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Every drop counts

Assessing aid for water and sanitation

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Abstract

Water and sanitation sectors have been the 'natural' subjects of aid for several decades. However, these sectors also were among those most affected by changes in aid approaches and tools. The aim of this paper is to capture some of the complexity in assessing impact and effectiveness of aid in water and sanitation sector. Notwithstanding this complexity, the paper aims to explore some of the key factors that influence successful and effective use of aid. Though the overall magnitude of aid to water supply and sanitation activities has increased significantly, it is not easy to connect aid with specific outcomes such as reduction …/

Keywords: water supply, sanitation, health, aid, effectiveness
JEL classification: H87, N50, O18, Q53, Q25

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… on mortality due to waterborne diseases or number of people with improved access. Though water supply and sanitation sector attracts about 7.4 billion dollars of aid this is perhaps smaller than what is needed to achieve the Millennium Development Goal sanitation target let alone fully realizing the human right to water and sanitation. The paper discusses some key challenges in making aid in water supply and sanitation more effective. Donors need to be aware of the 'accountability paradox' by which a demand for greater accountability can push investments away from much needed but difficult to measure institutional reforms towards easily measurable but perhaps somewhat less effective physical infrastructure. As the 'low hanging fruit' have been taken, making further progress may require the development of appropriate tools so that aid is used more often in effectively catalysing a range of institutions in finding solutions and less in terms of directly investing in delivery of services.

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1 Introduction

How much aid is given to water and sanitation services? How much do we know about what works and what does not with regard to aid in this sector? What is the rationale for continuing to fund water and sanitation services? What have we learned from the experiences so far? Are there any inherent biases and paradoxes? How can we use this learning to make future aid funding more effective? What should we be doing differently? These are important questions for donors and those engaged in delivering water and sanitation services. This paper is an attempt to respond to these questions. We may not be able to provide definitive answers to these questions entirely. However, the aim is that the discussion in this paper helps in thinking about these questions. This paper complements other studies such as OECD (2012).

2 Why water and sanitation matters

Experts in a given field tend to justify why their field is important. Archaeological remnants of the cities of Indus valley civilisation and the Roman empire's aqueducts remind us that finding a good solution to drinking water supply and sanitation problems must play a part of development and flourishing in any society.

The aim of overseas development assistance (or in short aid) is purportedly to make a difference to the lives of the poor households and vulnerable people. Aid to water and sanitation sector (hereafter Wat-san or WSS) has always been a significant component of aid for various reasons. Wat-san improvements contribute directly to saving lives of infants, children and pregnant mothers (UNICEF/WHO 2009; Spears 2012; Cheng et al. 2012). Second, in many cases they contribute to improving the quality of life especially with regard to 'life with dignity' (as recognized in UN General Assembly resolution 64/292 of 2010 on the human right to water and sanitation). Lack of access to water exaggerates gender inequality (Inter-Agency Task Force on Gender and Water 2006; WaterAid n.d.). Third, the technology involved is often readily available and in many cases easily replicable. Fourth, Wat-san improvements generate significant direct benefits to the users but also produce significant positive externalities in terms of improved school attendance and educational performance, and improved productivity for workers (Hutton and Haller 2004; Rijsberman and Zwane 2012). Given all these benefits, the question is not that donors spent any amount of aid on Wat-san but what stopped them from spending even more rather than less—given that nearly 780 million people still do not have access to improved sources of water and nearly 2.5 billion people lack access to improved sanitation (UNICEF/WHO 2012). The good news that drinking water target of Millennium Development Goal 7 has been achieved in 2012 three years before the target date of 2015 was not entirely good news for aid. This is because the biggest contributors to global drinking water target achievement were China, India and other countries in East Asia where aid played only a small part. Thus, on the one hand there is a lot of unfinished business with regard to improving access to water and sanitation and every dollar spent on these services will generate several orders of magnitude in benefits yet progress appears to be slow where it is most needed. The metaphor in the title of the paper was chosen to emphasize the preciousness of access to water as a means to health and well-being and also of the need to make every dollar of aid effective.

Though in many respects the issue of supplying water and removing waste is simple enough, our own understanding of the issues improves with technology and new evidence. Let us take

the case of cholera. The direct connection between health and water and sanitation was clearly established by physician John Snow in 1854 investigating the cause of cholera outbreak in London's Soho district (Snow 2008). By the end of the nineteenth century the importance of clean water supply to fight water-borne diseases especially cholera became standard fare of epidemiology textbooks with the case of Calcutta water supply. The number of deaths from cholera in Calcutta decreased from around 5,000 in 1865 to less than 800 after the introduction of filtered water supply in 1870 (anon. 1899). A number of articles published in *The Lancet* between 1872 and 1899 referred to this as the 'great sanitation victory'. Notwithstanding these early achievements, Calcutta and many cities in the developing world continue to face many epidemiological risks due to a substantial number of households lacking access to improved sources of water and sanitation to avert faecal-oral contamination. Almost a hundred years later, as the flow of refugees during the Bangladesh liberation war in 1971 triggered another sanitation crisis, another innovation, namely Oral Rehydration Therapy (ORT) was popularized and mortality from cholera decreased from 30 per cent to less than 1 per cent in a period of 8 weeks (Levine 2007; Fontaine et al. 2007).

One of the papers in the most recent Global Burden of Disease 2010 (GBD2010) study published in December 2012 noted that the number of deaths attributable to unimproved water and sanitation decreased from 715,873 in 1990 to 337,416 in 2010 (Lim et al. 2012: 2238). Even if some of this reduction can be attributed to aid, that would seem like a success. However, it is almost impossible to make a direct connection between aid provided for water and sanitation and reduction in number of deaths for two different kinds of reasons.

One set of reasons relate to paucity of data at aggregate level on water and sanitation sector to give us the confidence to make a link between aid and mortality reduction statistics. As Tierney et al. (2011) noted data on aid activities as reported in official sources cover only a small section of all international financial flows to water and sanitation sector. For example, data from the OECD-DAC Creditor Reporting System (CRS) includes data from 22 DAC members and international organizations on grants and concessional loans. Many new donors and non-DAC members also provide significant amount of concessional flows to developing countries; South-South co-operation and financial flows have become significant while it is often difficult to estimate the volume of flows from the emerging economies such as China, Brazil and India. Though new data-sets such as AidData 2.0 aim to increase the extent of data coverage, the issue still remains valid.

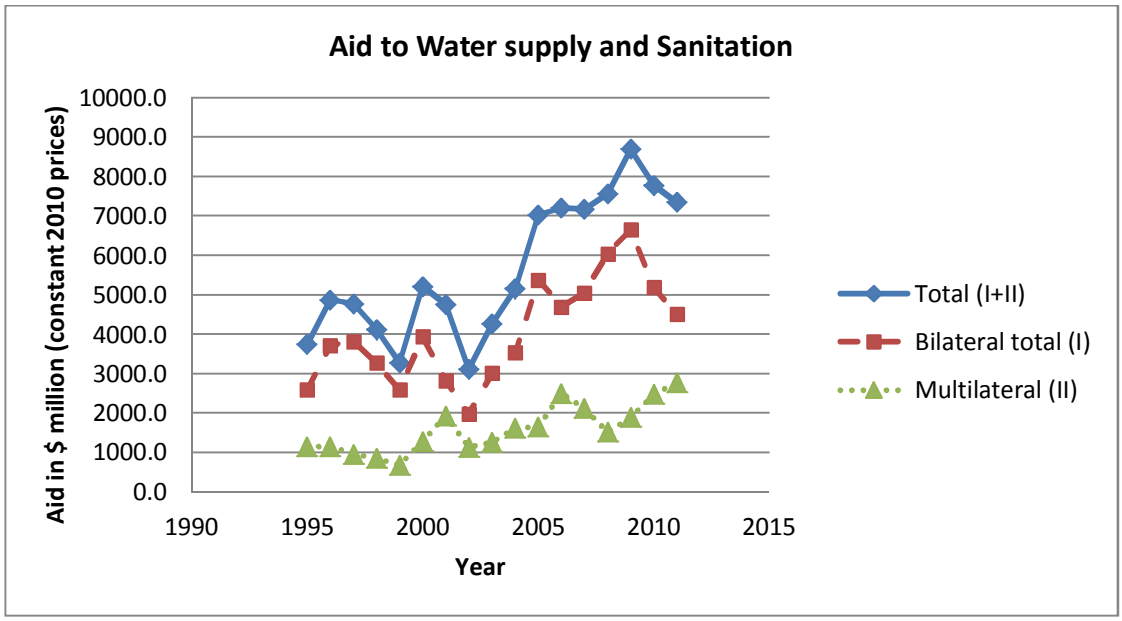
Another set of arguments relates to that fact that water and sanitation improvements may form only a small part of an overall set of factors to explain reduction in mortality or disease burden. Other factors include the Preston-curve or the income effect (i.e., mortality reduction is associated with increase in income per capita of which improved access to water and sanitation may be a mere manifestation); impact of education (as more people become aware of diarrheal disease and how to avoid it); improved access to information and communication (such as access to mobile phones); targeted activities of international and local NGOs and so on. More importantly, evidence from various studies suggests that cholera outbreaks as in the Bay of Bengal region may be linked to warming of oceans and sea surface temperature which triggers a bloom of phytoplankton which in turn triggers zooplankton which harbour the pathogenic *vibrio cholerae* that cause cholera (Colwell et al. 2003; de Magny and Colwell 2009; Jutla et al. 2011).

