Executive summary

The need to reform water policies is as urgent as ever. Yet governments around the world face significant challenges in managing their water resources effectively. The problems are multiple and complex: billions of people are still without access to safe water and adequate sanitation; competition for water is increasing among the different uses and users; and major investment is required to maintain and improve water infrastructure in OECD and non-OECD countries. Population growth, urbanisation, and changing lifestyles as a result of economic growth are key drivers of these challenges, while increasing spatial and temporal water variability resulting from climate change will exacerbate these pressures. Despite progress on many fronts, including on reaching the Millennium Development Goals on water and sanitation, in 2008 an estimated 141 million city dwellers and 743 million rural dwellers remained without access to an improved water source, and an estimated 2.6 billion people without access to sanitation.

Making reform happen in the water sector requires governments to ensure the incentives are aligned for all stakeholders. Governments must put in place the conditions to ensure that the actions of all stakeholders – different categories of users, multiple responsible authorities, financiers, and various service providers – contribute to the long-term objectives of environmental sustainability and enhancing social welfare. It also often means generating sufficient information and support for policy change by making the case for reform – answering the question of "what is in it for society and individuals?"

Reform in the water sector can take a range of forms, from wholesale and fundamental changes to the way that water policies are designed and implemented (such as in Australia, which has undertaken a long period of water policy reform, and in Mexico, which recently initiated a Water Reform Agenda) to relatively marginal adjustments to refine existing policy settings and instruments in order to improve their effectiveness. While there is no "one-size-fits-all" recipe for water policy reform, understanding the political economy of reform means taking into account how decisions are made and in whose interest; how reform is promoted or obstructed and why. Learning from the experience of past and on-going water reforms can help to illuminate wider lessons that can increase the prospect of success for future water reforms.

This report proposes a three-pronged approach to making water reform happen in terms of financing, governance, and coherence between water and other sectoral policies. These broad areas represent the fundamental axes for ensuring that water policy frameworks are sustainable and durable, yet flexible enough to respond to changing conditions.

Framing the challenges

The *OECD Environmental Outlook to 2050* projects the trends and highlights the dangers faced if the business-as-usual approach to environmental resources continues. Increasingly rapid urbanisation coupled with population growth and changing economic dynamics means that the future will be characterised by increasing pressure on water resources, potentially acute competition for water, declining water quality, and a continuing need to further improve access to safe drinking water and sanitation.

Freshwater availability will be further strained in many regions, with 1 billion more people than today (nearly half the world's population) projected to be living in river basins experiencing severe water stress, especially in South America, North and South Africa, and South and Central Asia. Overall, water demand is projected to grow by some 55% due to growing demand from manufacturing (+400%), thermal electricity generation (+140%) and domestic use (+130%). In the face of these competing demands, there will be little scope for increasing water for irrigation and, under the baseline scenario, there is expected to be some reduction in water for irrigation as a result of no increase in irrigated land and improvements in water use and efficiency. If these do not eventuate, competition for water will be even more acute.

The combined effects of these pressures could imply water shortages that would hinder the growth of many economic activities. Groundwater depletion may become the greatest threat to agriculture and urban water supplies in several regions in the coming decades. Nutrient pollution from point sources (urban wastewater) and "diffuse sources" (mainly from agriculture) is projected to worsen in most regions, intensifying eutrophication and damaging aquatic biodiversity.

Notwithstanding this, most regions, except Sub-Saharan Africa, are likely to meet the Millennium Development Goal (MDG) of halving by 2015 the 1990 level of the population without "improved" water supply. However, this will still leave behind over 200 million people without access to water by 2050. **Of critical importance is the fact that access to an "improved" water source does not necessarily mean access to "safe" water fit for human consumption.** Over the last two decades, the number of city dwellers without access to water services has increased, as urbanisation outpaced efforts to connect people to water infrastructure. It is expected that the MDG for sanitation will not be met by 2015, and by 2050, 1.4 billion people are still projected to be without access to sanitation, mostly in developing countries.

