

Perspectives for water management within the context of sustainable development

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One of the most challenging issues in the multi-dimensional field of water resources has been the implementation of “sustainable development”, especially using it to improve management practices and processes. This paper analyzes the complexity of the involvement of the growing number of actors in the water sector guided, unavoidably, by their individual and collective values and ideological orientations.

Keywords: water management; sustainable development; participation; stakeholders

Introduction

As actors in society and participants in public debate we face a number of issues at different levels, from the local to the global. Availability and quality of water, climate change, pervasive pollution through point and non-point sources, and loss of biodiversity are examples of water-related environmental problems that are also associated with health, poverty, equality, human rights and security. These problems are complex and interrelated.

Complexity characterizes the impacts expected from making specific decisions, for example, investing in water infrastructure of some kind. But an actor may perceive complexity along other lines as well: what kind of values and ethics or ideological orientation should enter into making a decision? There are many voices in society. Which one should one listen to in preparing an information base for making decisions? What is the role of science and experts? What kind of economics do we need?

Complexity further arises from the fact that we are part of the problem. Climate change, for example, has made us understand that we must reconsider our lifestyles, especially in “developed” countries. Another example is water resources, which are increasingly scarce and polluted but have to sustain life as well as provide, and support, multiple services within and outside the sector. The challenges are not small. Yet by challenging our own mental maps, we may find it easier to play our private, social and professional roles.

In relation to complex problems we tend to simplify and reduce our horizons. Dealing with all problems at the same time is not easy. Thus we often assume that specific issues, such as those related to water, can be dealt with separately from other issues. This is often justified but we should be careful:

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We live in a world that is becoming increasingly complex. Unfortunately our styles of thinking rarely match this complexity. We often end up persuading ourselves that everything is more simple than it actually is, dealing with complexity by presuming that it does not really exist. (Morgan 1986, p. 16)

This suggests that we should try to live with complexity and look for a level of reductionism that avoids extreme versions of simplification. We shall suggest here that some ideas are helpful for navigating in a complex world. For example, “sustainable development” has been accepted as a guiding principle by many. It is true that this catchphrase is interpreted differently by actors in different cultural contexts, but those interpretations still point in a specific direction. We shall argue in favour of one interpretation of sustainable development. It is not the only one.

Competing interpretations of sustainable development

The Brundtland Commission with its *Our Common Future* report (World Commission on Environment and Development 1987) made sustainable development a guiding principle in the international development dialogue. The report and the many documents from the Rio de Janeiro Conference in 1992 reflect the diverse views of politicians, civil society organizations, industry and other actor groups. The result is a compromise that legitimizes more than one interpretation of sustainable development. (For a review of the evolution of the concept of sustainable development, see Tortajada [2005]).

It is clear, however, that sustainable development was launched as a “new” idea about progress in society that should somehow replace or modify previous ideas. Business as usual in the sense of focus on economic growth (as measured by gross domestic product) and profit maximization at the level of companies was thereby challenged. While the authors of the Brundtland Report pointed to a need for economic growth to counteract poverty, a focus on three sets of dimensions emerged as a result of the Rio process: the economic, social and environmental. This “triple bottom line” (Zadek 2001) suggests that monetary performance alone is no longer enough.

Since “economic” and even “social” aspects of development can include almost everything, we believe that it is more useful to make a distinction between “monetary” and “non-monetary” aspects of development. The non-monetary aspects include various social and environmental impacts that encompass health and culture, for example. The “newness” of the Rio Conference and preparations for it can thus be interpreted as pointing in the direction of *making non-monetary aspects of development more visible*. It is no longer enough to point to monetary indicators in a situation where a number of global and regional unsustainable trends have been observed concerning water resources, climate change, pollution, biodiversity loss, illnesses, poverty and so on. The more recent UN Millennium Development Goals point in this direction of making non-monetary trends visible (United Nations 2007). Negative trends should be reversed when possible. The qualification “when possible” recognizes that non-monetary processes, unlike monetary ones, are characterized by inertia and, sometimes, irreversibility.

In addition to making non-monetary impacts legitimate as such (and not only through some alleged monetary value), the Rio Conference pointed to the need to *articulate intra-generational as well as inter-generational ethical issues* as part of the development dialogue. Ethical horizons in relation to other people and in time should be extended rather than reduced. Sustainability also involves a consideration of security issues and generally

attempts to prevent negative series of events. In the interest of the present and future generations, the “precautionary principle” (for example, Harremoës *et al.* [2002]) should be observed in situations of uncertainty as part of such ethical deliberations.