Notwithstanding these difficulties, donors are devoting energies to assess aid to water and sanitation more regularly.

3 How much aid is given to water and sanitation sector?

An assessment of aid given to water and sanitation sector is not as straight forward as it might seem. From the CRS database we can get some idea of the amount and share of aid to water supply and sanitation activities. Aid to the water supply and sanitation (WSS) sector increased from US$3.7 billion in 1995 to US$7.4 billion in 2011 (constant 2010 prices). Bilateral aid increased from US$2.6 billion in 1995 to US$4.5 billion 2011 whereas multilateral aid to this sector has increased from US$1.1 billion in 1995 to nearly US$2.8 billion in 2011. (See Appendix Table A1 for further details.)

Figure 1: Aid to water supply and sanitation – in US$ million (constant prices)



Source: Based on OECD-CRS data.

However, CRS data does not give a full picture because commitments may not reflect actual flows and CRS database may not include all activities. Also, water supply and sanitation are often included as components of larger projects such as urban development or agriculture and rural development projects which may not be reflected in the figures used here.

According to OECD (2012), in 2009-10, out of all sector-allocable aid, commitment to water and sanitation sector amounted to US$8.3 billion or around 7 per cent. That study notes that in absolute terms, aid to water and sanitation sectors increased from around US$1.5 billion in the 1970s to around US$3 billion in 1980s and remained at around US$4 billion throughout the 1990s before increasing sharply after 2001 to reach US$6 billion by 2005. In relative terms share of water and sanitation in total sector allocable aid steadily increased from around 4 per cent in the 1970s to nearly 7.5 per cent in 1994 but subsequently this share decreased to 6 per cent in 1999 before rising again after 2001 to reach the 7 per cent level now.

Our estimate based on the figures (from tables 1, 2 and 19) DAC statistics suggest that in 2010-11 also the absolute amount stayed the same at around US$8.8 billion (current prices) but relatively this share in total ODA declined slightly to 6.6 per cent. However, when we split it between bilateral and multilateral, only 4.6 per cent of total DAC bilateral aid (of

US$94 billion) goes to water and sanitation whereas nearly 11.4 per cent of total multilateral aid (of US$39 billion) goes to this sector. As a result, nearly US$4.5 billion or slightly over a half of the US$8.8 billion comes actually from multilateral institutions.

The OECD (2012) study noted that the 5 biggest donors to this sector in 2009-10 were (bilateral donors) Japan, Germany, France and institutional donors IDA and EU institutions. Together they accounted for nearly 60 per cent of all aid to water and sanitation sector. This picture remains more or less the same in 2010-11 also (Table 1 below). In absolute terms, Japan and Germany together provide over US$2 billion to this sector. The top 5 donors (Japan, Germany, USA, France, and Switzerland) together accounted for over 60 per cent of all aid to water and sanitation sector in 2010-11. In relative terms, water and sanitation sector gets more than 10 per cent of all aid from Japan, Switzerland, Korea, and Finland.

Table 1: Aid to water and sanitation sector from DAC donors in 2010-11

	Total aid in 2010-11 US$ million	Share of water and sanitation in total aid by the donor, %	Aid to water and sanitation in 2010-11 US$ million	Share of total aid to water and sanitation sector, %
Japan	10 831	10.9	1180.6	21.6
Germany	14 093	8.3	1172.1	21.5
United States	30 924	1.6	482.3	8.8
France	12 997	3.4	436.2	8.0
Switzerland	3 076	12.2	374.6	6.9
United Kingdom	13 832	1.9	267.5	4.9
Australia	4 983	5.3	266.4	4.9
Spain	4 173	5.8	243.9	4.5
Netherlands	6 344	3.2	204.1	3.7
Finland	1 406	10.3	145.4	2.7
Korea	1 328	10.6	140.5	2.6
Denmark	2 931	4.2	121.7	2.2
Sweden	5 603	1.8	101.9	1.9
Belgium	2 807	3.6	101.7	1.9
Canada	5 457	1.0	57.3	1.0
Austria	1 111	4.9	54.7	1.0
Luxembourg	409	7.7	31.4	0.6
Italy	4 326	0.7	30.1	0.6
Norway	4 934	0.5	23.4	0.4
Ireland	914	1.8	16.2	0.3
New Zealand	424	1.8	7.5	0.1
Portugal	708	0.1	0.9	0.0
Greece	425	0.0	0.0	0.0
	134038.3		5460.2	

Note: Column 3 is likely to under-estimate aid to water and sanitation as it does not include aid allocated through multilateral institutions.

Source: Based on data from DAC Statistics (updated on 20 December 2012).

If we consider financing water supply and sanitation were a market, there is something of an 'oligopoly' with some 'loyal fans' and some occasional 'foot-dippers'. A bulk of bilateral aid to this sector came from a few donors. The combined share of top six donors has been over 70 per cent in every year between 1995 and 2011. (See Table A2 in the appendix). In fact, in

some years, the share of top six donors to this sector reached up to 90 per cent of aid to WSS. Japan, Germany, USA, France, and the Netherlands appear frequently in the top six lists for most years in this period. It appears that some donors specialize in WSS while some try it out occasionally with significantly large volume of resources such that they make it into the top six in that particular year but may not appear again in such list for several years.

Table 2: Six biggest bilateral donors to WSS

	Six biggest donors and their combined share in aid to WSS, %						
1995	80.4	Japan	Germany	France	Netherlands	USA	Sweden
1996	83.5	Japan	France	Germany	USA	Netherlands	UK
1997	89.7	Japan	Germany	USA	France	Netherlands	Denmark
1998	84.1	Japan	Germany	USA	France	Netherlands	UK
1999	79.2	Japan	Germany	France	USA	UK	Denmark
2000	82.8	Japan	Germany	UK	France	USA	Spain
2001	80.3	Japan	USA	Germany	Netherlands	UK	France
2002	71.7	Japan	Germany	France	Netherlands	USA	UK
2003	77.2	Japan	Germany	France	Netherlands	USA	Spain
2004	87.0	USA	Japan	Germany	Denmark	France	Netherlands
2005	85.9	Japan	USA	Germany	Netherlands	Sweden	France
2006	84.7	Japan	USA	Germany	Netherlands	France	Denmark
2007	87.7	Japan	Germany	USA	France	Netherlands	UK
2008	79.7	Japan	Germany	USA	Spain	Netherlands	France
2009	85.7	Japan	Germany	France	USA	Spain	UK
2010	81.0	Japan	Germany	France	USA	Spain	Korea
2011	80.5	Japan	Germany	USA	Switzerland	Australia	Korea

Source: Author's analysis based on OECD-CRS (Appendix Table A2).

During the last ten years, even as the volume of aid financing of climate change adaptation and mitigation projects increased, some of this funding would include WSS interventions. According to OECD-CRS data, aid activities with either principal or significant contribution to climate change mitigation and adaptation objectives increased from around US$2 billion in 2002 to over US$15 billion by 2011 (both figures in constant 2010 prices—see Figure A1 in the Appendix). According to OECD (2012), approximately 17 per cent of all aid for mitigation activities and 32 per cent of aid for adaptation activities is spent on WSS activities.

The OECD (2012) study reminds us that though there has been a significant increase in the amount of aid allocated to water and sanitation since 2001 this is yet smaller than the estimated US$18 billion per annum needed to achieve the water and sanitation target of the Millennium Development Goals in developing countries.

4 What kind of aid?

This question can be answered in two different ways. One is a description of what kind of modalities are presently used in WSS sector and another is to ask what modalities should be used in the future. In this section we answer this question in the former sense. The subsequent sections raise issues related to the question in the latter sense.

OECD (2012) reports that of bilateral aid from OECD DAC donors in 2010-11 to water and sanitation, 76 per cent of aid was through investment projects while only 9 per cent was allocated through sector wide budget support. From OECD-CRS data on different types of aid is only available for two years (Table 3). We find our figures are also in that range: over 80 per cent of all aid in WSS being delivered by project mode. The six biggest donors to WSS all use project and programme investment as the main vehicle for their aid to the WSS sector.