The *Environmental Outlook to 2050* underscores the need for more ambitious policies and new ways of looking at the water challenges. **Water needs to be seen as an essential driver of green growth**. Investments in infrastructure and operation of water-related services can provide high returns for both the economy and the environment. It is also crucial to develop mechanisms for allocating enough water across uses and users, including for healthy ecosystems, and to develop alternative sources of water (rain and storm water, used water and desalinated sea or brackish water). The inverse is also the case, where economic and social development can be retarded by lack of water infrastructure and inadequate service provision.

There is also a crucial need to develop water information systems to support more efficient and effective delivery of sustainable water resource management and policies. In particular, the rapid development in water policy reforms has created an information imbalance in many countries, with implementation of water policy initiatives often supported by little data and information.

The *Environmental Outlook* highlights the urgent need to get the basics of financing, governance and policy coherence right in water policy. These factors are essential for reforms to succeed, as well as representing key areas of reform in their own right. They are inextricably linked and addressing them is the key to give water a higher priority in government policy and unlocking the potential of the water sector to meet the aspirations of governments and societies in developed and developing countries.

Meeting the water financing challenge

Securing sustainable finance for this wide range of services is an ongoing struggle for most countries, particularly in the current global economic crisis. Increasing access to water supply and sanitation, ensuring the environmental sustainability of water ecosystems, reducing the impacts of floods and drought, and maximising access to safe water for societal welfare require financial support.

Sustainable financing lies at the heart of many of the solutions to improved water management. Aligning incentives through the use of tariffs and water prices is a key feature, as is securing private sources of funding. The need for sound governance arrangements to underpin the financial sustainability of the sector is equally essential: good governance and financial sustainability are inextricably linked.

Understanding the benefits of improved water and sanitation helps to make the case for reforms to ensure financial sustainability. Access to clean drinking water and sanitation reduces health risks and frees-up time for education and other productive activities, as well as increases the productivity of the labour force. Safe wastewater disposal helps to improve the quality of surface waters with benefits for the environment (*e.g.* functioning of ecosystems; biodiversity), as well as for economic sectors that depend on water as a resource (*e.g.* fishing, agriculture, tourism). Such benefits usually outstrip the costs of service provision and provide a strong basis for investing in the sector. In **developing countries**, WHO estimated that achieving the MDGs for water and sanitation could generate an estimated USD 84 billion per year in benefits, with a benefit to cost ratio of 7 to 1.

The investment needs in OECD, transition and developing economies differ but all remain significant. Despite a high initial asset base, **OECD countries** confront huge costs of modernising and upgrading their systems, so as to comply with increasingly stringent health and environmental regulations, maintain service quality over time, ensure the security of water supplies in response to climate change, pollution and growing populations, and in some cases, overcome the neglect and under-financing of earlier years. This could cost 0.35%-1.2% of GDP a year over the next 20 years. In **EECCA countries** (Eastern Europe, Caucasus and Central Asia), much of the existing infrastructure is old and over-sized for present needs, and is ill-suited to economic and demographic realities. It is estimated that around EUR 7 billion would be required annually for operation, maintenance and capital investments, which was roughly double available financing in 2006. But the need for investment is perhaps the most urgent in **developing countries**. It is estimated that the annual investment to meet the MDG target is USD 18 billion, although this is dwarfed by the estimated annual cost of maintaining existing services of USD 54 billion. More than 75% of annual needs to attain the MDG target for water and sanitation relate to the maintenance and the replacement of existing infrastructure.

Closing the financial gap requires countries to mobilise financing from a variety of sources, which may include reducing costs (via efficiency gains or the choice of cheaper service options), increasing the basic sources of finance that can fill the financing

gap, *i.e.* tariffs, taxes and transfers (commonly referred to as the "3Ts"), and mobilising repayable finance, including from the market or from public sources, in order to bridge the financing gap. While the case for such reforms to ensure financial sustainability has been largely accepted in recent years, there is still a long way to go to implement the mechanisms. For example, improving the efficiency of operations can help to redress important losses of funds within the sector. Operational inefficiencies include poor revenue collection, distribution losses (referred to as leakage or non-revenue water), labour inefficiencies and petty corruption. In addition, the choice of hardware and technologies can make a big difference to costs. In **OECD countries**, the regulatory regime in place can critically influence the selection of investment options, and the resulting investment cost. For many **developing countries**, particularly in Sub-Saharan Africa, it is necessary to examine the broad range of options along the service ladder in order to assess the tradeoffs between affordability and investment costs when delivering improved water and sanitation.