Present development patterns in different parts of the world are, however, not so easily changed. Considerable inertia and path-dependence are involved and some current development trends tend to make the task of approaching sustainability even more difficult. Here the World Commission on Environment and Development and the Rio de Janeiro Conference pointed to the necessity of ideological reorientation towards sustainable development and through its Agenda 21 document *to dialogue involving many stakeholders at different levels* from the local, through the national and regional levels to the international level.

Having excluded business as usual as not being compatible with the intentions behind the Rio Conference, at least two options remain. One is to modify present thinking habits, ideologies and institutional arrangements in an attempt to cope with the problems faced, leaving the existing institutional arrangements essentially intact. This is the “Ecological Modernization” policy path (Hajer 1995) followed to some extent in some parts of the world. This policy includes instruments such as environmental management systems (EMS) and other certification schemes of a voluntary kind, reference to specific codes of conduct indicating the meaning of corporate social responsibility (CSR), methods such as life cycle analysis (LCA), environmental impact assessment (EIA), environmental labelling of products, new partnerships between industry and government or between industry and environmental organizations, environmental taxes to reduce extraction of natural resources or levels of pollution, markets for pollution permits and poverty reduction programmes.

One advantage of these instruments is that growing awareness of environmental, poverty and human rights issues in many circles may facilitate further social and institutional changes towards sustainability. Some of the above measures and policy instruments, such as environmental taxes, if implemented on a large scale, can be very powerful in transforming society. But their full potential will not be attained as long as they are constrained within the scope of present institutional arrangements. More radical interpretations of sustainable development and in this case, management, policy, governance and development of water resources, have to be brought into the picture.

As part of economic and policy deliberations at the governmental level, the tendency has been to identify environmental problems at the ecosystem level (water resources depletion and pollution, climate change, ozone layer degradation, pollution, biodiversity loss and so on) and to connect them with “failures” of the political economic system (“market failure” and “government failure”). Proposals concerning policy instruments are more or less directly derived from such observations and then related to neoclassical economic theory.

Problems can be formulated at more fundamental levels, however. If things go wrong, it becomes very relevant to focus on dominant ideas about science and how it relates to society and politics, dominant paradigms in economics, dominant political ideology and dominant institutional arrangements (Söderbaum 2004). This means that all kinds of actors in society should be challenged. Here, there are many other kinds of “failures” than the ones suggested by neoclassical economists:

- failure of dominant scientific paradigms;
- failure of dominant ideas in specific disciplines, such as economics and business management;
- failure of dominant political ideology; and

- failures of existing institutional arrangements.

Such possibilities should be open for debate and systematically investigated. This in turn brings us to the role of science and universities in relation to present challenges. Universities are supposed to be places of new, creative and critical thinking but – as is the case everywhere where people meet – there are social limits to public debate with considerable room for defence of vested interests, opportunism and blockage of new thinking. But there are some open doors as well, and strengthening democracy is a way of overcoming some of the difficulties.

Government, governance and democracy in relation to sustainable development

Many of us live in societies that claim to be governed according to the principles of democracy. The term “government” is connected with a system where politicians elected by the people formulate policies for various sectors that are then implemented by administrators through specific systems of rules. This is essentially a one-way channel of formulating and implementing political will. Individuals and organizations are expected to comply with the rules, which constrain their own objectives: in a neoclassical economy, these are maximizing utility (for consumers) or profits (for firms).

National and local governments will continue to have a central role, but the one-way idea of governing and politics represents a simplification that is now challenged. In addition to “government”, reference is made to “governance” suggesting a broader concept. Much like “sustainable development”, the meaning of governance is still a bit vague and open to different interpretations (Pierre and Peters 2000, Hajer and Wagenaar 2003, Tortajada 2010a, 2010b). But there is some common understanding in that experts in centralized positions cannot deal with the issues alone. The development path – with all kinds of impacts upon people and nature – that a given region or country will take depends on the activities of multiple actors and on their interactions.

As understood here, “governance” points in the direction of understanding policy making as well as social and institutional change processes by considering, *inter alia*:

- multiple categories of actors and heterogeneity within each identified actor category;
- multiple relationships and networks between actors;
- multiple institutional arrangements with connected rule systems;
- multiple levels in administrative or territorial terms from the local to the global;
- multiple scientific, ideological and other perspectives.

Politics at the national level and the rule systems administered by state agencies still play a specific role, but the essence of governance is that individuals and organizations may also engage as actors in politics and policy making. Governance assumes companies not only adapt passively to rule systems controlled and institutionalized through national governments but may on their own, or in co-operation with other business and non-business actors, formulate their political agenda and create their own rule systems and institutions. Environmental management systems (EMS) and corporate social responsibility (CSR) with connected “codes of conduct” exemplify such voluntary rule systems. Networks of business actors may support or counteract specific governmental initiatives with sustainable development as their purpose, for example. Actors such as non-governmental organizations and media may similarly have a political agenda and through public debate and in other ways influence various development patterns.

