

Models for delivering safe water and effective sanitation in urban / rural areas

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Abstract

WaterAid has been implementing water and sanitation projects to the world's poorest for over 20 years. The urbanisation of the population in the developing world is occurring at an increasing rate. The poorest of the poor are now settling in urban areas in massive slum developments - resulting in tensions over access to already over-worked infrastructure, along with urban areas now swallowing-up the majority of world aid project dollars - while villages and remote communities miss out completely. WaterAid Australia has recently reviewed projects in Bangladesh and Nepal and reviewed the issues surrounding rural and urban water scarcity and the approaches being used to effectively deliver safe water and effective sanitation to the poorest.

Keywords

Water; sanitation; urbanisation; aid; development; third world; slums; hygiene education; subsidies; WaterAid; ecological footprint

INTRODUCTION

It is clearly recognised that clean water and adequate sanitation are essential requirements to break the poverty cycle and allow communities, regions and countries to achieve development and sustainability (Tipping et al, 2005). Yet 1.1 billion people in the world lack access to safe drinking water, 2.6 billion lack adequate sanitation (60 per cent of the population of developing countries), a child dies every 15 seconds from easily preventable water related diseases and 1.8 million people die every year from diarrhoeal diseases (WBCSB, 2005).

Most countries are signatories to the United Nations Millennium Development Goals (MDGs) and in relation to water and sanitation these include the Millennium Development Targets (MDTs):

- of halving by 2015 the proportion of people without access to safe drinking water in 1990 (Stockholm 2000)
- of halving by 2015 the proportion of people without access to hygienic sanitation in 1990 (Johannesburg 2002)

Since 1990, Wash (2005) estimates that 747 million people have gained access to sanitation facilities (205,000 people every day) – despite this huge achievement, a further 1089 million rural and 1085 million urban dwellers will need to gain access if the 2015 target is to be realised. WHO, (2005) estimates that 700,000 people per day need to be provided with safe water and sanitation to meet the MDTs. From most reports, depending upon the accuracy of base-line data – the MDTs for water and sanitation will require significantly more resources than currently being applied to meet the targets. For example in Nepal alone the targets are: sanitation coverage: 1990 – 14%; 2000 – 31%; and 2015 – 57%. In 2003 it was estimated that 13,000 latrines needed to be installed every month to reach the sanitation target (Pandey, 2002).

Global coverage figures from 2002 indicate that, of every **10** people:

- **5** have a connection to a piped water supply at home
- **3** make some use of improved water supply – ie well/public standpipe
- **2** are unserved
- **4** have no improved sanitation

(WBCSD, 2005)

Public campaigns such as ‘Make Poverty History’ are highlighting the fact that the MDTs will fall well short if we continue at the current level of resource allocation.

Increasing urbanisation

The urbanisation of the world’s population continues at an alarming and ever increasing rate. In 1970, only 37 per cent of the world’s population were living in urban areas and by 2006/2007 this figure is expected to be 50 per cent. Of the 3 billion currently living in urban areas – approximately 1 billion people are living in slums and this is expected to double by 2030. Nearly all of the population growth in the world between now and 2050 will be in the urban slums of the developing world (Tipping, 2005)!

The growth of urbanisation and mega-slums brings a new set of complex issues of a size and scale never before seen by humanity. Slums are formally defined as being contiguous settlements where the inhabitants are characterised as having inadequate housing and basic services. The inhabitants of slums also generally have the following characteristics:

- they do not have land tenure and hence are seen as invisible by governing bodies and service providers;
- they are more transient – either moving on within the urban area or other areas seeking employment or displaced;
- they are the poorest of the poor;
- women headed households constitute 30 per cent or more of the total households;
- limited access to services ie not uncommon for 150 people to queue for one toilet; and
- often forced to pay high prices ie forced to rely on private water vendors and pay 5 to 7 times more for a litre of water than the average Australian (Tipping, 2005).

Decreasing resources – Ecological Footprint

In addition to increasing population and urbanisation – is the total area required to produce the food and fibres that countries consume, its energy consumption and space for infrastructure – referred to as the *Ecological Footprint*. It is estimated that by 2050, the Earth’s estimated population of 9 billion will require 1.8 – 2.2 Earth-sized planets in order to sustain their consumption of crops, meat, fish, wood and to hold CO₂ atmospheric levels constant (WWF, 2002).

