The Roundtable on Financing Water

3rd meeting, 12 November 2018, Paris

Session 2. Mapping Financing Flows: Estimating investment needs and financing capacities

BACKGROUND PAPER

CONSULTATION DRAFT

Background

1. Sound investment planning for financing water-related investments is impeded by a lack of data and patchy information. Projections on financing needs are diverse and can vary by several orders of magnitude. Mapping the flow of finance to investments that contribute to water security[1] can identify the ultimate sources of capital, the level of investment required, who are the different players at different stages, as well as the channels and vehicles to access investment in water security (e.g. green bonds). A more robust evidence base can inform strategic financial planning for water-related investments.

2. To advance analysis of mapping investment flows, the OECD is working with the European Commission to project financing needs for water supply, sanitation and flood protection for the 28 EU member states by 2050. The OECD will also identify the sources of available finance in each country and develop an assessment of financing capacities. This work could be extended to a broader range of countries.

3. The note shares some preliminary lessons from the current project covering EU countries, both in terms of financing needs and capacities at country level. It also provides a brief overview of the methodology developed in the course of this project as well as questions to consider when replicating such a study in other parts of the world.

Questions for discussion

4. Roundtable participants are welcome to comment on rationale, ambition, methodology, and preliminary outcomes. In particular, participants' views on the following issues would be most useful:

- How can a better understanding of investment needs and financing capacities be used to inform strategic financial planning for water-related investments at country level?
- Which elements of the regulatory and policy framework are the most fundamental to ensure the effective use of existing sources of finance and attract additional sources of finance?
- In the absence of a common ambition at regional level (such as the Water Framework Directive in Europe) is SDG6 an appropriate and practical proxy? Are there alternative proxies which could be used?
- The state of existing assets is a major driver for future investment needs, but this is usually poorly documented at national level. Are there practical suggestions for how to overcome this difficulty?

[1] The OECD defines water security as achieving and maintaining acceptable levels for four inter-related water risks: too little water, too much water, too polluted water and the degradation of freshwater ecosystems. These risks to water security can also increase the risk of (and be affected by) inadequate access to safe water supply and sanitation.

A note on method

5. When assessing investment needs for water supply, sanitation and flood risk management in Europe, three directives merit particular attention: the Urban Waste Water Treatment Directive (91/271/EEC); the Drinking Water Directive (98/83/EC); and the Floods Directive (2007/60/EC). In addition to these technical directives, the Water Framework Directive (2000/60/EC) provides framework legislation to facilitate the co-ordination of objectives and means of implementation for water-related policies and regulations.

6. Despite a relatively high level of compliance with this regulatory framework overall, some countries lack funding or face unsustainable financing strategies to achieve full compliance. Further, member states will have to face new challenges, which will call for additional investments in the water sector. Such challenges include climate change, shifting demographics (including shrinking rural populations in some cases) and emerging pollutants – which can lead to more stringent standards for drinking water and treated wastewater.

7. Against this backdrop, the European Commission partnered with the OECD to project investment needs until 2050 and review financing capacities at country level. The aim is to establish a comparable basis across EU countries and identify those countries facing the most severe situations in terms of financing challenges. In these countries, investment needs, financing strategies and options for closing the financing gap are the focus of further analysis.

Drivers of investment needs

8. In an earlier OECD study (OECD, 2005), Ashley and Cashman projected water-related investment needs as a share of GDP, acknowledging economic growth as a major driver for water-related investment needs. The current project builds on this earlier OECD work and expands the range of drivers beyond economic growth to reflect the situation in EU member states. The most significant drivers of investment needs have been identified as follows:

- Water supply
  - Urbanisation (including the number of additional people to be connected to water supply systems)
  - Compliance with the Drinking Water Directive
  - The number of people from vulnerable groups who do not have access
  - Additional investment to approximate the best performance in terms of the efficiency of water networks (minimising non-revenue water or resource losses).
- Sanitation
  - Urbanisation (and the number of additional people to be connected to sanitation systems)
  - Compliance with the Urban Wastewater Treatment Directive
- Flood protection
  - The value of assets at risk of flooding.

9. Compliance with the Drinking Water, Urban Wastewater Treatment and Flood Directives does not guarantee compliance with the Water Framework Directive. Compliance with the latter will depend on drivers such as the reduction of nitrates and diffuse pollution from urban or agriculture runoff. It will also depend on the re-

naturalisation of rivers and lakes, and clean-up of historic contamination. Member states are required to consider and implement a range of measures to comply with the Water Framework Directive. The cost of such measures is not known with accuracy, nor in a way that allows for cross-country comparisons. Therefore, the additional cost of complying with the Water Framework Directive could only be discussed qualitatively in the context of this assessment.