Interaction between different administrative levels is another of the mentioned features of governance. Local management of water systems is also related to regional, national and perhaps international systems (Tortajada 2008, Varis 2008).

The terms *paradigm* and *ideology* may need further clarification. “Paradigm” stands for “theoretical perspective” with connected conceptual framework. Neoclassical theory is one paradigm in economics that is specific not only in conceptual but also ideological terms as will be explained below. “Ideology” is here used in a broad sense as “ideas about means and ends” or “means-ends philosophy”. Not only established political ideologies, such as liberalism and socialism, qualify as ideologies but also “issue-related ideologies”, for example those related to health policy or environmental policy. We may even speak of “means-ends philosophies” and thus ideologies in relation to water. Some emphasize water quality, others quantity of water; some accept maximum exploitation of water resources for electricity purposes, others insist on the need to protect ecosystems and their services. An ideology may be perceived by an actor as extreme or radical but there are also “compromise ideologies”. In fact each actor, as we will see, is assumed to be guided by some “ideological orientation” (in the case of individuals) and “mission statement” (in the case of organizations).

According to the present use, however, “ideology” or “ideological orientation” is a necessary fact of life (cf. also Brown [2000]). We all refer to means-ends philosophies in our daily life and while participating in public debate.

Related to the unavoidability of values and ideology in social science research and policy analysis is an increased interest in the subjectivity of individuals as actors or stakeholders. Traditional ideas about objectivity and general laws are of course still relevant in many situations. But even when measuring such things as water quality, subjectivity and ideology enters into the picture. There are many possible indicators or parameters to consider in a monitoring system that may be of relevance to some actors and the subset of indicators chosen is to some extent a subjective (or ideological) matter. Only if somebody else dictates what to measure can one in some limited sense claim objectivity.

How does an actor understand her or his role as professional? What are the limits and opportunities connected with this role? How does the actor understand the concept of sustainable development? How does this understanding affect practical behaviour? How does the actor relate to the UN Millennium Goals, and so on?

When asking questions of this kind, the idea is not primarily to criticize administrators or politicians for what they are doing or not doing but rather to enter into a process of interactive learning and self-reflection for all actors involved, the scholars included. Nor do we as scholars pretend to know the final answer to the questions raised. The issues are complex and multifaceted – and this is so even for the so-called expert. Contextualism furthermore points to the existence of cultural diversity and the necessity to adapt to local cultural circumstances rather than suggesting that there are “solutions” that are applicable everywhere.

Thomas Kuhn (1970) once introduced the concept of *paradigm shift*, which still has a considerable influence upon how “ordinary people” and scholars themselves understand progress in science. When the weaknesses of one existing paradigm (theoretical perspective) become obvious and some new paradigm appears to be able to deal with those weaknesses, a “paradigm shift” will occur wherein one paradigm replaces the other. Kuhn himself noted exceptions where the same phenomenon, for instance “light”, can be approached from two different angles and where each theoretical perspective adds to the understanding offered by the other. But when we enter into the social and political sciences where values, ideology and politics are essential, then “paradigm coexistence” should be

regarded not as a special case but as the norm (Söderbaum 2000, pp. 29–30). In the social sciences, while recognizing paradigm coexistence, it is possible to point to a shift in the dominant paradigm. Like many, the present authors see many weaknesses in the dominant paradigm of neoclassical economics.

It may then be concluded that actors in universities, much like other actors, have to live with multiple perspectives that are sometimes competitive, sometimes complementary. Fundamentalism in terms of social science paradigm is not compatible with democracy and good governance.

Sustainable development as ideology

Sustainable development as previously described was proposed as a guiding principle for local, national and regional communities and ultimately for the global community. Although open to more interpretations than one, sustainable development certainly qualifies as ideology. It points to the importance of non-monetary factors and impacts in policy analysis and to the necessity of considering our moral obligations to future generations as well as to the present one. Considering the limits to our knowledge and the complexity of the issues faced, sustainable development also involves advocacy of the “precautionary principle”. It further recommends strengthening democracy as a way of dealing with complexity and of fostering a sense of community and interdependence. We all depend upon each other and upon ecosystems and nature. If sustainable development is not taken seriously in some parts of the world, regarding CO₂ emissions for instance, then we may all suffer.