As is now well-recognised, the 3Ts are the ultimate sources of finance for water and sanitation services (WSS). The 3Ts can also be used to leverage, and eventually repay or compensate, other funding sources, principally loans, bonds and equity. Each country is likely to adopt a different mix of the 3Ts to meet their financing needs. Most countries have used public transfers (either from their own government or from external sources) to fund the development of WSS, particularly for capital expenditure. As countries develop and WSS become more mature, there tends to be a shift towards more use of commercial finance, reimbursed by growing cash flows from user charges (*i.e.* tariffs). The next crucial step lies in the further implementation of the 3Ts in a wider range of countries. But this can only be done in conjunction with broader reforms to ensure the appropriate governance and regulatory arrangements are in place. In addition, while revenues from the 3Ts can close the financing gap for water and sanitation services, repayable finance can be used to bridge the financing gap. WSS providers usually look to mobilise repayable finance in order to finance capital expenditure for repairs, renewals or expansion of water and sanitation systems while ongoing operating costs and ordinary maintenance are routinely financed from a mix of the 3Ts.

The private sector has a significant role to play in helping to mobilise financing for the water sector. Formal and informal WSS operators, private financial institutions, and private companies can all help by improving overall sector efficiency (thereby reducing costs and financial needs) and improving the sector's creditworthiness and ability to attract financing; financing investment costs (particularly when the public sector's ability to borrow is limited); and managing and enabling the capital programmes of public authorities.

The financing challenge goes beyond ensuring the financial sustainability of the water services sector and encompasses the financing of water resources management functions of governments. WSS sits within a broader water value chain and is critically linked both upstream and downstream to the water resource base. Government management of that water resource base is central to the environmental and financial sustainability of the sector. Looking across the range of functions that water resources management entails – both the "hard" infrastructure functions and the "soft" governance functions – it is clear that countries face important social choices related to financing water resources management. Identifying benefits and beneficiaries, distinguishing between public and private costs, and applying a range of instruments based on the user pays (or beneficiary pays) principle is key to meeting this financial challenge, in addition to seeking cost savings in water resources management.

Ultimately, it is essential for governments to take a strategic approach to financing water investments and services. Strategic financial planning must be carried out in the context of broader sector planning that address roles and responsibilities of government agencies, policy priorities and related legislative and regulatory reforms in order to ensure that a package of measures that can realistically be financed is being put forward. In order to deal with those challenges, governments have to set realistic objectives for the development of the WSS sector, checked against available resources, and agreed in a multi-stakeholder policy dialogue. Strategic financial planning provides a structure for a policy dialogue to take place, involving all relevant stakeholders including Ministries of Finance, with the aim of producing a consensus on a feasible future WSS. It illustrates the impact of different objectives and targets in a long term perspective, linking sector policies, programmes and projects. It also serves the important aim of facilitating external financing, providing clear and transparent data on financing requirements.

To provide support to governments and water and sanitation service providers, the OECD (in conjunction with a number of other international organisations) has developed a series of tools, including financial tools, benchmarking tools and guidelines with a view to improve the performance of utilities. These include:

- Strategic Financing Planning, based on the FEASIBLE tool
- The Financial Planning Tool for Water Utilities (FPTWU)
- The Multi-Year Investment Planning Tool for Municipalities
- Guidelines for Performance-based contracts
- Water Utility Performance Indicators (IBNet)
- The Checklist for Public Action for Private Sector Participation in Water Infrastructure.

Meeting the water governance challenge

While many of the solutions to meeting the water challenge (such as water pricing, water markets, financial planning) do exist and are relatively well-known, the rate and scope of take-up of these solutions by governments in OECD and non-OECD countries has been uneven, in short because they were not tailored to fit the local contexts.

