

Guest Editorial: Water—A Global Challenge and a Priority for the OECD

Access to safe water and basic sanitation represents one of the greatest challenges facing humanity in the 21st century. Success in addressing that challenge would act as a catalyst for progress in public health, education and poverty reduction and as a source of economic dynamism. It would give a decisive impetus to the Millennium Development Goals—the targets adopted by governments as part of a global partnership for poverty reduction.

Approximately 80% of all diseases in developing countries are water-related, leading to an estimated 1.7 million deaths each year. The World Health Organization estimates that every dollar invested in water supply and sanitation could yield between US\$5–10 in economic benefits, and even more for low cost measures. Better water increases people's health and their ability to find employment and revenue to escape the poverty trap, and it helps free-up time for children, especially girls, to go to school.

Due to water's simultaneous productive and destructive nature, a vicious cycle can set in when countries are unable to properly harness their water resources, due to insufficient investment in infrastructure and/or inadequate management. In these cases, water can become a limiting factor to growth, as has been demonstrated by studies linking instability in gross domestic product (GDP) growth with water availability cycles (e.g. in Ethiopia). These challenges are further exacerbated by the prospects of climate change, which is reducing mean water availability in some regions, while increasing the variance of precipitation and thus giving rise to more frequent, and often more destructive, extreme events (droughts and floods). Indeed, the recent impact report of the Intergovernmental Panel on Climate Change points to an alarming future.

It is only by working together across countries and sectors, including all levels of the public administration, as well as the private sector and civil society, that we will be able to take the path leading to a virtuous circle of sustainable water use, access of adequate and affordable services for all, and sustained economic and human development. The Organization for Economic Cooperation and Development (OECD) intends to play a role in facilitating this process.

Water is a Global Challenge that Needs to be Addressed on Several Different Fronts

The demand for water is expected to increase by an unprecedented 50% in the next 30 years. According to the World Water Council, by 2025, about 3.5 billion people could be living in water scarce or water stressed areas, compared to 1 billion in 2005. Most of the increased demand for water will occur in the developing world, and especially in rapidly

Table 1. Estimated average annual world infrastructure expenditure (additions and renewal) for selected sectors, 2000–30, in US\$ billion and as a percentage of world GDP

Type of infrastructure	Approximate % of world GDP		Approximate % of world GDP		Approximate % of world GDP	
	2000–10	2010–20	2010–20	2020–30	2020–30	2020–30
Road	220	0.38	245	0.32	292	0.29
Rail	49	0.09	54	0.07	58	0.06
Telecoms ^a	654	1.14	646	0.85	171	0.17
Electricity ^b	127	0.22	180	0.24	241	0.24
Water ^{a,c}	576	1.01	772	1.01	1037	1.03

Notes: ^a Estimates apply to the years 2005, 2015 and 2025.

^b Transmission and distribution only.

^c Only OECD countries, Russia, China, India and Brazil are considered here.

Source: OECD (2006).

growing countries such as Brazil, Russia, India and China (the so-called BRICs). The challenge posed by the provision of adequate and affordable water and sanitation services in developing countries is embodied in Targets 10 and 11 of the Millennium Development Goals (MDGs), which call for a 50% decline in the proportion of people without sustainable access to safe drinking water and basic sanitation by 2015.

Water is also a serious challenge for the developed world, where significant water losses are due to inadequate maintenance of and reinvestment in water supply systems, wasteful use encouraged by the under-pricing of water, and failure of providers to improve water systems management and technology. A recent OECD report estimates that France and the UK will have to increase their spending on water as a proportion of GDP by about 20% just to maintain water services at their current levels, while Japan and Korea may have to increase their water expenditures by more than 40%.

The projections for annual investment requirements in water systems until 2025 point to significantly higher levels of investment requirements than previous studies suggested. In OECD countries and the BRICs, it is projected that annual expenditures in the range of US\$770 billion will be needed up to 2015 and over US\$1 trillion by 2025.¹ The water infrastructure sector will require the largest investment, ahead of road, rail, telecoms and electricity (excluding generation). Much of this spending in Europe and North America will be on system maintenance, repair and replacement rather than on the extension of networks, since water systems in these countries are old and often in poor condition.

It is primarily in the developing world that investment in new sources of supply and a considerable expansion of networks will be required. In Africa, according to the OECD Development Centre's *African Economic Outlook*, the abundance of water on the continent remains unexploited due to a deplorable lack of infrastructure, e.g. dams. The sanitation situation is even worse. If present trends were to continue, by 2015, 370 million people in sub-Saharan Africa would lack access to safe drinking water and 550 million to improved sanitation. Even if sub-Saharan Africa were to meet the MDGs in this area, which seems unlikely, by 2015 some 240 million people would still lack access to safe drinking water and 350 million to basic sanitation.