In relation to water issues, sustainable development as ideology then points in the direction of extending our horizons in policy and analysis (Söderbaum 2005):

- from a focus on water to also include “non-water” issues;
- from a focus on the home region to also include other regions;
- from a focus on tangible economic issues to also include non-tangible issues; and
- from a focus on the present generation to also include future generations.

This “extension of horizons” is of course not an easy thing to do, especially in societies where self-interest is entrenched. But it is increasingly understood that we live in a global world and extending our horizons is therefore not completely unrealistic. Individuals living in different parts of the world have common interests in many respects. Controlling emissions that may contribute to global warming, ozone layer depletion, floods and droughts or loss of biological diversity are examples that point to the necessity of co-operative action in different forms. Regionally and locally there are many common interests in terms of clean water, clean air, clean streets, a positive social climate and security. All those who share such interests are *stakeholders* in the sense that something that they care about is at stake for themselves and for their children and grandchildren.

Common interests are sometimes strong and may take the form of *common property*. Individuals living in a specific village may long since have understood that they share interests in protecting and managing the use of a specific natural resource. This means that a limited number of individuals in some sense the common “owners” of a water system, forest or lake while excluding other individuals and organizations. The individuals have to share (more or less) an ideology about how to manage water resources, for example, what to do when some individuals do not respect the established rules. In the case of indigenous people, there are many positive examples of well-functioning, sustainable “commons” but

it is of course also possible to think of examples where a limited number of individuals exploit natural resources in an unsustainable way. An extensive literature exists in the field of “common property resources” (Ostrom 1990, Kaul *et al.* 1999, Bollier 2003, Marshall 2005).

Towards institutions for sustainability

Social and institutional changes are going on all the time in all parts of the world. Some of these processes will get us closer to, others further away from, sustainable development. Unfortunately, there is no “invisible hand” that we can rely upon to counteract unsustainable trends and to strengthen the sustainable ones. Instead we have to turn to individuals as actors in different roles and their ways of interpreting the world.

It is suggested here that institutional change processes start with individuals modifying or changing their *interpretation* and understanding of specific phenomena. The new interpretation is “named” by someone at some stage and thereby integrated into the language of the actor. The new interpretation and language may be shared with other actors and manifested not only in terms of name and language but also in a changed understanding of roles and in practice, for example, changes of behaviour, organizational changes, and so on. In this way a new *institution* gradually emerges. It may outcompete other institutions or exist together with them. Relations to other institutions may then be supportive or antagonistic.

To summarize this abstract part, there are five aspects of change processes related to institutions:

- *interpretation* connected with broader conceptual frameworks or languages;
- *naming*, that is, incorporation into language;
- *emotional*, valuational or ideological relationship to the phenomenon;
- *manifestation* in various forms; and
- *sharing* of interpretation and its manifestation (name, behaviour change, and so on) with other actors to increase its *legitimacy* and *acceptance*.

The examples given point to the importance of paradigms (and other schemes of interpretation) and of ideology in influencing institutional change processes.

Sustainability of water resources, important drivers and actors’ interventions

Water management in much of the world is at a critical juncture. Even when it plays an essential role in promoting development and reducing poverty at the national and sub-national levels, it is often mismanaged, poorly governed, scarce and polluted. Considering that water is likely to be one of the most critical resource issues of the coming decades both in terms of quantity and quality, as well as due to the fundamental importance it holds for sectors such as energy, agriculture and environment to mention only some of them, paradigms for its management, policy making, governance and development will have to be reassessed and modified within the framework of sustainable development – within an overall societal and development context.

In the field of development paradigms, it has long been recognized that there are clear gaps between their current understanding and the one that is necessary to address evolving economic, social and environmental policy, planning and management issues as well as

their institutional, legal, regulatory, financial and social considerations. Sustainable development as a paradigm has permeated development discourse for more than 20 years as an umbrella concept without necessarily having a visible impact on natural resources management practices *per se*, water included. This has not been necessarily because of the concept itself, but mostly because of its lack of implementation due to the complexity involved, which includes influencing effectively the multiplicity of actors and institutions that are invariably associated with water.

Both developed and developing countries face the complex and interrelated forces of a very rapidly changing world, one more reason why many of the existing paradigms (including sustainable development) are confronted with very difficult practical realities that make their implementation exceedingly difficult under the best of the circumstances. Consequently, inappropriate and inefficient management practices often continue to prevail, and a futuristic vision for a much-needed broader perspective on key issues related to development still has to be formulated and implemented in most countries, even progressively. The net result has been that good and implementable policies are still needed in all sectors of resources management (including water, energy and agriculture) for economic, social and equitable development.

There are multiple key global drivers for change that affect water resources and their sustainable management through many different pathways. These include, but are not limited to: economic growth, population structure and distribution, urbanization, food production, energy, environment, technological advances and globalization.

