terms of water governance and electoral results. This is, to test if there are conditions under which the governments have succeeded to increase price and whether they managed to stay in power.
- Case studies of institutional governance models.
- Develop simple financial models that broadly bring out the project financial rate or return and economic rate of return of water utilities.
- There are normally clear exceptions on leadership which have resulted into specific goals and achievements. It would be interesting to identify what were the positive factors that helped them to achieve the goals.

- Public engagement is a means for good governance. Research is needed to look at who are the stakeholders or users in the water sector, what is the need for involvement of stakeholders, what is the role of the different groups, what kind of organisations can be suggested to achieve more efficient involvement, what sort of incentives are needed for stakeholders participation and what would be the performance indicators that could measure the involvement of stakeholders.
- Studies of the perception of citizens on the quality of the service they receive in different cities in Asia, proposing communication strategies that could be used to make them aware that a good water service should be a priority for them.
- Research on communication strategies among different ministries, perhaps by promoting issues of common interest such as collection and sharing of data.
- Technical research.
- Design of criteria on floods and droughts. These need to be studied because of the uncertainty related mainly to climate variability and climate change.
- Country studies on how data are calculated and check possible better methods. There have been some benchmarking studies in Asia that could be used.
- Research on non-conventional water resources and water saving technology
- Infrastructure management with a focus on eco-efficiency