Table 3: Aid modalities in WSS, 2010 and 2011

	2010	2011	2010	2011	2010	2011	2010	2011	2010	2011
	Aid in US$m	Aid in US$m	SBS	SBS	Pool	Pool	Proj	Proj	Tech	Tech
Total aid (I+II)	7780.1	7902.9	7.6%	2.1%	6.1%	6.2%	81.2%	88.3%	5.1%	3.3%
I. DAC countries total	5194.1	4877.0	2.9%	2.3%	9.2%	10.0%	80.4%	82.3%	7.6%	5.3%
Australia	217.8	230.1	13.8%	11.9%	51.6%	47.6%	29.0%	29.9%	5.7%	10.6%
Austria	18.0	26.6	7.4%	10.5%	54.8%	41.6%	16.5%	45.6%	7.9%	2.4%
Belgium	48.9	69.8	...	...	7.2%	6.8%	91.9%	91.6%	0.9%	1.6%
Canada	16.3	45.0	...	1.0%	6.1%	53.7%	52.3%	40.3%	41.6%	4.7%
Denmark	139.4	88.1	...	...	...	26.2%	97.7%	71.2%	2.3%	2.6%
Finland	99.4	122.2	0.2%	0.0%	36.1%	45.4%	63.6%	54.5%	0.1%	0.1%
France	500.9	134.9	...	...	0.3%	...	96.4%	93.4%	3.3%	5.5%
Germany	750.8	1040.7	7.9%	4.7%	15.4%	7.6%	73.7%	86.4%	2.9%	1.3%
Greece	0.2	..	...	...	...	...	100.0%	...	...	...
Ireland	9.9	11.4	...	...	77.3%	64.5%	22.7%	35.5%	...	...
Italy	65.0	21.1	...	...	1.4%	17.1%	87.3%	54.9%	11.4%	28.0%
Japan	1933.3	1692.4	...	...	0.7%	0.9%	99.2%	99.0%	0.1%	0.1%
Korea	283.1	172.1	...	...	...	0.0%	99.6%	99.2%	0.4%	0.8%
Luxembourg	21.1	21.5	...	...	3.8%	...	96.1%	100.0%	0.2%	...
Netherlands	123.1	129.5	...	...	3.5%	4.8%	79.5%	78.3%	17.0%	16.9%
New Zealand	6.1	10.4	...	...	35.3%	...	61.1%	67.8%	3.6%	32.2%
Norway	47.5	17.8	...	...	28.3%	60.5%	68.3%	33.7%	2.9%	4.6%
Portugal	1.0	0.6	...	...	...	...	59.3%	100.0%	40.7%	...
Spain	308.5	155.1	...	19.7%	27.4%	20.0%	72.5%	54.3%	0.1%	5.5%
Sweden	55.0	57.5	21.0%	...	55.6%	60.8%	21.6%	37.9%	0.0%	0.5%
Switzerland	49.6	331.5	...	...	10.1%	16.3%	89.9%	82.9%	...	0.8%
United Kingdom	67.8	35.1	25.1%	...	37.4%	51.6%	35.7%	40.1%	1.8%	8.3%
United States	431.3	463.4	6.6%	...	1.7%	...	23.3%	65.9%	68.4%	34.1%
II. Total Multilateral	2482.3	2960.4	17.9%	1.9%	...	...	82.0%	98.0%	0.1%	0.0%

Note: Aid in dollars million; SBS = sector budget support; Pool = Contribution to pooled programmes and funds; Proj = Project and programme investment; Tech = technical expertise support.

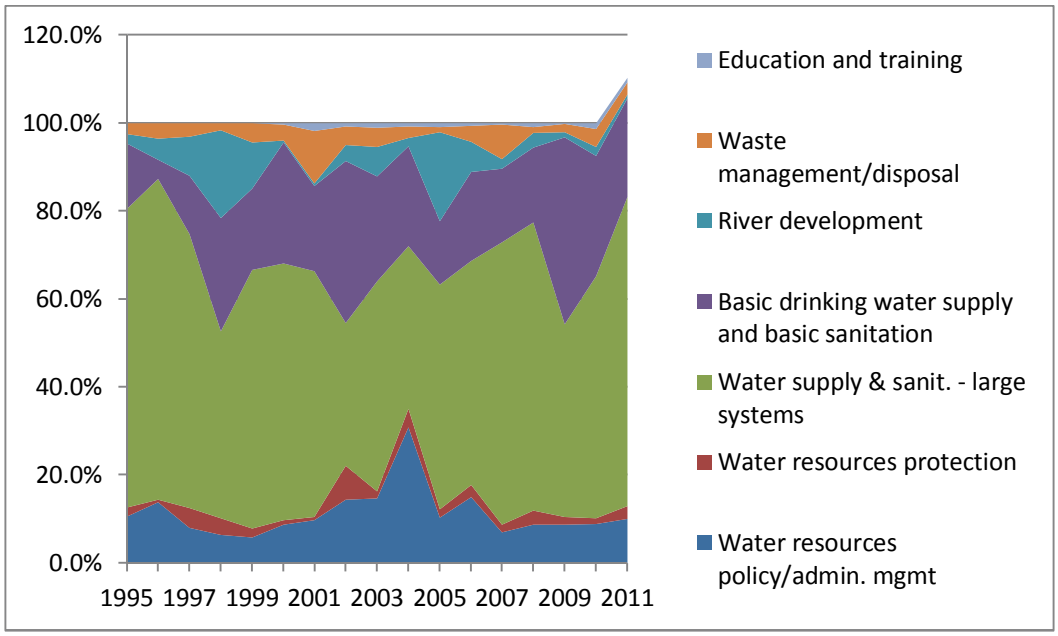
Source: Author's calculation based on data from OECD-CRS.

Sector budget support formed nearly 8 per cent in 2010 but dropped to around 2 per cent in 2011. This is understandable because in many countries water supply and sanitation sectors cut across a range of ministries and sector as well as spatial administrative boundaries. Thus, even though there is a general consensus that water sector policy should be based on integrated water resources management (IWRM), the reality in many countries remains far from this ideal. In such circumstances, projects may be more suitable to deliver direct and measurable benefits in a decentralized manner.

About 6 per cent of all aid to WSS sector is given through core contribution to pooled projects and funds.

In most years, much of OECD DAC donors' bilateral aid goes to water supply and sanitation large systems. The average share of all bilateral aid that went to large systems (CRS code 14020) for 1995-2011 was 55 per cent. In comparison, about 22 per cent of bilateral aid went to basic drinking water supply and sanitation (CRS code 14030) and another 11 per cent went to water resources policy and administration (CRS code 14010).

Figure 2: Which aspects of water supply and sanitation are funded by aid?



Source: Based on data from OECD-CRS.

Does the drive for accountability shift aid programmes away from much needed institutional reforms towards 'hard' infrastructure? Following the commitments by donors to Paris Declaration and increasing emphasis on International Aid Transparency Initiative (IATI), there is pressure on donors to improve transparency of how aid works. In the field of water and sanitation, interventions can fall under two distinct categories—one related to engineering or physical construction and works (i.e., 'hard' infrastructure) and the other related to improving the institutional environment of water governance through better monitoring of water interventions, more transparent pricing mechanisms and subsidies, better performance of water utilities through benchmarking and better mechanisms for stakeholder participation for example through a human right to water (i.e., 'soft' infrastructure). However, there is a 'paradox of accountability' similar to paradigm of masculinity (which suggests that water sector is prone to a bias towards finding solutions that involve 'building', 'constructing', 'erecting' structures and 'diverting' or 'damming' or 'controlling' rivers and water resources as opposed to carefully using what is there or restoring and reviving over-used aquifers or nurturing or 'growing' ecosystems that help revive water resources (Anand 2007: 138): to fully realize the aims of improved accountability it is required a deeper reform of institutions and policies which takes time and often difficult to measure—therefore, increasing emphasis on accountability pushes donors and countries to increase investment in easily measurable things such as physical works. Thus, aid and investment flows away from

the very things needed for sustaining improvements towards perhaps immediately tangible but on the whole less effective or blunt interventions.

A related issue is whether there is bias towards water supply rather than sanitation. Jimenez and Perez-Foguet (2008) in an assessment of ODA data for the years 1995 to 2004 noted that donors favoured aid to water supply than sanitation projects. However, this situation is likely to have changed after 2010 after UN General Assembly resolution 64/292 recognizing access to both water and sanitation as human rights.

The global analysis and assessment of sanitation and drinking water known as GLAAS report (WHO 2012) presents data received from 74 countries. Over 90 per cent of all responding countries reported that targets were in place and more than 70 per cent of the respondents reported that policies have been adopted. However, only 22 per cent of countries reported that in their perception financing was adequate. This proportion was 9 per cent for responding countries from sub-Saharan Africa (SSA). While 56 out of 74 countries have water policies agreed and gazetted (or promulgated) by 2011, only 46 countries have done so for sanitation. However, the delayed start with sanitation seems to have given an advantage when it comes to identifying a lead agency and clearly allocating roles as was done by 61 countries for sanitation as compared to only 41 countries doing this for water sector. It is understandable that water sector can be more cross cutting involving agriculture and industry departments and other institutionalised vested interests making it more difficult to agree a lead agency and allocating roles.