The projected expansion of the global economy and the failure to address environmental concerns (including those related to water) will have even more impact in the future than they have today. Without efficiency gains and explicit implementation of demand management policies, all natural resource sectors will find their demands increasing steadily. A clear example are the impacts of large economies like the BRIC countries (Brazil, Russia, India and China) which have become major economic and trade partners and competitors, but also resource users and polluters on a scale that is comparable to, and in some cases even higher, than some of the largest developed countries. Their pace of cumulative economic growth has been approximately 30% since 2000, with visible related economic, social and environmental impacts in the entire world. Even when their growth is expected to slow down over the next several years, it will still have major water-related implications, both in terms of quantity and quality, not only for them, but also for many other countries in an increasingly interrelated world. Sectors such as water, agriculture, energy, fisheries, forests and minerals will need to have strong policies in place to reduce the environmental impacts of this rapid growth. Projected per capita annual income growth at the global level between 2001 and 2030 is estimated to be 2.37% and about 4% for the BRICs. Without regular efficiency gains and changes in national policies and societal perceptions, the steady increase in per capita disposable income would tend to be closely associated with an increase in the consumption of products and services, and consequently more water use and pollution, increasing energy consumption and the generation of waste. Rapidly rising income growth, notably in China and India, is also of main concern because it is responsible for up to half of the recent increases in the food prices. As middle classes grow more affluent, food consumption patterns change too often towards diets richer in meat and dairy products that are much more intensive in terms of both grains and water use.

In terms of population growth and thus patterns of consumption, almost all the increase in the future world population is expected to be in developing countries (from 76% in 2008 to 80% in 2050). Half of the world population growth may occur in only six countries: India, China, Pakistan, Nigeria, Bangladesh and Indonesia. These anticipated very

high growth projections potentially pose major challenges to the environment by placing pressure on resource utilization. In the case of water resources, both the economic and population growth rates have major implications for access, quantity, quality, equity, management and investment requirements, making them more challenging because policy measures still do not address these issues adequately or systematically (OECD 2008). Equally, the institutions through which such policy dialogues should be initiated with interested and affected actors, and which are also responsible for their formulation and implementation, are still not in place or not equipped in many cases to deal with these difficult and complex tasks.

As the needs of the world continue to increase significantly, the water requirements of the energy sector are likely to increase as well. All large-scale generation of electricity invariable requires water, a fact that has mostly escaped the attention of water and energy planners. This is not a minor issue since, for example, the role of biofuels as a source of demand for grain has also been a significant element of recent food-price rises.

Since energy prices are significantly higher than food prices, the promotion of biofuels has led to many unexpected results. For example, in the United States, ethanol accounted for only 8% of transportation fuel output but consumed nearly 40% of its maize crop. According to the Food and Agriculture Organization (FAO *et al.* 2011), global ethanol production increased four-fold and biodiesel rose 10-fold between 2000 and 2009. At present, biofuels account for 20% of the world's sugar cane production, 9% of oilseeds and coarse grains and 4% of sugar beet. The report estimates that, if the current trend continues, the price of coarse grains could increase on an average by as much as 13% per year between 2013 and 2017; oilseed prices by 7%; and vegetable oils by 35%. The World Bank has estimated that rises in food prices alone pushed an extra 44 million poor people into hunger in the second half of 2010. If food prices escalate further, the world hunger situation will be exacerbated. If all current national biofuel targets are to be met, it is estimated that nearly 10% of the global cereal production would have to be used. Alternatively, if food crop availability is to be maintained, very large amounts of extra land would have to be cultivated, which would require enormous amounts of additional water. Another very serious impact would be on water quality because of the additional use of agricultural chemicals which would leach into water bodies. Since such enormous quantities of land and water are not available present policies are likely to lead to a diversion of food crops for biofuel production. This would increase food prices by 15–40%, which would have dire consequences for the world's poor. And even if all American corn used for ethanol production were to be used for food, it is estimated that global edible maize supply would increase by a mere 14% (Biswas 2011). Present promotion of biofuels clearly needs to be reconsidered.

Additionally, within the water sector, there are some fundamental supply-side factors which might collectively be termed “scarcity issues” that also have an impact in other economic sectors. These are already starting to make themselves felt in several countries and are likely to become more significant for both social and economic stability. Some examples follow.

Water availability

If the current trends continue, water availability is likely to become a more pressing issue due to the increasing demands from competing uses and users. A matter of management and governance rather than physical scarcity, it is on this issue that a host of accomplishments have been achieved especially in terms of access to water in urban areas, with quality issues related to access still not always receiving adequate attention.