Country	Ecological Footprint Global hectares per person		
Bangladesh	0.53	Middle East	2.07
India	0.77	Russia	4.49
Nepal	0.83	Japan	4.77
Africa	1.36	United Kingdom	5.35
Papua New Guinea	1.42	Australia	7.58
China	1.54	United States	9.70

Decreasing freshwater

Less than 3 per cent of the world’s water is fresh and of this 2.5 per cent is locked up in Antarctica, the Arctic and glaciers, thus people must rely on the remaining 0.5 per cent. Of the 0.5% fresh water:

- **98 per cent** is stored in underground aquifers (supplying 50% of all drinking water, 40% of industrial water and 20% of irrigation water);
- **1.1 per cent** falls as rain (The Earth’s hydrological cycle constantly replenishes this freshwater supply. It is estimated that more than half of what is actually available is used by humanity);
- **0.89 per cent** in natural lakes;
- **0.02 per cent** in rivers (WBCSD, 2005).

Global water use doubled between 1960 and 2000 – in line with world population – with average water use of 550 cubic metres per person per year. On average, high income countries use twice as much water per person as low income countries (WWF, 2002). Table 2 shows the change in water use based upon income groups of countries – the more affluent the country, the greater proportion is used in domestic and industrial water use.

Income Group	World	High Income	Low & Middle Income
Domestic Use	8%	11%	8%
Industrial Use	22%	59%	10%
Agricultural Use	70%	30%	82%

MODELS FOR DELIVERING SAFE WATER AND EFFECTIVE SANITATION

In this paper I will briefly outline six models by which we may address the issues confronting access to safe water and effective sanitation. This is not a definitive review – but is provided to demonstrate some of the current solutions and issues to evoke further discussion.

1. The hardware solution

According to the OECD, 52 per cent of all aid in the water sector goes to supplying large systems to urban areas, mostly by large multi-national donors such as the World Bank and the Asian Development Bank. It is estimated that currently 86 per cent of total funds are allocated to hardware (ie pipes & plants) – with the remaining 14 per cent allocated to software (ie community motivation and hygiene education). Of total aid for water and sanitation projects – less than 20 per cent of funds on average are allocated to sanitation – for example in Africa only 12 per cent of the money invested in water supply and sanitation went specifically to fund sanitation – and in Asia only 15 per cent (WASH, 2005 pp 13).

“no-one wants to speak about toilets. Until you can break through this barrier, sanitation will always be a battle” Ronnie Kasrils, Minister of Water Affairs and Forestry, South Africa (Kar, 2003)

While these projects are the most common and deliver water to many people, there are some significant limitations, namely:

- per capita costs are high
- little if any involvement in decision-making and ownership by the community
- sanitation services are often a low priority
- require significant capacity-building in the areas of governance and technical expertise for on-going operation and maintenance
- are not pro-poor as the costs are often beyond their financial capacity

2. The community-led approach

WaterAid and their in-country partners have been delivering safe water, effective sanitation and hygiene education in fifteen countries for over twenty years – primarily in rural areas and more recently in urban slum areas. The issues of options, costs, locations of services, maintenance and all other decision-making are placed squarely on the community to decide – via a ‘representative committee’ to ensure ownership. This element forms a key part of the process of engagement with the community from the on-set of a project – ratified in a Memorandum of Understanding – signed by the members of the ‘Committee’ and forms part of the project completion process. It is the community’s role to also decide who gets a subsidy and who pays. The key outcomes of these programs have been:

- sustainable projects – over 94 per cent of WaterAid projects are still functional after 5 years (WaterAid UK, 2005)
- demonstrated pro-poor and gender sensitive
- appropriate technology has been applied
- successful capacity-building at the community level, in-country non-government organisations, local government and national organisations ie community decision-making, operation and maintenance

3. The ‘No aid’ approach

There is a school of thought in the aid and development industry that as soon as one offers a subsidy (perceived hand-out) to an individual and/or community – that this will lead to an unsustainable outcome (Kar, 2003). Without doubt – there is a general perception among many communities – that they are waiting – in fact demanding support from the ‘affluent west’ as delivered via aid and development agencies. This dependency may lead to unsustainable outcomes.

“everyone – even the poorest – has to pay for these services. Free services are never well managed or maintained” Roberto Bianchi, CEO Aguas Del Illmani, La Paz Bolivia (Kar, 2003)

It also needs to be noted that there are no water and sanitation systems in the developed world which have been based upon total cost recovery – and hence there has always been an underlying subsidy – yet there is an expectation that such services can be supplied on such a basis in developing countries. Water and sanitation should be seen as a global public good (GPG) – as they can no longer be adequately provided through domestic policy action alone. By ensuring access to safe water and effective sanitation, diseases can be controlled, peace and security enhanced and clear benefits begin to accrue at the national level – it benefits the international community as a whole (Tipping et al 2005).