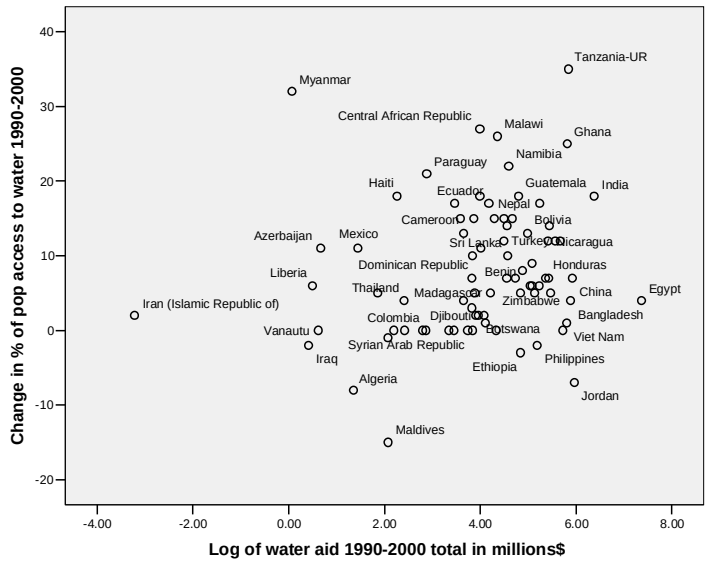
Also, there appears to be 'picking of the low hanging fruit' by donors by allocating more volume of aid for water and sanitation to countries which have been making significant progress in achieving MDG targets. Thus, for example, strong performers on MDGs such as India, Vietnam, Turkey, and China received a significant amount of aid and were amongst top ten recipients of aid in water and sanitation sector in 2009-10 (OECD 2012). That report notes that some countries such as Haiti and Mauritania received little by way of aid for water and sanitation though they have a large proportion of population without access to improved water and sanitation.

5 Is there evidence to suggest that aid to water and sanitation has been effective?

There can be many different ways to measuring effectiveness of aid for water and sanitation. One could be to look at the MDG target 10 i.e., the proportion of people with access to improved water and improved sanitation. According to UNICEF/WHO (2012), the proportion of population in the developing world with access to improved sources of water increased from 70 per cent in 1990 to 86 per cent in 2010. In 1990, 32 per cent of people in the developing world had access to piped water supply while 38 per cent depended on other improved sources. By 2010, those with piped supply increased quite significantly to 46 per cent while those with access to other improved sources increased to 40 per cent. These are global figures and some of the improvement may have occurred without any aid. It is difficult to isolate how much of this increment actually came from aid funded activities.

A previous study based on data from 1990 to 2004 (Anand 2006) suggested that there was no correlation between the volume of aid received and performance in terms of whether the proportion of population with access to water and sanitation improved and if so by a commensurate extent (Figure 3).

Figure 3: Lack of relationship between volume of aid and access to improved sources of water



Source: Anand (2007).

To further examine this relationship, we use an indicator such as the marginal or incremental number of persons provided with access to improved sources of water per dollar of aid. According to WHO-UNICEF (2004) estimates, the proportion of people having access to water increased from 77 per cent in 1990 to 83 per cent in 2002 and the proportion of those with access to sanitation increased from 49 per cent in 1990 to 58 per cent in 2002. As per previous estimates for data from 157 countries, the number of people provided with water and sanitation between 1990-2000 was 991 million and those provided with sanitation was 955.85 million (Anand,2007). During the period of 1990-2000, the total amount of aid to the sector for these countries was estimated to be US$11.14 billion. This gives a figure of 0.17 persons per dollar of aid or approximately US$5.88 to provide access to water or sanitation per person. However, this global average does not fully reflect the variation in the impact of aid from one country to another. To identify the determinants of aid impact or effectiveness of aid, multiple regression analysis is used. A description of the independent variables used is given in Table 4. The regression results are reported in Table 5.

Regression results above seem to suggest that in population size has an influence on how many people benefit from a dollar of aid. This may be because the larger the population the greater may be economies of scale in providing water and sanitation services. The positive relationship between privatization proceeds and aid effectiveness is likely to be picking up the effect of institutional reforms. Countries which had privatized many infrastructure services in the 1990s had introduced many institutional reforms including some degree of financial autonomy and fiscal discipline and this is likely to have contributed to aid working better.

Table 4: Independent variables used in regression analysis

POP	Population in millions (2002) from World Development Indicators	As an indicator of country size.
PRIVATN	Proceeds from privatization of infrastructure during the period 1990-2000 (from the World Bank privatization database)	This is an indicator of (a) the infrastructure policy orientation and (b) whether the windfall incomes would have contributed to government spending on water and sanitation
HEALTH	Public expenditure on health as a per cent of GDP—average for 1998-2000 from the World Development Indicators.	Given the close relationship between water and sanitation improvements and health burden (diarrhoeal diseases) and infant and maternal mortality, this variable if of interest
GINI	Gini coefficient from UNDP Human Development Report 2004	As an indicator of inequality
GDPCAP	GDP per capita 2002 in PPP $ from World Development Indicators	As an indicator of level of per capita income
CPI	Corruption perception index from Transparency International (average for 1995-1999)	As an indicator of quality of governance
AID2GDP	Aid to GDP ratio in 1990 (from World Development Indicators)	As an indicator of aid dependence of a country

Source: Anand (2006).

Another way to measure aid effectiveness is to look at the outcome indicators such as maternal mortality or infant mortality or burden of disease. However, isolating the effect of aid in reducing such outcomes is difficult and would require a lot of good quality data on a number of other variables which could have had an effect in improving health outcomes.

There are four possibilities with regard to whether aid to water and sanitation sector has been effective in relation to ODA in general:

(a) Both ODA in general and aid to water and sanitation sector in particular are effective.

(b) ODA in general has been effective but water and sanitation sector aid has not been effective.

(c) ODA in general has not been effective but water and sanitation sector aid has been effective.

(d) Neither ODA in general nor water and sanitation sector aid have been effective.

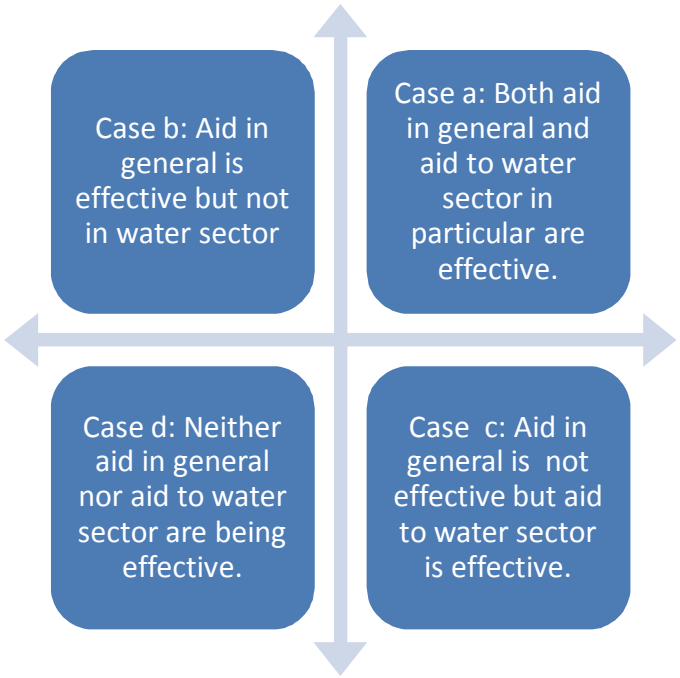
This can be shown pictorially using the four quadrants as in Figure 4.

Table 5: Regression results: aid effectiveness

Dependent variable: Log of incremental population provided with access to water/sanitation per dollar of aid 1990-2000							
	Regression 1	Regression 2	Regression 3	Regression 4	Regression 5	Regression 6	Regression 7
Constant	-5.036*** (-12.218)	-5.712*** (-13.088)	-6.166*** (-10.774)	-15.397*** (-3.804)	-22.378*** (-4.775)	-24.552*** (-4.851)	-2.470 (-0.691)
Population 2002 (log)	0.929*** (7.211)	0.673*** (5.772)	0.725*** (5.871)	0.716*** (5.214)	0.801*** (6.050)	0.744*** (4.589)	
Proceeds from privatization 1990-2002 US$ million (log)		0.231*** (3.164)	0.218*** (2.967)	0.223*** (2.862)	0.072 (0.759)	0.067 (0.643)	0.124 (1.769)
Public expenditure on health as % of GDP (average for 1998-2000) (log)			0.493 (1.216)	-0.063 (-0.132)	-0.397 (-0.854)	-0.643 (-1.147)	-0.614 (-1.563)
Gini coefficient (log)				2.554** (2.331)	2.908*** (2.822)	3.447*** (3.043)	0.595 (0.623)
GDP per capita 2002 (log)					0.797** (2.510)	0.987** (2.448)	
Corruption perception index (average for 1995-1999) (log)						-0.902 (-1.397)	-1.046** (-2.278)
Aid to GDP ratio 1990 (log)							-0.990*** (-8.760)
Adj. R square	0.425	0.610	0.615	0.609	0.661	0.630	0.816
N	69	42	42	39	39	32	28

Source: Anand (2006).

Figure 4: Is water and sanitation sector different (compared to aid in general)?



Source: Author's illustration.

Cases a and d above may have common factors or causes such as the quality (or the lack) of institutions and policies, governance context, rule of law and the nature of civil society (in case a, all of them functioning fairly well and in case d perhaps many of them deficient or weak).

Cases b and c are of particular interest. Case b suggests that while aid has been in general effective, water and sanitation sectors may have organizational capacity constraints or may be stuck in 'low level equilibrium trap' where years of poor quality of service results in water utilities remaining financially insolvent and dependent on state subsidies even to cover operation and maintenance costs leaving little capacity to invest. Case c is a situation where sector reforms in water and sanitation remain ahead of others—due to historical, epidemiological or cultural reasons.