Water quality

Contamination due to point sources has been stemmed in most developed countries while non-point pollution still continues to be a major problem in both the developed and developing world. Main problems include increasing eutrophication due to over-enrichment of coastal waters from nutrient run-off with both environmental and economic consequences (Diaz and Roserberg 2011). One of many examples refer to the Gulf of Mexico where leaching of agricultural nutrients, carried subsequently by rivers like the Mississippi, have created a hypoxic (oxygen-depleted) zone which, in 2006, was approximately 17,300 km². Emerging contaminants such as endocrine disruptors in water bodies have also become a serious concern at the global level (Burkhardt-Holm 2010).

Water infrastructure

Water infrastructure in all the developed countries is ageing fast, and needs extensive and expensive rehabilitation. The US Environmental Protection Agency has estimated that the United States will need an additional US\$23 billion per annum for the next 20 years to keep the water and wastewater infrastructure functional and in compliance with the regulations: a situation which is very similar in all developed countries. This is an important funding gap on which not only more public debate is needed, but also research in terms of finding better economic, technical and management solutions. Nearly all developing countries lack adequate water infrastructure, as well as proper operation and maintenance of existing structures.

To the above is added a multiplicity of other issues on which it is still necessary to develop forward-looking strategies: policies and politics; institutions; capacity-development programmes; financing and investments strategies; research and development (R&D); science and technology development; and, most important, actors, paradigms and ideologies, to cover demands to all sectors of society.

Water as a multi-dimensional resource with multi-actor involvement

Water is, and has always been, a multi-dimensional resource and a cross-sectoral concern. Therefore, its management, policy making, development and governance depends increasingly on policies in other sectors. Since water quantity and quality aspects are multi-sectoral, multi-dimensional and multi-disciplinary, so too are their associated trends, drivers and challenges and they should be approached as such.

The water sector does not have a direct influence on development policies. Nonetheless, in the fight against poverty, in the collective efforts to meet the Millennium Development Goals and in the effort to improve the lives of people and relevant institutions, water-actors should work on innovative and broader strategies that enable economic growth models to incorporate factors such as impacts on the environment and on natural resources (water included), redistributive capacity, inter-sectoral and international linkages, via trade, investment and migration. Innovation depends on more than investment in R&D or on supporting science and technology. It also depends on a plurality of factors and on the ability to bring them together in a comprehensive framework including: sound policies and wide-ranging skills; formulating public policies and implementing them; sharing knowledge and experiences to improve development perspectives; and promoting partnerships for development. Conventional wisdom needs to be challenged, including our own, if we want to progress innovatively in the way we address current and future development recognizing water as a fundamental component of it (OECD 2011).

While this changing global development landscape, and the drivers of change which affect and will continue affecting the water availability and use patterns still have to be studied in depth, their increasing social and environmental pressures are being felt already by developing countries. These countries are less equipped than developed ones to manage and adapt to the rapid changes the world is facing in financial, institutional and policy terms. Even for developed countries, these changes have largely outpaced the benefits of any efficiency gains that have been witnessed in recent years, which demands an even more serious commitment of actors and institutions.

Interestingly, the importance of water and its nexuses and impacts on other economic sectors such as energy and agriculture, is being realized only at present. This is being reflected in the preparatory process towards the Rio + 20 Conference, with its theme of green development in the context of sustainable development and poverty eradication, and the institutional framework for sustainable development (UNGA 2010, United Nations 2011). This is an event we actors shall witness with too many fundamental issues unresolved.

To face global changes, new and innovative policy actions are very much necessary for more efficient management of natural resources, including water, in both the developed and developing world. Change is the only stable feature in both the present and future. The only alternative to face constant change is the achievement of overall sustainability not only in terms of policy making and implementation, but also in terms of understanding social and political dynamics, aspirations, beliefs, values and their impacts, issues which have a main role to play.

The uncertain and unexpected developments of our changing environment require that different actors communicate with each other and look towards the future when working on problems, alternatives and solutions related to water management, policies and governance practices. Equally, improved communication between a multiplicity of groups with different interests and agendas, dissimilar ethics, values and norms, and absence of an overall consensus about the types of goals that are to be pursued will require the development of extraordinary measures of co-ordination, collaboration and co-operation (Biswas and Tortajada 2009). In fact, the global water community could engage more actively on issues related to knowledge generation and synthesis from different parts of the world, not only from within the water sector, but also from outside the sector, since these will have a bearing on water management in the future and vice versa. This could include consideration of appropriate policy options to solve key water-related problems due to their increasingly complex and often cross-sectoral nature, but always within the framework of economic and social development of the countries concerned.