As the world's population and output grow, meeting human water needs will have to contend with growing, and increasingly conflicting, demands for water by productive sectors. Improving water use in the agriculture sector, which accounts for more than 80%

of global water use, is therefore also crucial in our quest to providing adequate access to water and sanitation services, while meeting the needs of a growing global economy and ensuring proper stewardship of our planet's water resources.

In the forthcoming decades feeding the growing world population and satisfying its need for raw materials will call for increased output from both irrigated and rainfed agriculture. Some of this may come from an increase in irrigated area, but the scope for this will be much more limited than in the past. Most of the additional output will have to come from a more efficient use of water and from an increase in the productivity of each unit of water being used ('more crop per drop').

Addressing these challenges requires a concerted effort on many fronts on the part of all involved. The need to ensure access to water and sanitation and an efficient allocation of the resource across different economic sectors will test our ability as policy makers, farmers, industrial leaders and consumers to work together, not only within our individual countries but among countries around the world, to prevent this grim possibility of serious water shortages, and water conflict, from becoming a reality. The participation of all parts of society is of the utmost importance.

At the OECD we have made water a priority and are working to develop policy options and identify best practices to assist developed and developing countries meet future water needs in a sustainable way and thereby help avert a global crisis. As an economic organization, the OECD has a comparative advantage in addressing key areas where advancement is needed, i.e. the use of economic instruments for water resources management, to encourage an efficient allocation and use of the resource, help finance new infrastructure to increase water availability, and ensure the financial viability of service provision.

Getting the Prices Right and Encouraging More Efficient Water Use

A first step towards meeting the global water challenge is conceiving our water resources as a common heritage that needs to be protected. Unrestricted, unregulated access to them for abstraction or effluent dilution cannot be accepted, and appropriate institutional solutions must be found to ensure water use that is (a) fair; (b) economically efficient; and (c) environmentally sustainable. Only meaningful participation by all stakeholders in the decision-making process concerning the allocation of scarce resources will ensure that all three objectives are met. The use of economic as well as regulatory instruments will help increase awareness about the scarcity of the resource and encourage virtuous behaviour regarding its use. Abstraction charges that encourage efficient water allocation and use are one such instrument. The use of a water trading scheme in the Murray-Darling river basin in Australia has helped to more than halve the economic impact of a severe drought and similar positive effects have been achieved through the introduction of water markets in some parts of Chile. The menu of options available to policy makers is broad, including such market-based mechanisms as tradable water use permits, or regulatory instruments such as permits whose reallocation may be subject to regulated negotiations and compensations. The use and combination of such tools will depend on country-specific conditions such as the legal environment, structure of the economy, and, crucially, on data availability. OECD can play an important role in identifying and disseminating best practices in terms of the integrated use of water management instruments.

A second step towards a solution is reaching an agreement that adequate service provision to all is everybody's responsibility, but that beneficiaries should appropriately

contribute to it. Water service provision is not charity. Final beneficiaries should have a say in terms of what service levels they receive, of the quality of such services and of the efficiency and effectiveness of their providers. To this end, they must also participate to making such services financially sustainable. The financial and managerial viability of service providers is crucial if we want to harness adequate resources to the sector, particularly in countries where risk perception is high. The key question, and one that OECD is posited to answer, is how to design tariff structures that ensure revenue efficiency while at the same time ensuring the affordability of services to all.

Pricing is the first instrument at the disposal of water managers to cover the costs of operating, maintaining, renewing and extending water systems. Ensuring the financial viability of providers also gives an incentive for the development of new technologies and for greater participation by private investors and/or operators, when this is deemed appropriate. While fuller cost recovery can be attained in most OECD countries in the short term, a longer transition towards fuller-cost recovery pricing may be needed in many developing countries in order to help overcome affordability constraints for some population groups. This may involve significant public budget spending, particularly to cover investment costs, for some time to come. However, a better understanding of how different tariff structures meet the revenue efficiency and the affordability objective is required. The OECD is in a good position to advance in this respect. In any event, measures need to be undertaken to deal with social problems, such as ensuring affordable access by the poorest to adequate water supply and sanitation.

Making consumers of water pay for the full (or fuller) cost of water supplies is also an effective policy instrument to encourage responsible use. Over a decade, Denmark reduced per capita consumption of water by 20% through fuller cost pricing. Through effective demand management we can reduce the level of investment needed to provide additional water supplies. This is particularly important in agriculture, where the use of water for irrigation, which accounts for the greatest use of water in the world, is generally under-priced, leading to wasteful use. Eliminating wasteful uses of water and giving users, especially industry and agriculture, a greater incentive to find ways to use less water, is an essential part of any effective water management strategy.