We can illustrate this with a simple analysis. For the purposes of this exercise, let us define overall indicator of aid effectiveness in terms of how much poverty has been reduced between 1995 and 2010:

- dPov = Number of poor persons (less than $2 a day) in 1995 minus number of poor persons in 2010
- ODA= Total aid in contant prices between 1995 and 2010
- Aid effectiveness = dPov/ODA

Similarly, we can define aid effectiveness in water and sanitation sector:

- dWatsan = Incremental number of persons gaining access to improved water or sanitation between 1995 and 2010

- WatsanODA = Total aid to water and sanitation sector in constant prices between 1995 and 2010

- Aid effectiveness in Watsan = dWatsan/ WatsanODA

If both indicators are positive, we have case a; if both are negative we have case d and so on.

Data for this exercise is collected from World Development Indicators and WHO-UNICEF Joint Monitoring Programme. This dataset is shown in the Appendix table A3. Combined data on both these indicators is available for 52 countries. We can now organise them on the lines of Figure 4 shown earlier. The resulting distribution of countries is shown in table 6 below.

Table 6: Aid effectiveness in general and effectiveness of Water and Sanitation sector aid: An illustration

		ODA effectiveness: Reduction in poverty per million dollars of aid	Aid effectiveness in watsan: persons with improved water or san for 1 million $ aid
Case d	Argentina	-264.4	-552.4
Neither aid nor Watsan aid	Venezuela	-444.6	-516.8
are effective	Panama	-7.8	-17.2
	Georgia	-119.9	-3.7
Case c	Nicaragua	-11.2	3.4
Aid in general is not	Bolivia (Plurinational State of)	-69.6	4.3
effective but	Mozambique	-162.9	5.6
Watsan aid is effective	Senegal	-67.3	5.7
	Mauritania	-56.8	6.2
	Zambia	-192.5	7.3
	Niger	-413.8	9.9
	Mali	-220.6	11.6
	Dominican Republic	-157.4	12.3
	Guinea	-147.4	12.8
	Kenya	-853.4	13.1
	Uganda	-347.8	16.3
	Kyrgyzstan	-72.0	20.3
	Côte d'Ivoire	-188.5	23.1
	Madagascar	-596.7	25.4
	Bangladesh	-754.7	27.2
	Ethiopia	-514.4	32.5
	South Africa	-159.0	34.6
	Paraguay	-30.0	45.4
	Uruguay	-85.8	58.3
	Philippines	-478.5	62.2
	India	-4367.1	83.1
	Colombia	-156.2	195.2
	Iran (Islamic Republic of)	-378.4	2260.4

Table 6 continued

Case b: Aid in general is	Belarus	37.9	-601.9
Effective but Watsan aid	Ukraine	1220.3	-429.6
Is not effective.	Tunisia	165.6	-10.1
Case a	Armenia	132.3	0.2
Both aid in general and	Kazakhstan	652.6	0.7
Watsan aid are effective	El Salvador	51.2	5.5
	Sri Lanka	234.2	6.2
	Honduras	10.1	6.7
	Azerbaijan	704.4	6.9
	Peru	205.6	8.0
	Costa Rica	174.8	11.5
	Malaysia	991.5	12.0
	Viet Nam	639.7	13.1
	Cambodia	38.4	19.7
	Turkey	241.6	23.1
	Egypt	91.2	24.6
	Cameroon	93.3	25.7
	Ecuador	131.6	26.8
	Indonesia	951.0	50.4
	Mexico	3450.8	68.9
	Thailand	1781.7	71.6
	Chile	279.5	107.2
	Brazil	2261.9	114.1
	China	12680.3	139.3

Source: Author's calculations based on data from World Development Indicators on poverty (less than US$2 a day) in 1995 and 2010 and aid data from OECD CRS. See Table A3 in appendix.

There are various reasons why Watsan aid might be effective even when aid in general is not effective. Historical factors include inheriting a strong water sector institutions and knowledge base (as for example in the case of irrigation institutions in the Indus river systems in the case of India and Pakistan though many of the original institutions may have been eroded by systems of corruption and contribution to public good problems—as in the case of South India in Wade 1989: 73 suggests). As we have seen earlier, some donors attach more importance to water and sanitation sector—let us call them 'WSS donors'. We can conjecture that case c is likely in a developing country where for historical or geo-political reasons the country has a sufficiently large aid programme by WSS donors. There have been numerous arguments by subject experts as to why water and sanitation sector might be different and why sometimes when aid works in all other sectors it might not work in WSS and vice versa. These usually focus on water being a fungible and fugitive resource with multiple uses and the difficulty of constructing and enforcing property rights and that these alternative uses lead to vastly different drives of valuation by bulk and retail consumers of water. Water institutions have also been historically subject to plural principal-agent relationships (for example, those interested in irrigation and food security vs. those representing human drinking water needs and those representing environment and so on) and correspondingly numerous problems of establishing credible commitments and enforcing contracts.

This kind of analysis can also be useful in choosing aid policy instruments- perhaps project investment approach can be used in all cases; in addition in case a perhaps generalized budget

support can be used because both aid in general and Watsan aid are both effective. In case c perhaps sector budget support targeted to Watsan may be useful. The analysis also suggests why we need to be careful not fall into 'accountability trap' especially in cases b and d.

5.1 Benchmarking and utilities performance

At the moment, it is not yet possible to fully relate aid with water sector performance standards. An international network reporting performance information for WSS utilities in more than 120 countries has been created with support from the World Bank, DFID and other donors. There have been other regional networks providing for comparison of WSS utilities performance but a global database is a recent phenomenon. This database provides mainly data on various indicators to compare performance of different utilities. As yet, the information is not enough to assess aid effectiveness or link performance of utilities with aid received. With more data, it may be possible to test conjectures such as whether better performing utilities receive more aid or use it more effectively than other utilities and eventually pave the way for performance based aid.

5.2 Global funds

The Global Sanitation Fund was established by Water Supply and Sanitation Collaborative Council in 2008 with the aim of targeting additional funds to countries where there is an urgent need. It is based in Geneva and focuses on improving poor people's access to sanitation and hygiene education. As of early 2012, this is being implemented by three Asian countries namely Cambodia, India, Nepal and four African countries namely, Madagascar, Malawi, Senegal and Uganda with the total commitment reaching 43.5 million dollars. The Annual Report (GSF 2012) claims that as a result of this fund, 102,970 persons now have access to improved sanitation with over 68,000 people living in cleaner environments free from defecation (named as 'open defecation free' or ODF communities). Further, in 2012, five more countries Burkina Faso, Ethiopia, Nigeria, Tanzania, and Togo were being included in the programme with a provisional commitment of US$21.5 million. The Medium-Term Strategic Plan of 2012-16 aims to take the total number of countries to 25.

The main contribution of GSF is to develop a collaborative and co-operative approach in each country. The GSF appoints an Executing Agency which will receive the grant; in each country a number of organizations are appointed by the Executing Agency as 'Sub-Grantees' who will implement the programme. Independent evaluators monitor the programme and submit reports directly to the GSF. In many countries, the programme supports Community Led Total Sanitation (CLTS) campaigns in the selected communities or districts. There are two main advantages in GSF approach: a. high level of co-ordination between different donors reduces duplication and administrative costs; b. by building the programme upwards from communities the programme ensures ownership throughout the programme.

The Bill and Melinda Gates Foundation's Global Development Program provided US$667 million of grants in 2011 and includes 'water, sanitation and hygiene' as one of the components. An amount of US$63 million has been given for various initiatives '… to help poor people avoid illness and death by providing and promoting clean water and sanitation facilities as well as healthy hygiene practices in developing countries' (BMGF 2012). One of the initiatives is 'reinvent the toilet challenge' whereby grants have been given to a number of universities and institutions to develop innovative solutions to make human excreta

harmless—these include using solar powered toilet systems, use of microwave energy to develop energy from human waste, extracting water and salts from urine and use some of this water either for flushing purpose or for irrigation.

5.3 Funding for WSS from NGOs

According to OECD DAC statistics, total grants from NGOs increased from around US$7 billion in the year 2000 to over US$30 billion in 2011. Flow of funds from international NGOs to developing countries is quite complex and it is not easy to allocate or break this down by sectors. Specialist NGOs such as WaterAid and Save the Children have had WSS as an important thematic priority; most other NGOs do include some spending on water and sanitation as a minor part of larger programmes. NGOs can be highly effective with regard to improving participation of stakeholders, increasing their awareness and using their participation for improving accountability. All of these are highly relevant to the WSS sector. Though there is some sporadic degree of co-operation between aid funded projects and NGOs, in the future, there is scope for increasing the involvement of NGOs and creating a strategic partnership between ODA funded WSS projects and NGOs especially with regard to implementation of the human right to water, improving the transparency of WSS organizations and making them accountable. Also, NGOs can play a role in capacity building of WSS organizations and in utilizing the water utilities performance benchmarking information to conduct the necessary analysis and inform the public. However, at present there is a problem in that NGOs are often funded by donors because they are sometimes seen as being the 'silver bullet' to deliver aid more directly and effectively to those who need it. Thus, the demand for accountability and effectiveness could be driving aid donors to rely on NGOs which works well in the short-term but this reliance on NGOs keeps the state institutions weak and inefficient. A long-term and sustainable solution is to sort out the institutional arrangements and 'governance deficit' in WSS institutions but the present structure of incentives may be working against this from happening.

