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Economic and financial aspects of the sanitation challenge: A practitioner approach

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ABSTRACT

This paper examines some economic and financial aspects of the sanitation challenge. It first reviews studies on the economic benefits of sanitation and compares it with an analysis of the average economic rate of returns of financed sanitation projects. It then discusses why sanitation projects are usually not financially viable and the importance of financial sustainability. The paper concludes that the real financial challenge of universal access to basic sanitation resides more in the lack of financial sustainability at the sector level than in the total investment required to reach the target.

1. Introduction

Along with drinkable water, sanitation is probably the most essential and vital service. Yet 2.4 billion people still lacked access to improved sanitation in the world in 2015 (WHO) leading to environmental contamination and epidemic diseases. Although the gap has been significantly narrowed since the 1990s, with an increase in access from 54 percent in 1990 to 68 percent in 2015 (Hutton and Chase, 2017, pp. 174 sq.), the challenge remains impressive. Meeting the target of universal access to sanitation as defined by the Sustainable Development Goals[2] requires tremendous investments in the coming decades.

In this context, the objective of this paper is to review the economic and financial aspects of the sanitation challenge, with some emphasis on the latter. The paper is divided into three main parts.

The first part of the paper reviews the societal challenge of providing access to sanitation, and how it translates into a financial challenge. Putting investment needs in perspective shows that universal access to sanitation is less unachievable than some might think.

The second part of the paper deals with economic aspects of sanitation. While international macro-economic studies agree that sanitation is a very beneficial investment for society at the global and national level, the review of economic rate of returns of actual sanitation projects show surprisingly relatively low rates and more surprisingly lower rates than in other sectors. In other terms, sanitation projects financed would not be the most beneficial one, and by far when compared to some other services such as energy … or communication services. A potential explanation for this unexpected result would lie with the problem of financial sustainability faced by many potentially very beneficial sanitation projects, particularly when the societal impact is taken on board.

The third part of the paper focuses on financial aspects of sanitation. It discusses why financing sanitation projects is often given a lower priority by governments and why these projects are usually not financially viable. The importance of financial sustainability is then discussed, followed by a brief presentation of the most adapted sources of finance and their characteristics.

The paper concludes that the real financial challenge of universal access to basic sanitation resides more in the lack of financial sustainability at the sector level rather than in the total investment required to reach the target. Financial sustainability, particularly for the traditional form of a centralized sanitation and wastewater grid, is the most critical issue for the sanitation sector as it constrains the financing of highly beneficial projects for society. All efforts should therefore be focused on increasing the financial viability of sanitation projects mostly by acting on citizens' willingness to pay for the service, and by helping local governments to take action while taking into account affordability.

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[2] SDGs define universal access as « the percentage of population using safely managed sanitation services. »

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Table 1
Total population to serve from 2015 to 2030 to reach universal access to basic sanitation services (million).
Source: Hutton (2015).

Region	Urban	Rural	Total
Latin America and the Caribbean	127	35	161
Sub-Saharan Africa	431	586	1017
Northern Africa	35	14	49
Western Asia	41	17	58
Caucasus and Central Asia	9	5	14
South Asia	389	765	1155
South-East Asia	136	95	230
Eastern Asia	277	3	280
Oceania	0	1	1
Developed countries	3	2	5
World	1448	1523	2971

2. A societal and financial challenge

Achieving universal access to basic sanitation at home represents both societal and financial challenge. In 2015, about one third of the world population still did not have access to improved sanitation services (United Nation, 2017a). The total population to serve from 2015 to 2030 to reach universal access to basic sanitation services is estimated at 3 billion with over 1 billion of the unserved residing in each of sub-Saharan Africa and South Asia (Hutton, 2015) (see Table 1).

Poor sanitation has dramatic consequences for human beings. It is linked to transmission of diseases such as cholera, diarrhea, dysentery, hepatitis A, typhoid and polio. Diseases associated with poor water, sanitation and hygiene (WASH) conditions comprise 6–7% of mortality in less developed countries (Jeuland et al., 2013) and remain one of the major contributors to the environmental burden of disease worldwide. Inadequate sanitation is estimated to cause 280 000 diarrheal deaths annually (WHO, 2017) and is a major factor in several neglected tropical diseases, including intestinal worms, schistosomiasis, and trachoma. Poor WASH condition is estimated to kill on average daily 3900 children, among which about half are under 5 years old, and essentially concentrated in Africa and Asia (UNDP, 2006).