To achieve this, physical losses in irrigation systems will need to be reduced, and the use of efficient irrigation technologies that apply water to crops more efficiently will need to be extended. It is often easy to reduce irrigation water use by 30–40% by simply reducing losses in the distribution network. Water use is also affected by policies that are not directly water-related. Positive impacts on the use of water in agriculture, for instance, can also be derived from improvements in other aspects of the production and distribution cycle that ensure an increase in the amount of crops that actually reaches final consumers. On the other hand, the support instruments available to farmers may provide adverse incentives for the switch to water-saving technologies or to less water-intensive crops. The OECD is currently working to identify best practices in the pricing and financing of water in order to support countries' efforts in these areas.

Meeting the Investment Challenge through the Mobilization of All Available Sources of Funding

The OECD considers it has a responsibility to support better access to water supply and sanitation also in the developing world. Official Development Assistance (ODA) is an

important source of financing for water services provision in some developing countries. Data from our Development Assistance Committee (DAC) show that OECD countries allocated US\$4.6 billion to the water sector through bilateral ODA in 2005, and multilateral donors' commitments amounted to an additional US\$1.4 billion. This represented an increase over the previous years, reversing the downward trend in ODA to the water sector that had been seen since the mid-1990s. However, there is no sign of increased prioritization of the water sector in bilateral ODA. The share of aid to the water sector in total ODA declined from 8% in 2000–01 to 6% in 2002–03 and was back to its previous 8% level in 2004–05. Furthermore, the majority of ODA to the water sector is targeted to only a few countries, with some of those most in need of it receiving a relatively small share of aid flows. More than half of ODA allocations to the water sector in 2004–05 were directed to Asia, while the share of recipients in Sub-Saharan Africa was 24%.

ODA has an important role to play in supporting the water sector, particularly for the poorest countries where needs are greatest. This includes, in particular, support to develop governance structures and the capacity to plan, develop and manage water supply systems on a sound financial basis. But ODA can only ever be a *part* of the financing needed for the water supply and sanitation sector, and often only a small part, although it can play an important catalytic role. It cannot substitute for other public, private, domestic and foreign sources of finance but it can contribute to increase funds dedicated to this sector.

To ensure a sustainable financing base, in the long term the bulk of financing will need to come from water charges and public budgets. But adequate supply of finance is not everything. In a sector that is prone to poor management, it is essential to ensure that available resources are used in the most effective manner. At the OECD we are working with developing countries and donors to develop strategic financial plans for water supply and sanitation through national dialogue processes that involve all relevant stakeholders. The work aims to develop guidance for beneficiary countries and donors on good practices and approaches that can be used to support effective policy dialogue on the financing of water supply and sanitation in developing countries. Ultimately, these approaches should be used to support the development of sector-wide approaches (SWAps) and a better integration of water into governments' Medium Term Expenditure Frameworks. Work undertaken in some countries of the former Soviet Union is already showing encouraging results by forging political consensus about sector objectives and priorities and by identifying the contributions that different sources of finance will need to make to achieve these.

There is also a need to look beyond the usual sources of funding. The private sector has a role to play, either by providing financing to support infrastructure development or by working together in public-private partnerships to finance, build, manage or operate water service facilities. However, the overall financial volume of public-private partnership water projects in developing countries has dropped in recent years, from a peak in 1998 of US\$1.6 billion to only about US\$1 billion in 2004. At the same time, the level of responsibility, in particular financial responsibility, taken by the private sector has decreased (shifting from concession to management contracts). This reflects a more risk averse attitude because a number of public-private partnerships in the sector have failed in the past.

To ensure successful private sector participation, the investment and contract conditions need to be carefully negotiated to ensure that both parties gain from the partnership, i.e. the provision of reliable water services at affordable costs for the government partners, and

a financially attractive investment opportunity with an acceptable risk structure for the private sector. The OECD has recently launched the OECD Principles for Private Investor Participation in Infrastructure that provide guidance to governments wishing to increase private participation in these sectors and is now working to adapting these principles to the water sector.

As stated earlier, channelling sufficient funding for investment to the water sector will also be a challenge for the most developed countries. Relying on 'business-as-usual approaches', which depend on public funding to a large extent, is unlikely to be sufficient to meet these new financial challenges. Therefore, the OECD is exploring innovative business models that might help mobilize the significant investment that is needed. Pension funds and other institutional investors are seeking opportunities to put their capital to work on projects that generate low-risk income streams. New technologies could allow the viability of water infrastructure at a much smaller scale than is currently the case, thereby allowing property developers and other private investors to play a greater role in the financing of water infrastructure. Some property developers in developing countries with poor public water services already incorporate certain water and wastewater treatment facilities into their investment in order to improve property prices. Such new ways of financing can contribute to meeting future water supply and sanitation needs, but it is important to ensure that such decentralized solutions are consistent with water quality standards and pricing procedures set out by public authorities.