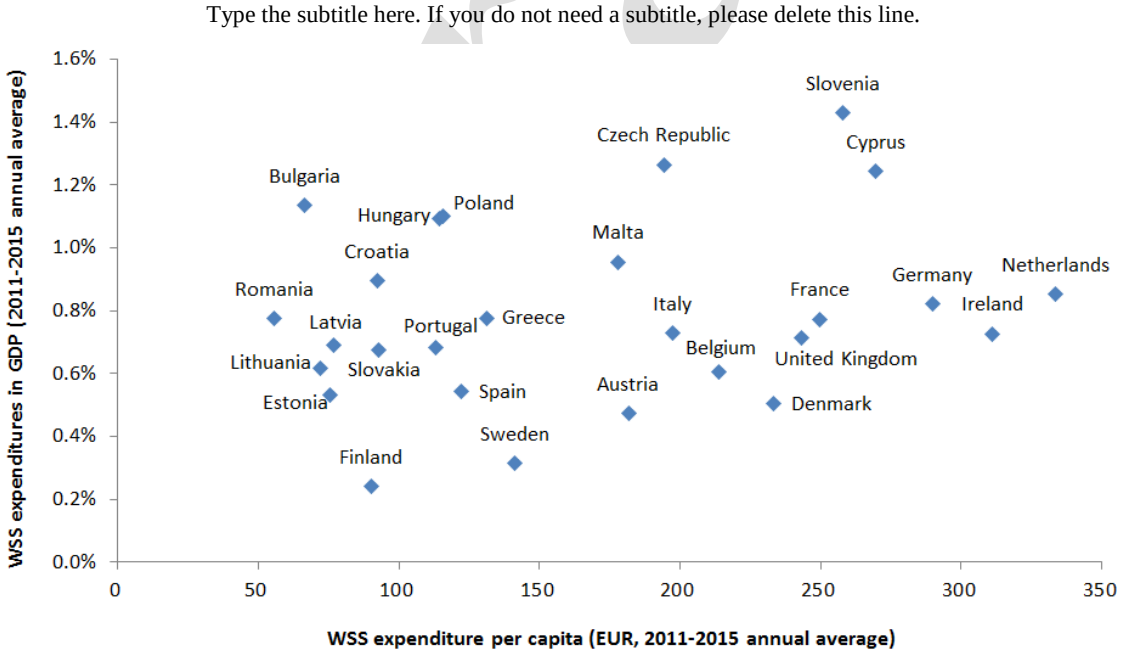
Financing water supply and sanitation

Current levels of expenditures

10. Reference data (annual average for the period 2011-15) were computed based on a range of Eurostat datasets covering various parts of water-related public and household expenditure. Such data made it possible to establish separate baselines of total expenditures for water supply and sanitation respectively.

11. Estimates of annual average total expenditure can be translated per capita, as well as calculated as a share of GDP. Combining these two indicators makes it possible to position countries in terms of macro-level affordability of WSS expenditures (Figure 1). For instance, countries with relatively low level per capita expenditure but already high share of total expenditures in GDP are very likely to be in a more challenging position than countries at the other end of the spectrum.

Figure 1. Estimated expenditures on water supply and sanitation per capita and as a % of GDP



Note: Expenditure for Finland, Croatia and Sweden are underestimated due to data limitations.
Source: OECD analysis based on EUROSTAT (WSS-related public and household expenditures, GDP, population).

Sources of finance

12. Estimates of total expenditures in each country were derived from data on current levels of water-related expenditures by the public sector and household respectively. Complementary data sources were then used to estimate the share of total expenditures having relied on EU transfers and debt finance. Recourse to debt typically contributes to financing upfront capital investments where liquidities may be insufficient for on-balance sheet financing and/or when borrowing conditions are particularly attractive. EU transfers and debt are not considered as additional to WSS expenditures but as underlying sources of funding or financing.

Affordability

13. Pricing is a key element to make WSS services financially sustainable. However, affordability concerns, whether perceived or actual, may restrict the ability to use pricing as a way to recover costs. Based on current household expenditure levels, all countries remain below the 3% threshold[2] if considering the lowest quartile and quintile of incomes. In a number of countries, the share of expenditure on water supply and sanitation for the households with the lowest 10% of income (even more so for the lowest 5% of income) tends to be significantly higher (compared to other EU member countries). This typically reflects a significant income inequality.

Financing flood protection

14. The Floods Directive does not specify any particular level of security against flood risks. The acceptable level of risk remains a political decision, to be determined at national or sub-national level. Such decisions can be informed by assessments of exposure to risks and of the costs of protection, now and in the future. Levels of awareness and engagement to manage flood risks vary significantly across EU member states. This reflects levels of exposure and experience with flood risks.