6 What are the key challenges in scaling up and replicating successes?

Even as the magnitude of aid going to WSS activities has increased significantly, there has also been considerable change in the nature of activities being financed by aid. However, some things have not changed—a significant share (over 50 per cent) of all aid (bilateral aid by DAC members plus multilateral aid) continues to go towards large water and sanitation systems. In comparison, around 21 per cent of such aid is going to basic water supply and sanitation. This is surprising given that the debate about what constitutes access to improved water sources with regard to MDG targets seemed to suggest that the aim should not be to achieve universal connection to piped water supply (and sanitation) but instead to consider a range of options many involving communal stand posts and other such communal sources. It is not surprising that the proportion of population in the developing world with access to piped water increased from 32 per cent in 1990 to 46 per cent in 2010 while the proportion of population using other improved sources increased only slightly from 38 per cent in 1990 to 40 per cent in 2010 (UNICEF/WHO 2012). Investing in piped supply and sanitation, if affordable, is no doubt a more long-term solution. The question, however, is whether this increased emphasis on piped supply is contributing to exaggerating inequality by channelling resources towards services for the middle class and perhaps urban population while relegating to secondary status basic water supply and sanitation that the urban and rural poor households need. There is an important issue for donors: if they really like long-term solutions then they

may need to finance piped connection which however costs several hundred dollars per household. However, a pro-poor development such as the one based on MDGs and delivering services to the poor households will be more effective in terms of cost per household but may not be a long lasting solution.

Likewise the professionalization and benchmarking of water utilities can definitely contribute to improving financial and operational performance but at the same time this can also make the utilities to focus primarily on revenue generating water (i.e., servicing customers who would be willing to pay) and neglect social obligations of providing water supply to the poor households (who may not be able to afford and do not pay). Aid can play a role in influencing water utilities and in promoting appropriate indicators to distinguish clearly non-revenue water in terms of wastage, leaks and losses from water allocated to equality-enhancing social obligations.

Even as the magnitude and quality of data on aid activities has increased significantly, as yet it remains difficult to assess the effectiveness of aid in water and sanitation sectors. This is because of the difficulty in linking aid activities with actual improvement in outcome variables—especially because WSS interventions while necessary are not sufficient and act in conjunction with a number of environmental variables including quality of institutions, existence of civil society institutions, income, education and access to information.

It may be necessary to develop sector specific indicators to measure aid effectiveness—in the case of WSS health outcomes such as burden of disease statistics, number of days (of work, of schooling) lost due to water borne diseases, direct cost of medication and ORT supplements and indirect costs of chronic malnutrition. Though a remarkable extent of progress has been made in reducing the number of persons without access to improved sources of water supply, the issue of water quality remains important. This is something future aid programmes as well as the indicators to measure its effectiveness will have to address. Previous studies suggest that investing in highly capital intensive water treatment plants does not eliminate the parallel significant investment by households. This can happen in many ways including boiling of water using expensive energy, use of various types of filtering devices including capital intensive but small-scale domestic ultra-violet (UV) ray treatment plants or reverse-osmosis plants or even relying entirely on bottled water for drinking (Anand 2007). Improving the reliability and trust-worthiness of water utility (or water service providers) amongst its consumers is essential before they can begin to enjoy the benefits of expensive water treatment plants. This brings us back to the question of ‘accountability paradox’—and how the paradigm of masculinity that exists in the sector creates a bias in favour of ‘shiny new treatment plant’ over painstaking work of communication and stakeholder engagement that might be needed to build consumer confidence and trust.

Also, consequent to access to water and sanitation being recognized as human rights, it will be necessary to evaluate the extent to which ‘duty-bearer’ institutions have been created or strengthened and to what extent such rights are subject to claims through the court of law. Aid can play a role both directly in investing in institutional strengthening and indirectly by forging a role for NGOs to arbiter in protecting human rights claims.

There is urgent need for thinking outside the box in terms of how to extend water supply and sanitation services to communities that are difficult to reach. The various competitive challenges fostered by Bill and Melinda Gates Foundation may change the way we think

about toilets completely. However, technology is likely to be only a part of any overall solution. Even now many existing simple and low cost technologies seldom reach poor rural communities in SSA and South Asia.

7 Conclusions

In many ways, investing in water and sanitation services is a rather blunt way to reduce infant and child mortality or reduce disease burden associated with diarrhoeal disease. However, historically, as in the Calcutta case of the nineteenth century and the oral rehydration therapy of the twentieth century suggest, improving water and sanitation systems remains an important element of an overall public health improvement strategy.

Nearly US$8 billion of aid has been allocated to this sector in recent years. Most of this is delivered through project and programme aid with sector wide budget support or contribution to pooled programmes and funds forming relatively smaller parts.

Some donors appear to be specialising in this sector. A small number of donors dominate the scene with the six largest contributors to this sector provide more than 80 per cent of all bilateral aid.

For critics, the aid volumes are of no interest given that over 780 million people do not yet have access to improved sources of water and that 2.5 billion people lack access to improved sanitation. We really do not know enough to say what works and what does not in this sector. However, the results from the regression analysis seem to suggest that effectiveness in terms of the number of persons provided with water and sanitation services per dollar of aid seems to depend on some of the institutional variables. In countries where the WSS sector institutional reforms have already been in progress or those where there is less corruption seem to do better as do countries with a larger population. These are hardly surprising results. However, historically there have also been exceptions. Even when aid in general has not been effective in a country, there are cases where it has been effective in WSS. There could be three main reasons for this: water and sanitation projects typically take considerable amount of time and hence to some extent there is a lag before what happens in the rest of the economy also manifests in WSS sector. Second, water and sanitation are such basic services that failure of services can lead to protests and people marching to the water utility or the minister concerned. Hence, even while significant improvements do not take place, there is an internal drive to manage the systems from failing miserably. There appears to be common view that providing water and sanitation services is so straight forward that failure here can be construed as incompetence which neither politicians nor public officials want. Third, markets (such as water vendors, bottled water, marketing of pumps and filters) emerge and thrive when public water and sanitation systems are inadequate.

Two kinds of biases are crucial in this sector and these seem to reinforce each other. The *paradigm of masculinity* means there is an inherent bias in this sector towards large projects and ‘hard’ infrastructure involving construction, building and control of resources as compared with ‘soft’ infrastructure of improving the institutions, enhancing the human right to water and sanitation and improving stakeholder participation in decision making. However, hard infrastructure is easier to measure and monitor while soft infrastructure can take longer to build and is difficult to count. This results in a *paradox of accountability* whereby donors who would like to improve accountability of their funds then inadvertently

might contribute to reinforcing the paradigm of masculinity as their demand for accountability makes hard infrastructure projects more readily attractive to donors while the more difficult reforms of institutions and creating of deliberative and participatory governance structures necessary to fully implement a human right to water and sanitation will take longer, difficult to measure and hence remain less attractive to donors even while lip service is paid to human rights and participatory institutions.

Should aid be used to continue to fund projects in this sector? And if so, what is the best way to spend this effectively? Saving lives of infants and children is often used as the justification for water supply and sanitation projects. Cost benefit studies show that usually the time savings and productivity improvements are likely to outweigh the health benefits. Even so, there will remain an important challenge for WSS interventions to have measurable impact on health outcomes. This concerns water quality. Almost all indicators of progress in this sector focus on expanding the service to citizens and consumers who presently lack the services. There is a clear need to develop water quality indicators and mainstream these for benchmarking the performance of water utilities and ultimately connect this with allocating and delivering aid.

While aid is needed it may have to be used in quite a different way in the future than merely chasing projects. Given that 'low hanging fruit' have been taken, making further progress in this sector is going to be more difficult and hence would require more effective and innovative ways of using aid. As the regression results discussed here suggest, much of the secret of success in delivering water and sanitation systems may lie outside the sector in terms of improving institutional environment and reducing corruption. In some sense such a result could be picking up some endogenous relationships. In others, it seems to resonate with public opinion of citizens in donor countries and their concern that 'corruption makes it pointless donating' (TNS 2010). Yet, there is also the danger that such results might overshadow a lot of good work that is being done on the ground and taint aid with 'moral imperialism' as new conditionality. There is also a paradox here—if institutional change and broader governance reforms are crucial then why invest in water and sanitation at all.

