

# Roundtable on Financing Water

## OECD-WWC-Netherlands Roundtable on Financing Water

Inaugural meeting 12-13 April 2017, Paris

### Session 3. Converting economic benefits of water security investments into financial returns

#### Background paper

Improvements in water security<sup>1</sup> generate a range of public and private benefits in terms of valued goods and services as well as reduced water-related risks (risk of shortage, floods, degradation of water quality and freshwater ecosystems, and inadequate access to water supply and sanitation). Such investments can result in significant avoided costs of water-related risks. For example, water shortage can impose substantial costs or result in reduced revenues<sup>2</sup> and benefits for agriculture, energy, manufacturing and other economic sectors as well as for drinking water provision, nature conservation and recreational uses. Improving the financial case for investment requires converting the benefits from investments in water security into revenue streams. The financial case can also be improved using economic instruments to internalise negative externalities of activities that increase water risks, such as pollution.

The benefits from investment in water security accrue to distinct sets of beneficiaries. At an aggregate level, investments in water security should seek to maximise social welfare. But determining how such investments should be financed and how benefits can be used as a basis for cost recovery requires an understanding of what *types* of benefits an investment generates and *who* benefits from them. This can help to distinguish between investments (or parts of investments) that generate public goods where the benefits accrue to society broadly, such as water resources management and ecosystem preservation, and investments that generate private goods and services, such as water supply and sanitation services that directly benefit households and firms who enjoy the service. Many water security investments, most notably multi-purpose infrastructure, provide a number of these public and private goods at the same time.

The more varied and far-reaching the benefits from investments in water security are, the more difficult they are to quantify and value in economic terms (Whittington et al, 2013). The benefits of water security investments that deliver private goods and services are more easily monetised to generate a revenue stream that form a basis for cost recovery. Thus, they can potentially draw on a wider range of financing modalities, from both governments and commercial sources. However, financing options for public goods are more limited. Major projects of water infrastructure with long term strategic benefits, including multi-

---

<sup>1</sup> See the background paper for Session 2 for a more detailed definition of water security.

<sup>2</sup> For example, in the Netherlands, one of the largest net exporters of agricultural products in the world, estimates of economic loss to the Dutch agricultural sector may reach EUR 700 million in a “dry year” (frequency of 1 out of 10 year) and EUR 1 800 million in an “extreme dry year” (frequency of 1 out of 100 years). These figures are equal to 0.1% and 0.3% of GDP respectively (Jeuken et al, 2012).

purpose infrastructure, will normally need a contribution from public finance, with possible participation by private investors and commercial lenders (Winpenny, 2015).

The User Pays Principle (or Beneficiary Pays Principle) calls upon the user of a natural resource or the beneficiary of a service to bear the cost. It takes account of the opportunity cost related to using public funds for the provision of private goods that users can afford. Water users are not the only beneficiaries of investments in water security. For instance, improved flood protection or the extension of urban water infrastructure can benefit property developers, who will extract the economic rent of the rise in property values as a result of these investments.

Identifying the drivers of water-related risks (e.g. industries that pollute water or urban development that increases flood risk) can help to identify who (if anyone) is accountable for additional water-related risks and how they could potentially contribute to the cost of needed investment to manage them. For example, the Polluter Pays Principle states that the polluter should bear the cost of measures to reduce pollution according to the extent of either the damage done to society or the exceeding of an acceptable level (standard) of pollution. Policy instruments, such as pollution taxes, can be used to internalise these negative externalities, thus providing an incentive to reduce pollution and a source of tax revenue.

There is a diverse range of instruments available to policy makers to recover the costs of investment in water security and provide a revenue stream for investors. These include tariffs for water and sanitation services, abstraction charges, pollution taxes, taxes on impervious surfaces that contribute to storm water run-off and taxes on urban development in floodplains. Payments for ecosystem services can be used to compensate improved resource management that provides water security benefits. Value-capture mechanisms can also be used to extract a portion of the economic rent arising from the growth in property values associated with (and partly generated by) the expansion of public services, including investments in water security. Examples of such mechanisms include property taxes, betterment levies and capital gains taxes. In designing policy instruments, it is important to consider equity issues, in particular affordability, especially when water bills are disproportionate with stakeholders' capacity to pay.