Achieving universal access to basic sanitation represents also a financial challenge. Annual investments needed to meet and sustain universal access to basic sanitation services by 2030 is estimated between US$ 28 billion and US$ 33 billion, at 5% and 3% discount rates, respectively (Hutton, 2015).[3] While this investment is of course significant, this number has to be put in perspective: when compared to global economy it represents “only” about 0.10% of low and middle income countries’ total GDP. Hence, put in perspective the financial challenge of universal access to sanitation does not seem to be unachievable. A central question then becomes: why is it so challenging?.

3. Economic aspects of sanitation

One paradox of the sanitation sector is that acknowledged advantages of universal access at the aggregate level do not seem to translate into expected investment and returns at the micro level.

3.1. A beneficial investment at national and global levels

Studies are regularly conducted by international organisations (WHO, World Bank, WSP) on the economic benefits and cost of sanitation to society at the global and national level. The case is often made in these studies that the economic benefits of water and sanitation investments exceed the costs by some amount or multiple.

[3] This estimate varies from one organization to another, but remains in that order of magnitude.

The lack of access to improved sanitation is estimated to have a very significant impact on the economy of developing countries and costs countries several percent of their GDP annually, due to health problems, absenteeism, limited access to the labor market particularly for women, etc. (Hutton, 2011). A survey of 18 African countries showed that the annual economic losses due to poor sanitation are equivalent to between 1% and 2.5% of GDP. However, this percentage can be even higher in some countries. For example, in Pakistan, India and Cambodia, the annual economic losses represent 6.3%, 6.4% and 7.2% of GDP respectively.

Investing in sanitation is economically extremely beneficial at the country and global level. It leads in particular to four main economic benefits (Hutton, 2012):

- Savings related to seeking less health care. The costs of treating diarrheal disease drain both national budgets and family finances. In Sub-Saharan Africa, for example, half the hospital beds are occupied by people afflicted with faecal-borne disease. Treating preventable infectious diarrhoea consumes 12 percent of the total health budget (UN Water, 2008).
- Savings related to productive time losses from disease. Many workdays are lost to diarrhoeal disease – days lost when the worker is ill as well as when she or he is caring for a sick child.
- Savings related to reductions in premature mortality. Beyond the dramatic human issue which is not easy to quantify in economic terms, mortality can be valued using the human capital approach by estimating the total present value of future earnings of productive adults.
- Time savings due to closer physical access and less waiting time. People without toilets at home spend a great deal of time each day queuing up for public toilets. The World Health Organization estimates that 30 min per person per day would be lost this way, amounting to 1000 h per households per year (UN Water, 2008).

Notwithstanding the heterogeneity of savings thus listed, compiling expected gains from adequate sanitation at the global level, it is estimated that the benefits of universal access to basic sanitation vary from US$ 80 billion to US$ 90 billion per year depending on discount rate and Disability-Adjusted Life Year (DALY) hypothesis. Considering the annual cost of providing basic sanitation of US$ 28 billion to US$ 33 billion mentioned previously, the Benefit Cost Ratio of providing basic sanitation is estimated between 2.9 and 3.3 (Hutton, 2015).

Economic returns vary between urban and rural areas and between different regions of the world due to different price levels of sanitation services, thus determining different capacity to benefit (see Table 2). In urban areas, the benefit-cost ratio for basic sanitation varies across regions between 1.2 (sub-Saharan Africa) to 5.7 (Oceania), with a global ratio of 2.5. In rural areas, the benefit-cost ratio for basic sanitation varies between regions 3.8 (sub-Saharan Africa) to 47 (Oceania), with a global ratio of 5.2.

Table 2
Benefit-cost ratios for basic sanitation in urban and rural areas by region.
Source: Hutton (2015).

Region	Urban	Rural
Latin America and the Caribbean	3.3	8.1
Sub-Saharan Africa	1.2	3.8
Northern Africa	2.2	5.8
Western Asia	3	7.3
Caucasus and Central Asia	3.3	19.9
South Asia	2.9	5.5
South-East Asia	2.5	17.8
Eastern Asia	4	12.9
Oceania	5.7	47.2
Developed countries	3.5	33.4
World	2.5	5.2