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Appendix Table A1: Aid to water supply and sanitation sector (US$ million in constant 2010 prices)

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Total aid (I+II)	3296.6	4052.7	3631.8	3007.6	2381.9	3833.8	3171.5	2087.0	3330.3	4408.9	6081.2	6335.4	6562.8	7535.4	8650.9	7780.1	7902.9
I. DAC countries total	2377.2	3168.2	2957.6	2413.9	1907.1	2999.4	1934.3	1320.4	2355.7	3022.2	4637.0	4089.1	4491.9	5975.5	6601.4	5194.1	4877.0
Australia	8.3	23.1	20.6	24.3	23.5	72.5	24.9	6.8	38.2	14.5	2.7	24.9	2.4	32.3	61.4	217.8	230.1
Austria	9.9	33.5	8.1	19.2	14.6	8.9	6.8	13.2	19.7	20.1	16.8	20.4	24.1	36.6	23.2	18.0	26.6
Belgium	9.3	10.1	12.7	14.0	12.3	9.9	18.1	41.0	24.3	15.9	57.1	68.0	89.5	103.0	60.7	48.9	69.8
Canada	13.2	30.5	23.9	15.1	26.3	25.0	11.6	28.4	72.4	80.1	41.7	20.7	23.8	46.9	73.8	16.3	45.0
Denmark	38.9	167.1	80.2	60.9	155.1	43.6	18.8	30.1	57.0	249.5	96.4	144.6	31.7	19.0	164.6	139.4	88.1
Finland	17.0	26.0	15.1	12.0	12.2	13.3	10.9	21.1	16.7	5.8	43.2	44.2	31.0	51.2	54.3	99.4	122.2
France	264.4	400.2	232.7	143.6	204.8	145.1	94.7	187.7	168.6	176.0	113.6	254.0	383.5	360.5	779.0	500.9	134.9
Germany	449.0	346.8	529.1	445.3	271.0	356.9	336.3	208.9	350.3	423.7	401.9	497.1	594.0	906.4	820.5	750.8	1040.7
Greece	..	..	..	..	..	..	..	0.9	1.2	1.3	0.5	1.0	2.8	0.8	3.0	0.2	..
Ireland	..	..	..	..	..	6.8	7.9	13.4	19.9	18.3	16.8	16.9	20.6	25.2	17.0	9.9	11.4
Italy	31.0	40.3	49.1	17.0	17.8	51.8	16.5	41.8	49.0	12.0	73.7	51.5	56.9	163.7	55.9	65.0	21.1
Japan	1181.7	1731.5	1501.7	1093.5	664.3	1791.2	541.4	314.3	1039.5	709.4	2128.7	1256.1	1930.1	1668.2	2786.0	1933.3	1692.4
Korea	..	..	..	..	..	..	..	..	..	..	..	80.8	74.7	270.4	70.9	283.1	172.1
Luxembourg	..	..	..	..	..	..	9.6	8.6	10.7	13.5	13.1	10.3	13.0	19.0	22.9	21.1	21.5
Netherlands	107.4	92.8	100.7	115.5	61.5	46.3	116.6	125.5	112.3	146.5	207.1	455.2	363.7	373.1	196.5	123.1	129.5
New Zealand	0.5	..	..	..	..	..	..	1.5	1.3	1.9	5.0	3.2	2.6	0.7	1.9	6.1	10.4
Norway	28.7	7.3	12.1	29.2	35.1	16.2	45.3	25.8	17.2	21.8	48.5	25.3	39.9	51.8	49.8	47.5	17.8
Portugal	..	..	..	0.2	1.5	11.8	1.1	0.4	0.1	2.2	2.5	0.6	1.6	0.3	0.4	1.0	0.6
Spain	37.7	19.6	19.0	29.0	56.8	78.4	45.1	44.4	86.8	44.9	71.3	55.4	109.9	621.6	575.3	308.5	155.1
Sweden	63.9	50.4	18.7	64.1	29.8	23.9	54.9	24.8	71.7	25.6	116.9	73.8	45.1	87.4	20.0	55.0	57.5
Switzerland	9.8	26.5	19.1	31.0	22.8	30.9	21.0	26.1	27.4	39.4	65.3	34.5	43.7	34.7	50.4	49.6	331.5
United Kingdom	35.8	66.0	58.6	94.2	105.0	151.8	104.2	67.3	65.3	45.0	88.3	132.7	175.4	255.9	252.0	67.8	35.1
United States	70.7	96.5	256.2	206.0	192.8	115.1	448.6	88.5	105.9	954.7	1026.2	817.8	432.1	846.8	461.9	431.3	463.4
II. Total Multilateral	919.4	884.6	674.2	593.6	474.8	834.4	1237.2	766.6	974.6	1386.7	1444.2	2246.3	2070.9	1559.9	1903.9	2482.3	2960.4

Source: OECD-CRS.

Appendix Table A2: Relative shares of bilateral donors in total bilateral WSS aid

Table A-2: Share each donor to volume of aid to Water supply and sanitation in a given year																	
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Total (I+II)	3745.9	4873.4	4777.4	4129.4	3279.1	5218.2	4759.2	3115.3	4272.2	5160.1	7034.0	7204.6	7173.9	7561.9	8697.5	7780.1	7356.8
Bilateral total (I)	2594.5	3721.3	3818.1	3275.1	2595.3	3939.3	2826.4	1977.1	3012.5	3534.8	5379.2	4699.1	5054.4	6041.2	6656.1	5194.1	4521.4
Australia	0.6%	1.1%	1.0%	1.7%	1.9%	4.2%	2.2%	0.8%	2.4%	0.7%	0.1%	0.7%	0.1%	0.6%	1.1%	4.2%	4.3%
Austria	0.4%	1.1%	0.3%	0.8%	0.8%	0.4%	0.4%	1.1%	0.9%	0.7%	0.4%	0.5%	0.5%	0.6%	0.3%	0.3%	0.5%
Belgium	0.4%	0.4%	0.5%	0.6%	0.7%	0.4%	1.1%	3.4%	1.1%	0.5%	1.2%	1.6%	1.8%	1.6%	0.9%	0.9%	1.4%
Canada	0.9%	1.5%	1.1%	0.9%	1.9%	1.1%	0.8%	2.7%	3.9%	3.3%	1.0%	0.5%	0.5%	0.8%	1.3%	0.3%	0.9%
Denmark	2.1%	6.3%	3.3%	2.9%	9.7%	2.0%	1.2%	2.6%	2.6%	8.7%	2.2%	3.6%	0.7%	0.3%	2.4%	2.7%	1.8%
Finland	0.8%	0.9%	0.6%	0.5%	0.7%	0.6%	0.6%	1.6%	0.7%	0.2%	0.9%	1.1%	0.6%	0.8%	0.8%	1.9%	2.4%
France	13.0%	13.8%	8.9%	6.4%	11.9%	6.4%	5.8%	15.3%	7.4%	5.9%	2.4%	6.1%	7.6%	5.6%	11.2%	9.6%	2.8%
Germany	18.7%	10.5%	18.0%	17.8%	14.2%	14.4%	19.2%	16.0%	14.5%	13.4%	8.3%	11.6%	11.7%	14.0%	11.8%	14.5%	21.8%
Greece	...	...	...	...	...	...	...	0.1%	0.1%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	...
Ireland	...	...	...	...	...	0.3%	0.5%	1.0%	0.8%	0.5%	0.3%	0.4%	0.4%	0.4%	0.2%	0.2%	0.2%
Italy	1.9%	1.6%	2.0%	0.8%	1.1%	2.4%	1.0%	3.5%	2.2%	0.4%	1.6%	1.2%	1.1%	2.5%	0.8%	1.3%	0.4%
Japan	42.0%	49.9%	46.6%	42.8%	29.0%	49.5%	23.8%	20.7%	42.2%	23.2%	47.1%	33.9%	49.4%	31.7%	43.6%	37.2%	34.7%
Korea	...	...	...	...	...	...	...	...	...	...	...	1.6%	1.3%	4.6%	1.2%	5.5%	3.6%
Luxembourg	...	...	...	...	...	...	0.7%	0.8%	0.5%	0.5%	0.3%	0.3%	0.3%	0.3%	0.3%	0.4%	0.4%
Netherlands	5.5%	3.4%	4.1%	5.5%	3.8%	2.1%	7.1%	10.0%	4.8%	4.8%	4.4%	10.7%	7.2%	5.7%	2.8%	2.4%	2.7%
New Zealand	0.0%	...	...	...	...	...	...	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.0%	0.0%	0.1%	0.2%
Norway	2.2%	0.4%	0.7%	2.0%	2.9%	0.9%	3.4%	2.5%	0.9%	0.9%	1.2%	0.6%	0.8%	0.8%	0.8%	0.9%	0.3%
Portugal	...	...	...	0.0%	0.1%	0.5%	0.1%	0.0%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Spain	2.3%	0.8%	0.9%	1.5%	3.8%	3.9%	3.1%	3.9%	4.1%	1.6%	1.6%	1.3%	2.2%	9.5%	8.3%	5.9%	3.2%
Sweden	3.1%	1.6%	0.6%	2.6%	1.6%	0.9%	3.3%	1.9%	3.0%	0.8%	2.5%	1.8%	0.9%	1.4%	0.3%	1.1%	1.1%
Switzerland	0.5%	1.0%	0.8%	1.5%	1.4%	1.4%	1.3%	2.2%	1.3%	1.4%	1.6%	0.9%	1.0%	0.6%	0.8%	1.0%	6.2%
United Kingdom	1.9%	2.4%	1.9%	3.5%	4.9%	5.0%	4.9%	4.3%	2.4%	1.2%	1.6%	2.6%	2.9%	3.8%	3.8%	1.3%	0.7%
United States	3.7%	3.5%	8.8%	8.2%	9.5%	3.7%	19.4%	5.4%	4.1%	31.0%	21.2%	18.7%	8.9%	14.3%	7.0%	8.3%	10.0%
Share of six biggest donors	80.4%	83.5%	89.7%	84.1%	79.2%	82.8%	80.3%	71.7%	77.2%	87.0%	85.9%	84.7%	87.7%	79.7%	85.7%	81.0%	80.5%