The remainder of this paper provides a few selected examples of how the benefits of investments from water security can be converted into revenue streams that improve the risk-return profile of investments.

### ***Land development taxes in Casablanca, Morocco***

Casablanca has used a value-capture mechanism, in combination with water user tariffs, to finance new investment in water supply and sanitation services and flood protection needed to cope with rapid urbanisation. The city's population is expected to grow from around 3.5 million today to 5 billion by 2030, requiring the extension of the water network, securing access to the resource and protecting urban developments against frequent floods (OECD, 2015a).

A new investment programme adopted in 2007 uses revenue from user tariffs to cover operational and maintenance costs and the renewal of existing assets (accounting for 70% of total cost of investment over the last decade). In addition, a dedicated account covers the remaining costs (essentially land acquisition, network extension and connections to lower income areas). This is financed mainly by contributions from property developers, who account for a growing share of total investment, increasing from 7% in 2004 to 54% in 2014 (OECD, 2015a).

Property developers also cover a portion of the costs of connecting properties to the network and in-house equipment. Their contribution varies according to the type of housing (social housing, villas, hotels and industrial zones) and is assessed as a share of the price of the property when sold, ranging from 0.7% of the selling cost for social housing to 1.3% for luxury apartments and buildings. Provisions have been made to adjust the level of the contribution to the pace of urban expansion. Developers also pay additional costs for developments that do not feature in the master plan. Contributions are waived when the developments take place in low income neighbourhoods and slums (OECD, 2015a).

### ***A Public Goods Charge in California's Metropolitan Water District***

A Public Goods Charge (PGC) has been collected since 2002 by the Metropolitan District of Southern California, a consortium of 26 cities and water districts. This charge, called the Water Stewardship rate, is a volumetric fee applied to water users' bills to raise finance to recover the cost of public purpose projects in water conservation, recycling, groundwater pollution clean-up and other local resource management programmes. A similar PGC has also been used in California's electricity sector. Together, the PGCs on electricity and water add a few percentage points to consumers' utility bills (Quesnel and Ajami, 2015).

Quesnel and Ajami (2015) make the case for extending the use of the PGC in California for water as a complement to raising finance through the use of General Obligation (GO) Bonds, the traditional means of funding public goods. A PGC offers several advantages compared to GO Bonds, including providing a more consistent, predictable and less expensive means of raising capital. GO Bonds require voter approval (after first surviving the legislative process) and must be repaid with interest. GO Bonds provide a lump sum to invest, instead of a steady, predictable revenue stream provided by a PGC. Further, a PGC can be applied to water users within a given district, with the proceeds invested in public purpose projects within that district. Thus, the PGC better reflects the beneficiary pays principle than GO Bonds, which are assessed at state level and with proceeds unevenly distributed across the state.

The key to the acceptance of PGCs by California's utility consumers has been financial transparency in the collection and use of the revenues for the stated purposes. Further, environmental issues, including water, have a very high profile in California and the need for innovation and conservation is widely understood. Where transparency in collection and use of the proceeds can be assured and there is broad support to invest in public good functions of water security, a PGC can be an attractive solution (Winpenny et al, 2015; Quesnel and Ajami, 2015).

### ***A suite of revenue generation options for financing green infrastructure in Durham, North Carolina***

Green infrastructure has become an important means of delivering improvements in water quality in Durham County, North Carolina, in the United States. Green infrastructure involves the use of natural or semi-natural systems that use nature's ecosystem services in the management of water resources and associated risks (OECD, 2015b). Around 300 000 people live in Durham county, which encompasses two of the state's most important and at-risk watersheds. The overall water quality improvement strategy has a strong focus on stormwater management, under the responsibility of the City of Durham's Stormwater Utility. Identifying revenue sources that link the beneficiaries of green infrastructure investments to the service provided forms the foundation of the financing strategy.