Protect Water Resources More Effectively to Ensure Sustainability

A crucial aspect of water management is the protection of the resource to ensure the preservation or restoration of acceptable quality levels and its continued availability in the long run. One of the main challenges in this regard is improving the integration of environmental concerns in sectoral policies. Water quantity and quality problems caused by agriculture, in particular, raise questions about the sustainability of some of the current policies and practices in this sector in a number of countries where demand for water is growing while its supply is decreasing. In arid regions of several OECD countries, the scarcity of water has become a limiting factor on development, which can be exacerbated by recurrent droughts. A change in production methods will often be required, which is mostly beyond the direct reach and responsibility of water managers and requires coordinated approaches across sectors. Beyond agriculture, this calls for the identification of integrated solutions that increase the resilience of water systems at the basin level in the face of changing climactic conditions and mounting economic and demographic pressures.

Some results have been achieved already, even though the situation is not yet satisfactory. Most OECD countries have made large efforts to clean-up effluent discharges, and to protect and restore water resources in the last few decades. During the last decade, Spain increased the share of rivers that meet good physical-chemical quality from 52% to 62%. Good progress has been made in other OECD countries, too, although the diversity among member countries with respect to economic and social development, institutional structures and culture accounts for considerable differences in the environmental results achieved to date. Nevertheless, the considerable water management efforts of recent decades have not been enough and significant steps are still required, i.e. to improve wastewater management and restore aquatic systems. In order to support these

efforts, the OECD is carrying-out regular environmental performance reviews, usually including a chapter on water, that point out where progress has been achieved and where additional efforts are required.

Charting the Course towards a Solution

Facing the challenge of providing adequate access to water and sanitation services, while meeting the needs of a growing global economy and ensuring proper stewardship of our planet's water resources, is not impossible. However, it requires a concerted effort on many fronts on the part of all involved.

First, a profound change in our attitude vis-à-vis our water resources and a consequent shift in behaviour is needed. We all need to agree that water resources are a common heritage that needs to be protected, that unrestricted access to them cannot be accepted, and that appropriate management tools must be put in place to ensure sustainable, fair and efficient water use. Meaningful participation by all stakeholders in water management, and the integration of economic and regulatory instruments, are needed to encourage virtuous behaviour regarding its use. OECD can play an important role in identifying and disseminating best practices in the use of water management instruments.

A second set of principles around which agreement is needed concerns water and sanitation service provision. Ensuring access to adequate and affordable services for all is everybody's responsibility, but the corollary of this is that final beneficiaries should also appropriately contribute to it. Ensuring the financial and managerial viability of service providers is crucial to mobilize adequate resources for the sector, particularly in countries where risk perception is high. The key question that OECD is working on is how to design tariffs that reconcile revenue efficiency and affordability.

Behavioural changes are not only required from water users, but also from government agencies at all levels, e.g. to ensure that both water and sanitation and hygiene receive proper attention in budgetary allocations, or to reduce the level of interference with management of service provision for political motives. New ways must be identified to engage the international and local private sector in the sector, or to identify and scale up the entrepreneurial initiatives that exist even in lower-income areas. Innovative solutions that bring increased financial and management resources to the sector need to be identified, and the eventual constraints for their adoption need to be reduced. Among others, this requires information sharing and cooperation between all relevant stakeholders. The OECD is actively involved in dialogue with governments, NGOs and representatives of the private sector to contribute to this process.

Putting in place the institutions, management instruments and other components of this multi-faceted solution is far from simple. However, it is possible if all involved agree about the goals and about embarking together on this arduous journey.

I hope that with the efforts that are now underway in the Organization that I have the privilege of leading, and that involve many of the best experts in academia, government, NGOs and the private sector, we will be able to make a significant contribution to moving this important agenda forward.

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Note

1. It should be noted that these figures are necessarily much larger than the finance that has been estimated to be required to achieve the water-related MDG (approximately US\$30 billion), as it covers a much broader array of costs, including financial needs in the OECD (with much more sophisticated and expensive infrastructure) and financial requirements for operation, maintenance and rehabilitation of existing infrastructure which are usually not included in MDG estimates.

Reference

OECD (2006) *Infrastructure to 2030—Telecom, Land Transport, Water and Electricity* (Paris: OECD).