Source: Author's calculation based on OECD CRS

Appendix Table A3: Estimating aid effectiveness in general and effectiveness of Watsan aid

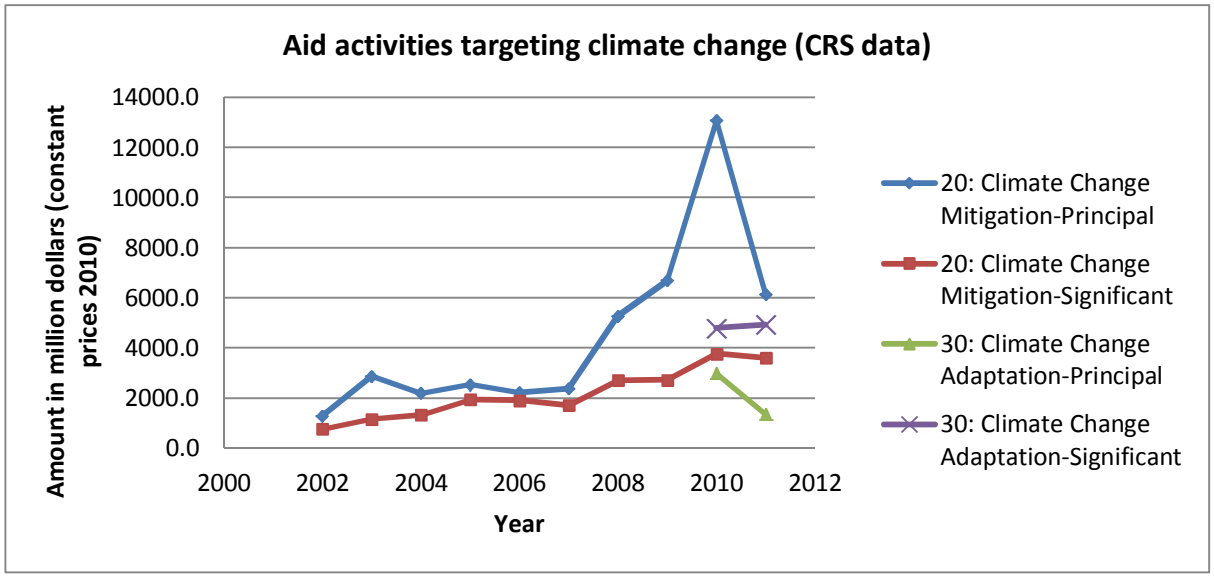
Country name	Number of poor people in 1995	Number of poor people in 2010	Number of poor people moved out of poverty between 1995 and 2010	Total ODA 1995-2010 US$ million (constant 2010 prices)	ODA effectiveness: Reduction in poverty per US$ million of aid	Total aid for WatSan 1995-2010 US$ million (constant 2010 prices)	Persons (X1000) with improved Water and sanitation between 1995-2010	Aid effectiveness in watsan: persons with improved water or san per US$ million Watsan aid
Argentina	2064240	2616751	-552510	2089.5	-264.4	117.6	-64951.9	-552.4
Armenia	1254970	579908	675062	5103.4	132.3	325.0	60.1	0.2
Azerbaijan	3001995	254488	2747507	3900.6	704.4	721.4	4952.2	6.9
Bangladesh	100502272	119466879	-18964608	25130.0	-754.7	2338.5	63659.8	27.2
Belarus	49949	27996	21953	578.6	37.9	2.2	-1306.9	-601.9
Bolivia	1589066	2553371	-964305	13859.8	-69.6	961.1	4159.8	4.3
Brazil	38728440	27078467	11649973	5150.5	2261.9	729.6	83221.4	114.1
Cambodia	8399332	8017633	381699	9928.0	38.4	430.6	8500.1	19.7
Cameroon	7217702	5950993	1266709	13572.3	93.3	390.1	10010.5	25.7
Chile	1111348	551038	560310	2004.7	279.5	65.5	7025.4	107.2
China	890337905	446349741	443988164	35013.9	12680.3	5614.7	781847.1	139.3
Colombia	8074703	9605591	-1530888	9800.9	-156.2	103.8	20261.6	195.2
Costa Rica	408266	304449	103816	594.0	174.8	211.7	2437.2	11.5
Côte d'Ivoire	6710278	9150717	-2440439	12948.9	-188.5	260.5	6010.1	23.1
Dominican Republic	882560	1226951	-344391	2188.1	-157.4	313.3	3852.9	12.3
Ecuador	2658541	2158770	499771	3797.2	131.6	341.5	9152.8	26.8
Egypt, Arab Rep.	16331177	13746578	2584600	28342.0	91.2	2041.1	50239.2	24.6
El Salvador	1181431	955368	226063	4414.3	51.2	326.0	1806.7	5.5
Ethiopia	48243828	64399662	-16155834	31406.1	-514.4	1245.6	40482.8	32.5
Georgia	663213	1493820	-830608	6930.2	-119.9	180.3	-664.1	-3.7
Guinea	6156554	6950792	-794238	5390.1	-147.4	308.1	3929.0	12.8
Honduras	2712094	2610998	101096	10037.2	10.1	734.3	4910.9	6.7
India	788262073	926054290	-137792217	31552.6	-4367.1	7277.2	604992.0	83.1
Indonesia	161080670	136534207	24546463	25810.1	951.0	2029.6	102295.9	50.4
Iran, Islamic Rep.	4927011	5939774	-1012764	2676.1	-378.4	18.1	40871.3	2260.4
Kazakhstan	2875442	309632	2565810	3931.6	652.6	353.9	245.5	0.7
Kenya	14710866	27239003	-12528136	14680.9	-853.4	1232.3	16194.8	13.1
Kyrgyz Republic	1374501	1743422	-368921	5122.8	-72.0	94.4	1919.0	20.3

Appendix Table A3 continued

Madagascar	11615167	18565132	-6949965	11646.5	-596.7	265.7	6748.7	25.4
Malaysia	2273472	832213	1441259	1453.7	991.5	1508.7	18045.5	12.0
Mali	9223777	11852624	-2628847	11919.5	-220.6	679.4	7896.2	11.6
Mauritania	1339985	1649906	-309921	5454.4	-56.8	227.6	1408.7	6.2
Mexico	15728129	5744550	9983579	2893.1	3450.8	868.5	59798.8	68.9
Mozambique	14735825	19128478	-4392653	26963.7	-162.9	1270.7	7154.2	5.6
Nicaragua	1671038	1837561	-166523	14850.5	-11.2	662.8	2238.1	3.4
Niger	8407372	11676319	-3268948	7900.8	-413.8	512.9	5062.0	9.9
Panama	605311	609785	-4474	573.6	-7.8	231.6	-3982.9	-17.2
Paraguay	994541	1042952	-48411	1616.1	-30.0	105.9	4811.2	45.4
Peru	6776338	5181418	1594920	7757.3	205.6	1605.3	12774.3	8.0
Philippines	36453267	42009696	-5556429	11613.2	-478.5	847.8	52713.3	62.2
Senegal	6616611	7506400	-889789	13226.9	-67.3	1180.8	6683.6	5.7
South Africa	15851425	17857873	-2006448	12616.9	-159.0	593.4	20532.3	34.6
Sri Lanka	8458883	6017481	2441402	10424.4	234.2	1787.7	11097.9	6.2
Thailand	10455642	4357741	6097901	3422.5	1781.7	368.8	26409.2	71.6
Tunisia	1825734	850666	975068	5888.8	165.6	1453.5	-14622.7	-10.1
Turkey	5792411	3870090	1922322	7957.8	241.6	1541.2	35622.3	23.1
Uganda	17905705	25276053	-7370347	21194.1	-347.8	1157.8	18881.9	16.3
Ukraine	4217591	160568	4057023	3324.7	1220.3	25.6	-10998.8	-429.6
Uruguay	65844	115806	-49962	582.2	-85.8	10.3	599.2	58.3
Venezuela, RB	4547402	5022534	-475132	1068.7	-444.6	75.5	-39032.3	-516.8
Vietnam	61697344	39736114	21961230	34333.1	639.7	5051.5	66354.0	13.1
Zambia	7212019	10765927	-3553908	18458.4	-192.5	757.7	5506.1	7.3

Source: Number of poor people estimated from World Development Indicators (using population average for 1994 to 1996 and for years 2008 to 2010 and poverty (income less than US$2 a day – average for 1993-96 and that for years 2006-08); Aid data from OECD CRS; number of persons with access to improved water or improved sanitation from WHO-UNICEF Joint Monitoring Programme database.

Appendix Figure A1: CRS data—aid activities targeting global environmental objectives—climate change mitigation and adaptation



Source: Based on OECD-CRS data.