Societies have always had to adapt to changes in their economic, social and natural environments. What is unprecedented is the speed and extent of change that the social systems are finding difficult to cope with. Factors exacerbating the problems include increasing population growth, density and ageing of the population all over the world as well as the rapid deterioration of the environment with connected societal values. The world and the human adventure appear richer in potential, more complex and more interdependent, but also more uncertain than ever. Countries have been looking for development, rather than sustainable development. There has been the erroneous idea that environmental protection represents a constraint to development. Perhaps Singapore (Tortajada 2006a, Luan 2010) is a rare exception to the race for unsustainable development.

Finally, regarding development goals, it is important to bear in mind that economic, social and environmental policies and programmes (including those related to water) should be consistent for at least two reasons. First, because poverty is both a cause and

an effect of environmental degradation, since societies living in poverty do not have the means or incentives to make the environment an important consideration. Second, because even with robust economic growth, increased income and improved environmental quality are not always related, since more affluent countries and better-off citizens may not necessarily be concerned about protecting the environment. One way or another, there are no universal blueprints for a transition to a sustainable society, so new and innovative implementable policies are needed to reduce environmental degradation and persistent poverty all over the world. The current global financial crisis is a giant step backwards. It originated in the financial systems of developed countries yet has impacted very severely most middle and low-income countries, threatening years of progress in poverty alleviation, and as such, making the goal of sustainable development much more difficult to achieve.

Challenging established paradigms is recognized as the best way to encourage society and institutions in the direction of more responsible behaviour, in this case towards a more sustainable management, policy, development and governance of resources, water included. While identification of environmentally effective and economically efficient solutions is necessary to ensure successful implementation of innovative policies, some other issues are also fundamental to get onto the sustainability track. They include societal ideologies and ethics in relation to environmental management and inter-sectoral, inter-disciplinary, multi-dimensional and intergenerational communication, exchange of information and generation of knowledge, and the promotion of innovative ideas. Given the increasing constraints of the water sector, the above seem to be feasible tools to be used in our future pathway to development, or better said, our pathway to sustainable development.

Complexity of multi-actors' involvement

Processes that involve dialogue, interaction and debate between actors are enormously intricate. It is particularly difficult to persuade the different actors to recognize and assume their responsibility for the protection and conservation of the resources they use.

The most common means by which stakeholders can have a say in decision making is through the interest groups to which they belong. However, when only such groups (many of them non-governmental organizations) are involved, the views that are put forward may not always be sufficiently representative. Groups of stakeholders neither include all of the citizenry nor represent all of its needs and concerns. In addition, stakeholders who are affected by a particular decision or problem are not necessarily all represented in the groups that are prepared to take part in decision making. Members of local institutions, groups of users, or normally excluded sections of the population often remain unheard.

Even when participation can be useful in understanding the reasons that lie behind a particular decision, it provides no final assurance that any agreement can be reached among the parties involved. It is commonly assumed, for example, that participation helps to build consensus and prevent conflict, and that dialogue provides an opportunity for stakeholders to discuss and have a better understanding of the different viewpoints. However, although participation processes represent an opportunity for stakeholders to share objectives, experiences, responsibilities and be more agreeable to the solutions that will be reached, this is clearly not always the case. In many cases the dominant interests and ideologies make no allowance for interaction and exchange of ideas, blocking any work towards a common objective.

Participation is not, therefore, some lofty ideal: stakeholders and members of the society interested in an issue may engage for specific motives that, far from implying the quest for a common goal, represent an effort to impose specific interests. Thus, the challenge is

not that people and organizations, both formal and informal, participate. The challenge is that they do so while being fully aware of the facts and the accompanying sense of responsibility that commits them to make constructive contributions to the common cause, and stand by group decisions even when the results fail to coincide with their specific interests. Participation must not be understood as an end in itself with the organization of participative processes as the final objective. It has to be a means of achieving joint responsibility for the decision making in the different economic and social sectors where they form part of the problems as well as the solutions. The role of governments is to promote processes and establish spaces for communication, information and participation where proposals are discussed, decisions are taken, and mechanisms are established that link government actors and other stakeholders (Tortajada 2006b).

It is important to note that the term “participation” does not necessarily have the same meaning for public administrations as it does for the public whose interests are involved or affected. From the point of view of public administrations, participation is still frequently associated with the ability of citizens or their organizations to have access to information and to participate as and when required by the administration. From the citizens’ viewpoint, on the other hand, participation is often understood as a process of continuous intervention in decision making at all levels. Citizens and their informal organizations expect their government to establish instruments of participation for the social identification of problems, the setting of priorities, definition of objectives and the management of solutions and follow-up measures; in sum, instruments that allow for participation throughout the whole decision-making process. Even so, joint participation in decision making is not always accepted by all stakeholders as part of a general process of joint responsibility: while citizens and their organizations seek the legitimate right to take part in decision making (in this case on water-related issues) they are not always willing to assume joint responsibility for the resulting action.