Water is essentially a local issue and involves a plethora of stakeholders at basin, municipal, regional, national and international levels. In the absence of effective public governance to manage interdependencies across policy areas and between levels of government, policy makers inevitably face obstacles to effectively designing and implementing water reforms related to institutional and territorial fragmentation, badly managed multi-level governance, limited capacity at the local level, unclear allocation of roles and responsibilities, and questionable resource allocation. Insufficient means for measuring performance have also contributed to weak accountability and transparency. These obstacles are often rooted in misaligned objectives and poor management of interactions between stakeholders.

The trend towards the decentralisation of water policies in the past decades has resulted in a dynamic and complex relationship between public actors at all levels of government. To varying degrees, OECD countries have allocated increasingly complex and resource-intensive functions to lower levels of government. Despite these greater responsibilities, sub-national actors do not always have the authority over the financial allocation required to

meet these needs, or the capacity to generate local public revenues. Meanwhile, the central government may not find it easy to develop and assess water resources and service strategies without obtaining information from sub-national governments and building, developing and reinforcing capacity at local level.

There is a pressing need to take stock of recent experiences, identify good practices, and develop pragmatic tools across different levels of government and other stakeholders Although institutions in charge of water management are at different developmental stages in different countries, common challenges – including in the most developed countries – can be diagnosed ex ante to provide adequate policy responses. The OECD has examined the issues arising from the multi-level characteristics of water governance in order to better understand *who* does *what*, at *which level* of government, and *how* in terms of water policy design, regulation and implementation. It also proposes a "reading template" to diagnose common multi-level governance bottlenecks for integrated water policy across OECD countries, as well as governance instruments adopted in response for managing mutual dependencies across levels of government and building capacity at the local level.

In order to move forward on addressing the multi-level governance challenges, **the OECD has proposed a tentative set of guidelines that are intended to serve as a tool for policy makers to diagnose and overcome multi-level governance challenges** in the design and implementation of water policy. These guidelines can help enhance the prospects for crafting successful water reform strategies in the future. They are intended as a step towards more comprehensive guidelines that may be built on in the future, based on in-depth policy dialogues on water reform with countries and recognised principles of water policy, economic bases and good governance practices:

- Diagnose multilevel governance gaps in water policy making across ministries and public agencies;
- Involve sub-national governments in designing water policy;
- Adopt horizontal governance tools to foster coherence across water-related policy areas and enhance inter-institutional co-operation across ministries and public agencies,
- Create, update and harmonise water information systems and databases for sharing water policy needs at basin, country and international levels;
- Encourage performance measurement to evaluate and monitor the outcomes of water policy at all levels of government;
- Respond to the fragmentation of water policy at the sub-national level by facilitating co-ordination across sub-national actors and between levels of government;
- Foster capacity-building at all levels of government;
- Encourage a more open and inclusive approach to water policy making through public participation in water policy design and implementation; and
- Assess the effectiveness and adequacy of existing governance instruments for co-ordinating water policy at horizontal and vertical levels.

Meeting the water coherence challenge

The nexus between water, energy, food and the environment presents significant challenges for water policy reform efforts, and has been attracting increasing policy attention in recent years. Increasing the coherence of policies across these areas is essential if governments wish to meet the range of policy goals while not undermining the sustainability of the water resource base.

The linkages between water and energy are important and pervasive. The importance of water in energy production and use (such as for hydropower, thermal power stations, biofuels) is matched by the importance of energy in water (through pumping and transfer of water, desalination). As countries confront water resource constraints, their arsenal of policy options has typically included energy-intensive solutions such as long-haul transfer and desalination. The corollary is also true: many countries address energy constraints with water-intensive options such as steam-cycle power plants or biofuels. However, this approach, whereby water planners assume they have all the energy they need and energy planners assume they have all the water they need, is not likely to work effectively in the future. Countries that deploy incoherent water and energy policies might find themselves with severe scarcity of one resource or the other, or both.

Similarly, **water and agriculture are inextricably linked**, not least because agriculture accounts for around 70% of water use globally. Support provided to lower the costs of water supplied to agriculture, for example, by not reflecting the scarcity value of water, can undermine efforts to achieve sustainable management of water, especially in situations experiencing water stress. Agricultural support policies linked to production can also exacerbate off-farm pollution through providing incentives to intensify and extend production more than would be the case in the absence of this form of support. But isolating and quantifying the overall economic efficiency and environmental effectiveness of agricultural support on water is difficult and further analysis on causation is needed.