4. The aid = development approach

It is clear that the poorest of the poor – do not have the capacity to pay, especially upfront payments for access – and many schemes which do not provide subsidies – exclude the poor from access. Table 3, indicates that many government agencies do not have the capacity to improve services and additional external assistance is urgently required.

Even more importantly, there are a number of studies which show that improvements in water and sanitation significantly improve health outcomes – which then can be translated into economic benefits, for example:

- a ten-year increase in average life expectancy at birth can translate into a 0.3 – 0.4 per cent economic growth per year;
- a yard water tap doubles the chance of hand washing (hand washing alone can reduce diarrhoea by 30 per cent);
- an investment of \$1 in providing access to safe water provides a net economic benefit of between \$5 - \$28; and
- an additional investment of \$11.3 billion in water and sanitation would generate \$84 billion in total economic benefits (Tipping et al, 2005).

Table 3 Annual Local Authority Capital Expenditure for 1998
(Tipping, 2005, pp 35)

	Annual Expenditure per capita
Developed Countries	2,893
Asia Pacific	152
Africa	12
Arab States	54
Latin America	56

Table 4 shows that investment levels need to be more than doubled to provide access to water and sanitation for public health.

Table 4 Indicative Annual Investment in Water Services for Developing Countries (billions of US\$) - (GWP, 2003:3 in Tipping, 2005 pp51)

	Today	2002-2005
Drinking Water	13	13+
Sanitation & Hygiene	1	17
Wastewater Treatment	14	70
Industrial Effluent	7	30
Agriculture	32.5	40
Environment Protection	7.5	10
Total:	75	180

Australia currently gives 0.25 per cent of Gross National Income (GNI) in Official Development Assistance (ODA) – this compares with 0.15 per cent of GNI by the United States and 0.34 per cent by the UK and the recommended United Nations level of 0.7 per cent of GNI/GDP – which was agreed back in 1970! (OECD, 2005)

5. The technological approach

Up to now – the most effective technologies in developing countries have been those that have been around for thousands of years and at best 12th century – with the possible exception of plastic containers and pipes. In many ways – the challenges faced by urban areas in developing countries is very similar to those faced by our city founders back in the 1850-1870's – when Melbourne and Sydney had raw sewerage running down the main streets and water had to be carted in by horse-drawn tankers – with water related diseases killing many inhabitants. The solutions found for these problems 150 years ago are only now beginning to come under immense stress, as a result of climate change and increasing urban population – and we are now experimenting with more local and community-based solutions ie rainwater harvesting, local recycling, wetlands etc.

The real question is – do we allow or force those in developing communities through the same evolution of technology to solve their water and sanitation problems (ie repeat the errors of the past) – which we now know are unsustainable in the long-

term, including the potential impact on our ecological footprint – or do we explore and apply new technologies to an age-old problem?

6. Privatisation approach

Many thought that privatisation may provide the answer by replacing inefficient government agencies and opening up the market to competition and cost-effective services. However private companies that have operated in the water and sanitation area have been criticised for not extending services to the poor, only providing better services to those already connected and significantly increasing tariffs without any effective controls ie regulators (Tipping et al, 2005).

The myth that private companies can provide more cost-effective services than government agencies is no longer a viable belief – as there are many examples where government-owned agencies can adopt ‘privatised’ best practices and/or deliver services via public/private partnerships and perform at high levels of efficiency.

CONCLUSIONS

If we are to tackle the immense challenges ahead in relation to providing safe water, effective sanitation and hygiene education, the following comments are pertinent:

1. Aid spending is not a one-way street – not only will better health outcomes be achieved – but also significant economic benefits can be achieved
2. To achieve the MDTs – aid spending needs to double – NOW!
3. Aid and development programs must increasingly focus on water, sanitation and hygiene education – as they are essential precursors for development and breaking the poverty cycle
4. Water, sanitation and hygiene education programs must ensure a high level of community ownership (via local contributions – but not total cost recovery) and local capacity building – to ensure sustainability
5. Where we work - we must aim for 100 per cent access to safe water, effective sanitation and hygiene education
6. We must maintain and increase efforts to supply safe water, sanitation services and hygiene education in rural areas – to slow down the rate of urbanisation and minimise increasing pressures
7. We must identify more effective ways to involve urban communities in solving water and sanitation problems and in particular slum communities – including unlinking land-tenure with the provision of essential services
8. We must identify and implement alternative technological solutions to supply safe water and sanitation services to developing countries – especially in urban areas ie sustainable solutions at the individual household and community level – Australia is well placed to take a lead in this area
9. The delivery of cost-effective water and sanitation services will contain a mix of government agencies and private companies – that are appropriate for the local conditions and economic objectives of the particular country
10. We must increase the proportion of funds allocated to capacity building – governance, management and technical support – to ensure sustainability

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