Hughes (2104) reviews the potential sources of capital and revenue for green infrastructure in Durham. There is a wide menu of options available, such as fees and special district taxes, which can provide revenue sources and thus can be used to repay debt and meet operation and maintenance costs of green infrastructure.

Utilities are permitted to direct some of their revenue from utility customer charges toward green infrastructure, given the benefits these investments generate in terms of improved water quality and quantity. The city also collects stormwater fees that can be used for stormwater management programmes and the county of Durham is authorised to create such a fee, if it chooses to do so. In addition, Durham County benefits from a watershed protection utility fee, collected from customers in the city of Raleigh, which can be used for watershed protection initiatives, including green infrastructure, in Durham County (Hughes, 2014).

Both the city and county can use a portion of property and sales taxes for green infrastructure. There are also several options to raise revenue through special district taxes, such as a stormwater district tax, a business improvement district tax or a watershed improvement district tax. These options provide the city (and sometimes the county) the authority to assess specific district taxes based on the services provided within the district. For example, another city in North Carolina, Chapel Hill, recently created a stormwater municipal service district for a particular part of the city (Hughes, 2014).

In addition to the fees and taxes noted above, financial incentives, such as reduced stormwater fees for non-residential customers, can be used to encourage direct investments by private property owners. Crowd sourced donations may be used to raise funds for specific projects (Hughes, 2014).

For more information, please visit:

[www.oecd.org/water/roundtableonfinancingwater.htm](http://www.oecd.org/water/roundtableonfinancingwater.htm)

[www.oecd.org/water](http://www.oecd.org/water)

*Session 3: questions for discussion*

- Which examples of policies and business models have the most potential for broader application?
- What are the main gaps in our understanding of how to value benefits from water security investments and use these benefits to deliver returns on investment? How can the future work of Roundtable contribute to filling these gaps?
- How can estimates of willingness to pay be improved to inform the design of policy instruments that will be socially and politically acceptable?

## References

- Hughes, J. (2014), *Methods and Strategies for Financing Green Infrastructure: In the City and County of Durham, North Carolina*, University of North Carolina, Environmental Finance Center, October 2014.
- Jeuken, A. et al (2012), “Balancing supply and demand of freshwater under increasing drought and salinisation in the Netherlands”, *Midterm Report Knowledge for Climate Theme 2*, KfC Report, No. 58/2012.
- OECD (2016), *Water, Growth and Finance*, Policy Perspectives, [www.oecd.org/environment/resources/Water-Growth-and-Finance-policy-perspectives.pdf](http://www.oecd.org/environment/resources/Water-Growth-and-Finance-policy-perspectives.pdf) (accessed 22 March 2017).
- OECD (2015a), *Water and Cities: Ensuring Sustainable Futures*, OECD Publishing, Paris, DOI: <http://dx.doi.org/10.1787/9789264230149-en>.
- OECD (2015b), *Water, Innovation and Growth*, Policy Perspectives, [https://issuu.com/oecd.publishing/docs/water\\_and\\_innovation\\_for\\_green\\_grow](https://issuu.com/oecd.publishing/docs/water_and_innovation_for_green_grow) (accessed 27 March 2017).
- OECD (2013), *Water Security for Better Lives*, OECD Studies on Water, OECD Publishing, Paris.
- Quesnel, K. and N. Ajami (2015), *Funding Water in Times of Financial Uncertainty: The Case for a Public Goods Charge in California*, January 2015, Water in the West, Stanford University.
- Whittington, D., C. Sadoff and M. Allaire (2013), *The Economic Value of Moving Toward a More Water Secure World*, TEC Background Paper, No. 18, Global Water Partnership Technical Committee.
- Winpenny, J. et al (2015), *Water: Fit to Finance? Catalyzing National Growth through Investment in Water Security*, Report of the High Level Panel on Financing Infrastructure for a Water-Secure World, April 2015, World Water Council and OECD.