Policies across water, energy, agriculture and environment are often formulated without sufficient consideration of their inter-relationship or their unintended consequences. The silo nature of many governments' approaches to policy development in the different areas is the key contributor to this incoherence. Institutional arrangements need to be re-engineered to create a greater intersection of policy development, implementation and monitoring in these areas. But differences in the institutional arrangements add to the complexity. For example, in many countries water regulation has been pushed towards sub-national jurisdictions (municipal and state water governments), while the majority of energy regulation and investments remain within the power of federal or national agencies. However, the emergence of environmental issues as a policy driver has also had impacts on institutional settings, with a number of countries creating ministries that combine energy and environment, or agriculture and environment.

The **key obstacles to moving toward greater policy coherence** can therefore be summarised as:

- difficulties and failure to adequately address the complexities of energy, agriculture and water linkages;
- differences in spatial and temporal scales between energy, agricultural and water policies (*e.g.* forward-looking water plans are often on the 50-60 year horizon, whereas energy plans are up to 20-30 years ahead, and agricultural planning is generally within a much shorter time horizon).

- incoherencies between certain energy and agricultural policies and current water policies, acting to constrain opportunities to move toward the sustainable management of water; and
- inconsistencies and rigidities in the institutional structures that govern the energy, agricultural and water sectors.

From a governance perspective, **policy coherence therefore requires ensuring vertical and horizontal co-ordination across and between levels of government.** It means addressing the whole life cycle of water policy across the different policy spheres to foster an overall strategic approach that can deliver effective, efficient and sustainable policies. Achieving this outcome requires strong mechanisms, tools and processes to manage and co-ordinate policy, budgeting and regulatory development, but also high political commitment and leadership, cultural changes, monitoring and learning from international experience and evidence.

Success in achieving greater coherence between energy, agriculture and water policies will ultimately depend on removing policy inconsistencies, especially where energy and agricultural support policies conflict with sustainable water management goals. The pursuit of policy coherence will also depend on developing relationships by connecting farm, firm, catchment, national and international scales of policies and institutions. This will inevitably involve a vast range of stakeholders who are unlikely to have interacted closely in the past. Encouraging greater co-operation across these stakeholders will require developing mutual understanding, so that policy and institutional coherence can be fostered to achieve the sustainability of energy, agriculture and water systems.

Options to enhance policy coherence include exploiting win-wins (such as taking steps to increase both water and energy efficiency), managing trade-offs where conflict cannot be avoided, and reconciling conflicts between sets of objectives. It will also require strong political commitment and leadership. Depending on national circumstances, pursuit of these options will require a significant re-calibrating of policy frameworks, including:

- Unravelling policy and institutional legacies and paying greater attention to current pricing and subsidy structures for agriculture, water and energy that may be currently reducing policy coherence and providing conflicting incentives;
- Examining the potential for institutional re-organisation, with a greater degree of co-ordinated planning;
- Enhancing data collection and analysis, and developing information support systems for stakeholders and a strong evidence base for policy makers;
- Greater public consultation, including the development of a shared vision among relevant stakeholders – farmers, water industry, environmental groups, the agro-food chain, and energy interests;
- Expanding the impact assessment of policy coherence through ex ante and ex post evaluations of policies;
- Increased use of regulatory analysis requirements managed by central and arms-length government agencies to improve co-ordination and facilitate a thorough examination of the optimal policy mix;
- Steps to improve policy coherence at the implementation end of the policy process; and
- Communicating the benefits of policy coherence.

More coherent policy approaches are slowly beginning to take shape in a growing number of OECD countries. This is particularly evident with climate change as many countries have started to co-ordinate the previously separated policy domains of energy policy, water policy, flood and drought management policies, and agri-environmental policies. For example, lowering overall agricultural support and shifting from direct production and input agricultural support to decoupled payments over the past 20 years in many OECD countries that has, in part, led to improvements in water resource use efficiency and helped to lower water pollution pressure from agricultural activities. But much more needs to be done in both OECD and non-OECD countries.