15. In terms of methodology, it was not possible to establish a robust baseline of current expenditures for flood risk management, as flood protection does not correspond to a specific sector or subsector in any international statistical standards/ international classifications. Regarding source of finance for flood risk management, given the unreliability of expenditure data, shares of different sources of finance – including EU funding - should be interpreted with extreme caution.

Projected investment needs: Water supply and sanitation

16. Projections explore three different scenarios:

- Business-as-usual (BAU): These projections reflect the additional cost of connecting new city dwellers: they are driven by urban demographic change. The projections do not take the rate of use of installed capacity into account. This may result in projections being quite accurate for certain countries, such as Ireland (where installed

[2] It is worth noting that, while 3% is used as a proxy for affordability limit, such a threshold is highly debatable and does not build on any robust assessment. The appropriateness of setting such a uniform limit for affordability is challenged by some scholars. See, for examples, work by Hutton, Wittington. See also OECD Working Paper (forthcoming 2018) *The Social Consequences of Pricing Water*, for a discussion.

capacity is fully used in Dublin) but being overestimates of financing needs other countries, such as Germany (where there is sufficient installed capacity to accomodate more city dwellers).

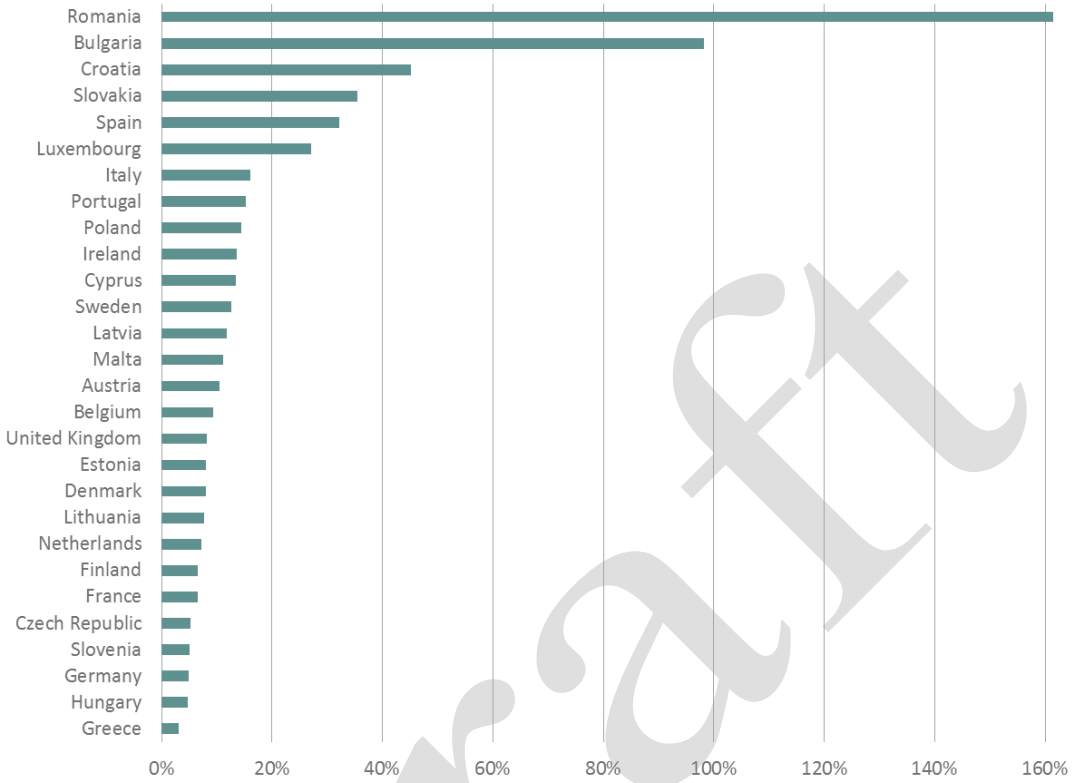
- An alternative scenario for water supply reflects the cost of compliance with the revised DWD and additional efforts to enhance the efficiency of services. The proxy used for the latter is convergence towards a 10% rate of leakage. The scenario includes the cost of connecting vulnerable groups as well, as mandated by the revised DWD.

- An alternative scenario for sanitation captures the additional level of effort required to comply with the UWWTD. The large number of countries for which projected additional expenditures are nil may signal that assessment of distance to compliance with the UWWTD may only be partially accurate. The ranking of projected needs for this scenario does not reflect the EU 15 – 13 categories: Italy, Portugal and Spain still need to invest significantly to comply with the UWWTD. Per capita, Romania and Bulgaria face a distinctively high level of additional expenditures.