Most of the instruments to promote stakeholder participation that have been developed are based on the representation of joint interests through the presence and participation of non-governmental organizations. In most countries, the ordinary citizen as such almost never takes part in decision making; his or her needs, concerns and points of view are expressed, not directly, but through non-governmental organizations. These organizations pursue causes in a way with which the ordinary citizen may or may not be in agreement, and with which he or she may or may not feel that they identify. Thus, it is a mistake to believe that “*the public*” (our italics) has a homogeneous point of view when there are normally many different views on any proposal and it is important to listen to as many of them as possible. It also has to be understood that no sole organization represents “*public opinion*” (our italics), since the groups that are most interested in taking part in decision making (including the non-governmental organizations) can hardly claim to represent the views of all of the public. As a way round this limitation, as many citizens as possible should become involved: stakeholders’ organizations cannot be regarded as a substitute.

Seeking improved patterns of governance within an environment of different interests, dissimilar values and norms, and more than occasionally the absence of consensus about goals, represent formidable challenges that require extraordinary measures of coordination and co-operation not only from the government but also from stakeholders and societies in general. Therefore, the way forward is for the countries and the regions to realize the importance of planning and implementing frameworks for good water governance within their own social, economic, environmental and cultural conditions, including processes and mechanisms of interaction between state and non-state actors and looking for clear communication around mutual responsibilities.

Concluding remarks

The awareness of unsustainable trends locally, regionally and globally is increasing in many parts of the world. Much has been achieved to counteract negative trends with respect to health, ecosystems and natural resources, for instance by improving the availability and quality of water. But a lot remains to be done.

In the attempts to avoid further degradation of natural resources and strengthen positive trends, it is certainly possible to refer to experience and learn from “good practice” at other places. But in many situations, the complexity is such that it becomes questionable to rely on the ready-made solutions or the “technical fixes” of experts. It has here been suggested that a serious dialogue is called for over fundamental issues concerning the “structure” of mental maps of different actors, experts and politicians included. Many actors with different perspectives could contribute to a multi-faceted process of governance.

As scholars, we cannot tell others about the “correct” ideological orientation. We can, however, argue against monism in theory of science, with respect to paradigms in economics and business management as well as concerning ideology. Monism is a threat also in so-called developed countries and not limited to communism or specific religious groups. Only pluralism in the sense of co-existence of theories of science, paradigms in economics and ideologies is compatible with democracy, as we have explained.

While “sustainable development” can be interpreted in more ways than one, United Nations declarations nevertheless offer important guidance. One reason to be a bit optimistic is that common interests often exist between actors, locally, regionally and globally as suggested by the title of the Brundtland Report: *Our Common Future*. There are many reasons to co-operate and as part of this co-operative learning process cultural diversity may prove to be an important asset.

Individuals as citizens, voters, participants in public debate and professionals are similarly understood as potential or actual policy makers. As already mentioned we can modify our lifestyles and change our social and environmental – and water – performance in the interest of sustainable development. Alternatively we can protect an environmentally wasteful lifestyle and support a business-as-usual strategy. This brings us to another characteristic of governance, that is, acceptance of the existence of multiple perspectives. Individuals and organizations as actors refer to different ideological orientations in their attempt to fulfil their own aspirations and influence development patterns at the societal level (Söderbaum 2008).

Changing thinking from *governing* to *governance* meant to move from a relatively simple model of society to one that is more complex and hopefully more useful. Recognizing the existence of many actors who differ with respect to interests, perspectives and paradigms and where power may be highly concentrated, suggests that we need to make a distinction between “good governance” and governance that can still be considerably improved. “Good governance” is then compatible with normal rules of democracy where actors of different categories may contribute in an interactive learning process. Actors connected with national governments can play a leading role by improving opportunities for participation of stakeholders and other actors, increasing transparency of the decision process as well as accountability of various actors, in this case for the sake of the environment and the natural resources and, in consequence, their own quality of life. But again, other actors than those with a central position in state administration can contribute. Journalists and university scholars, for instance, have roles that can be played in ways that may bring us either further away from or closer to sustainability. Thinking in terms of “governance” rather than “government” then becomes a way of reminding us that all kinds of actors

(rather than only elected politicians) are to some extent responsible for our success or failure in approaching a sustainable society.

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