17. A telling indicator of the additional level of effort that will be needed in the future can be constructed by calculating the additional required expenditures for water supply and sanitation until 2030 compared with the current level of expenditures. Figure 2 summarises the results of this calculation. It is assumed that each country spreads the additional expenditures evenly over the period.

18. Two countries stand out, which need to at least double the current level of expenditures for water supply and sanitation: Romania and Bulgaria. Four additional countries need to increase the current level of expenditures by 20% or more: Croatia, Luxemburg, Slovakia, Spain.

Figure 2. . Per annum additional expenditures by 2030 (BAU + compliance + efficiency) vs. baseline



Source: OECD analysis based on EUROSTAT (WSS-related public and household expenditures, GDP, population).

1.1. Projected investment needs: Flood protection

19. Projections for investment needs for flood risk management are primarily focussed on riverine floods. Projections reflect the respective impact of climate change and of socio-economic factors, namely economic and demographic growth. These impacts are projected based on three variables: the value of assets at risk of flooding, the number of people affected by floods, and the value of GDP affected by floods.

20. Due to the paucity of data on current level of expenditures for flood protection, the methodology developed focusses on calculating growth factors, rather than quantitative estimates of investment needs. The approach reflects two assumptions:

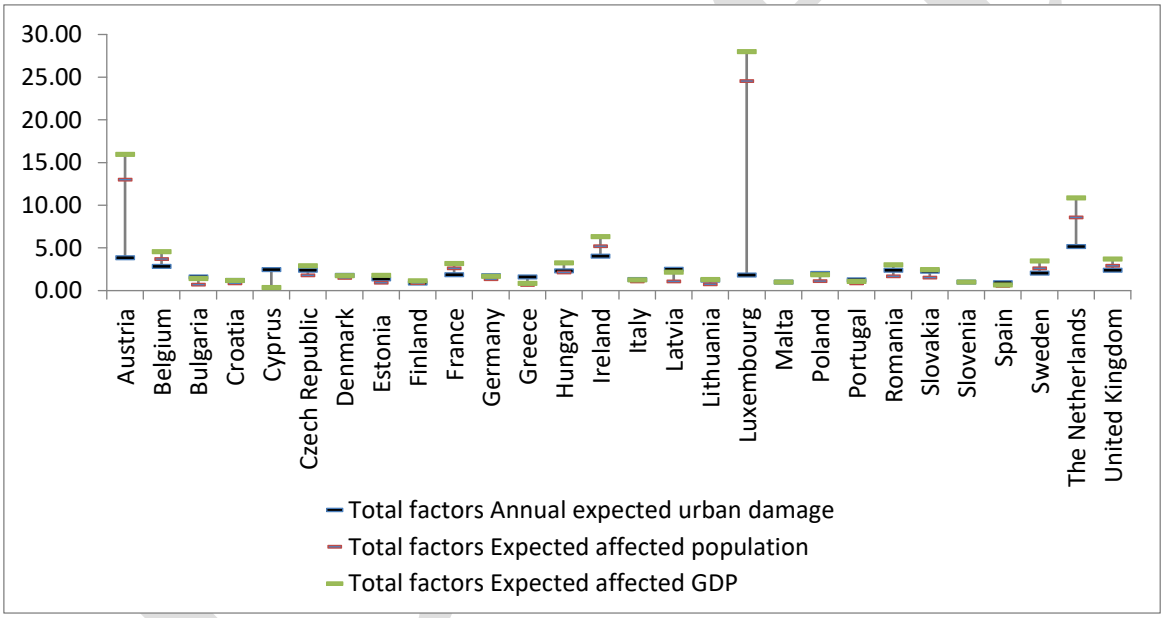
- The appropriate level of security against flood risk will remain stable over the period. This is a strong assumption, as the public opinion may be less willing to accept risks of floods as countries develop and people become more aware of what is at stake.

- The costs of mitigating flood risks rises at the same rate as the share of the population, the value of assets or GDP exposed to floods. This again is a strong assumption. As experience accumulates, countries may favour technologies and flood management approaches and policies which can become significantly more costly (e.g. large dykes) or alternatively invest in approaches and policies that are comparatively less expensive or

can generate multiple benefits (e.g. nature-based solutions). Alternative ways of mitigating floods risks will be discussed in the final part of the full report on this project (forthcoming).

21. Figure 3 summarises the total growth factors for river flood risk expenditure by 2030. The results of the assessment show that the total growth factors for Austria, Luxembourg, and the Netherlands are the highest compared to other member states. These countries will face the largest increases in flood risk expenditures by 2030, if they aim to maintain at least current flood protection standards. The increase in total growth factors is mainly driven by climate change, indicating that urban assets, GDP and population will be increasingly exposed to flooding in the future compared to the current situation.

Figure 3. Total growth factors for river flood risk expenditure by 2030



Note: A growth factor is defined as the factor by which current flood risk expenditures should be multiplied in order to maintain current flood risk protection standards in the future (by 2030).
Source: Acteon, for this project, based on WRI projects.

The capacity to finance projected investment needs across member states

22. The approach taken to assess countries' financing capacities in this study considered three sets of complementary indicators summarised in Table 1, thereby highlighting possible room for manoeuvre and constraints.[3]

[3] Options to minimise financing needs and to harness additional sources of finance are discussed separately in the final report.

Table 1. Summary table of indicators of financing capacities

	Relevance	Data type	Data source	Coverage	Geography
Country-level average water price	Supply and Sanitation	-	*Unavailable*	-	National
Water as % of expenditures for low income households	Supply and Sanitation	Authors' estimates	Based on Eurostat data		
Tax revenue as % of GDP	Supply, Sanitation and Flood	Official	Eurostat	Comprehensive	Europe
Government consolidated debt as % of GDP	Supply, Sanitation and Flood	Official	Eurostat	Comprehensive	Europe
Sovereign rating	Supply, Sanitation and Flood	Third party	Standards & Poor's	Comprehensive	Global
Domestic credit to private sector as % of GDP	Supply and Sanitation	Third party	World Bank	Comprehensive	Global

23. Ability to price water: In most countries, affordability concerns constrain a progressive move towards full cost recovery. To try to assess whether these concerns are perceived or actual, the impact of passing on the total cost of WSS expenditures to households (in this case for the disposable household income of the lowest decile of household income) was simulated. This is based on current total expenditure levels, as well as compared with the current share of WSS expenditures in households' disposable income.

24. Increasing public spending: It is assumed that public spending for WSS may be increased based on either taxes or borrowing. A high percentage of taxes in GDP may both highlight a country's demonstrated ability to use taxation as an instrument to finance public expenditures as well as indicate a constraint to further increase taxes moving forward (and conversely for countries with a currently low percentage). A high percentage of public debt may, depending on its level, indicate a possible or likely budgetary constraint, which could prevent the country from increasing public spending and from borrowing at a reasonable cost.

25. Ability to access private finance: Some member states have been partly relying on debt financing to finance (mainly) upfront capital investments. Domestic credit to private sector as a percentage of GDP (an indicator monitored by the World Bank) can provide a general indication of each country's ability to tap into domestic commercial debt financing. A relatively high percentage may indicate that commercial debt is readily available in the country for financially sustainable WSS projects (and vice versa).

Preliminary conclusions

26. The analyses described in this background note allow for the characterisation of challenges faced by EU members states to finance projected investment needs for water supply and sanitation. Because expenditure needs to protect against flood risk could not be monetised, a different approach using growth factors has been used.

27. In terms of cross-country comparisons, a few preliminary messages can be drawn from the analysis so far. This characterisation is provisory only. It aims to identify countries that face the most severe challenges. The situation in these countries and options to address the challenges will be considered in more detail in the second phase of the project.

- Romania and Bulgaria face the most severe financing challenges. The projected additional level of effort needed for future investment is very high and room for manoeuvre to increase financing appears limited.

- Croatia and Slovakia face different challenges. Slovakia seems to have comparatively more options to scale up financing, as the current level of effort represents a smaller part of GDP.

- Spain and Luxemburg need to significantly increase current levels of spending, which is comparatively low in Spain. Luxemburg has room to manoeuvre to scale up financing for the three dimensions monitored here (tariffs, public spending or private debt).

- Italy and Portugal are in a similar situation as regards current and projected levels of effort. However, Portugal does not have the same capacities to increase spending for water supply and sanitation.

- Poland, Ireland, Cyprus, Sweden and Latvia are projected to increase their levels of spending by 13 or 14%, but with varying degrees of room for manoeuvre in terms of scaling up financing. In Sweden, the current level of effort represents 3% of GDP and there are options to increase tariffs, public spending and access commercial debt. Poland is in a different situation, as the current level of effort represents 1.1% of GDP and affordability issues are already severe.

- It is not clear how Latvia and Lithuania can cover the projected increase in spending for water supply and sanitation. Apart for public sending, room of manoeuvre seems limited. The same applies for Hungary and Greece, although the additional level of effort is projected to be limited.