



Water & sanitation planning in developing countries

Session 4

Goals of W&S policy and planning

Objectives

- Review the public health, environmental, and economic goals of improving W&S services
- Discuss some reasons why, despite these many benefits, W&S services don't always "compete" well alongside other planning and investment priorities

A. Public health benefits

Modern W&S networks were first developed out of concerns for public health

- First emphasis on flushing wastes out of streets with large volumes of water (“pythogenic” theory of disease, *i.e.*, disease emanates from foul odors)
- Lack of appreciation for sanitation-health links likely exacerbated typhoid and cholera epidemics of the 19th century
- Eventually germ theory of disease highlighted need for clean water supplies, managing wastes

Types of water- and sanitation-related disease

- Waterborne, *e.g.*, cholera, typhoid: Consumption of contaminated water or food
- Water-based, *e.g.*, schistosomiasis, dracunculiasis (Guinea worm): Infection by parasite in water habitat
- Water-washed, *e.g.*, trachoma: Insufficient water for personal hygiene
- Water-related, *e.g.*, malaria, dengue: Vector requires water habitat; infection does not necessarily occur there

Policy/planning strategies must address the particular health challenges confronted

How important is W&S to health?

Direct effects:

UNICEF estimates that, at any given time, half the population of the developing world is suffering from a water or sanitation-related disease.

Water- and sanitation-related disease is estimated to claim 3-7 million lives each year, although this includes diseases for which the vector requires a water habitat (*e.g.*, malaria and dengue), which are water resources management, not merely W&S service, related.

What about diarrhea?

- By far the most prevalent water and sanitation service-related disease
- Causes 4% of all deaths and 5% of health loss to disability globally
- 4 billion cases annually, 2.2 million deaths attributed in 1998; ~90% of victims are children <5
- Both waterborne and water-washed types exist—debate as to which is more prevalent

Indirect effects of improved W&S on health

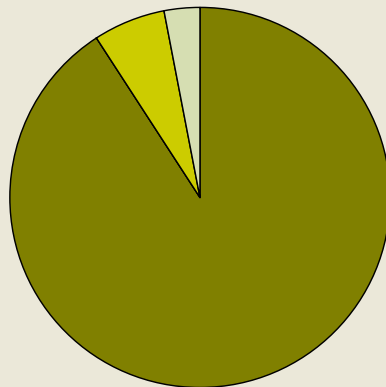
- Reduction in injuries associated with water fetching
- Children receive more and better care when mothers' water fetching burden is eased
- Nutritional uptake is estimated to be 10-20% lower among children with chronic diarrhea
- Others?

Over the past decade, it has become less common to justify W&S projects on the basis of health benefits. Why?

- Curative approaches to water- & sanitation-related diseases are reducing morbidity
- It has been difficult to establish a consistent link between improved water & better health
- There is, however, evidence that sanitation improvements are consistently linked to better health (why the difference?)
- ‘Water and sanitation’ projects are often just water projects: health outcomes are uncertain

Sanitation at the heart of health?

Global deaths
per year



Service-related disease

Esrey *et al.* (1996) found that:

- Improvements in water supply had positive, no, or negative association with reduction in diarrheal incidence
- Improvements in sanitation services had consistently positive association with reduction in incidence
- Consistent with Cairncross (2003) suggestion that water-washed diarrhea should be the focus of intervention: But still major debate

B: Environmental & aesthetic benefits

- Management of human wastes reduces negative environmental impacts, *e.g.*, on freshwater and marine habitats
- Sound water management can prolong life of water sources (*e.g.*, overdepletion, saltwater intrusion)
- Water quality improvements can reduce reliance on fuelwood
- Others?

Environmental/economic benefits

- Wastewater irrigation can lower treatment costs, reduce needs for agricultural freshwater
- Cleaner water bodies increases opportunities for recreation and tourism

Photo by IWMI

C: Economic benefits

What are some possible benefits at the household level of improving W&S services?

- Time savings: water fetching/treatment, travel to sanitation facility
- Higher school attendance, earning potential
- Increased property values
- Increased disposable income: reduced health care, water treatment, private infrastructure costs

Improving services can also lower costs

Example: Volumetric charges for water supply

Country	Haiti	Indonesia	Peru
Year	1993	1993	1998
Price/m ³ , vendors	\$5.50-16.50	\$1.20-5.20	US\$3.00
Price/m ³ , piped system	\$1.00	\$0.09-0.50	\$0.15
Cost reduction factor	5.5-16.5	2.4-57.8	20

Economic benefits, cont'd.

What about at the national level?

- More productive (and educated) workforce
- Reduced budgetary pressure for health care
- Fewer boycotts of agricultural products
- Employment generation
- Infrastructure as an 'engine of growth'?

Infrastructure and growth

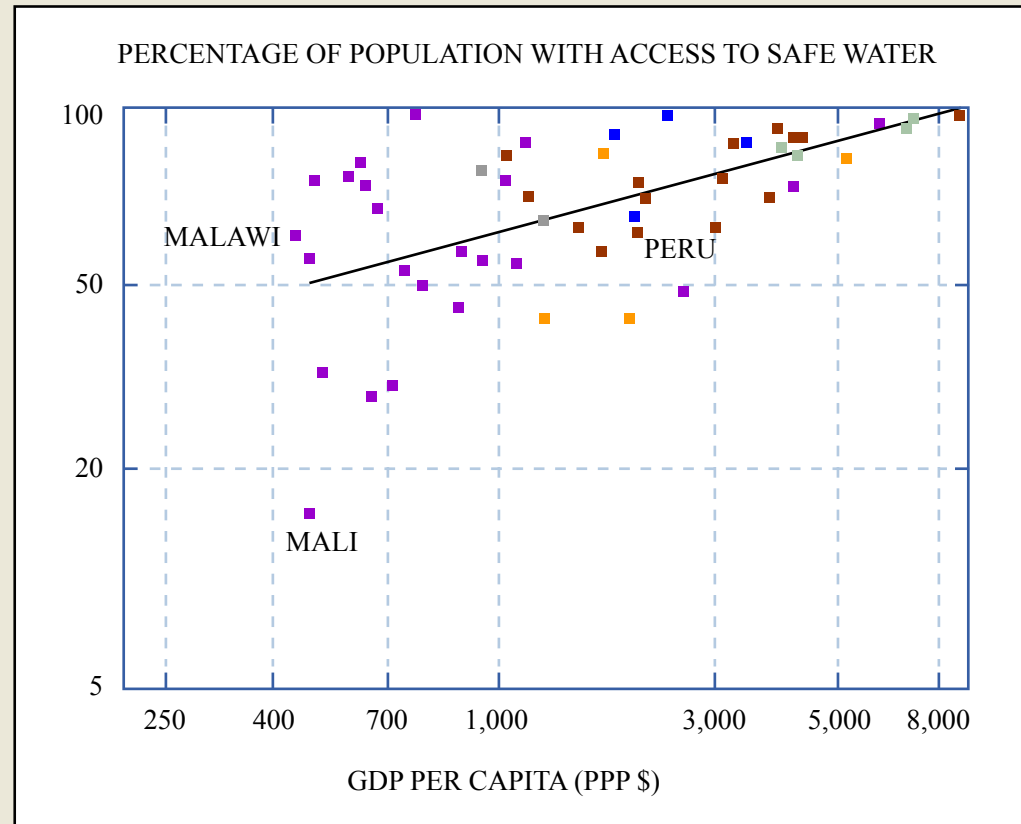
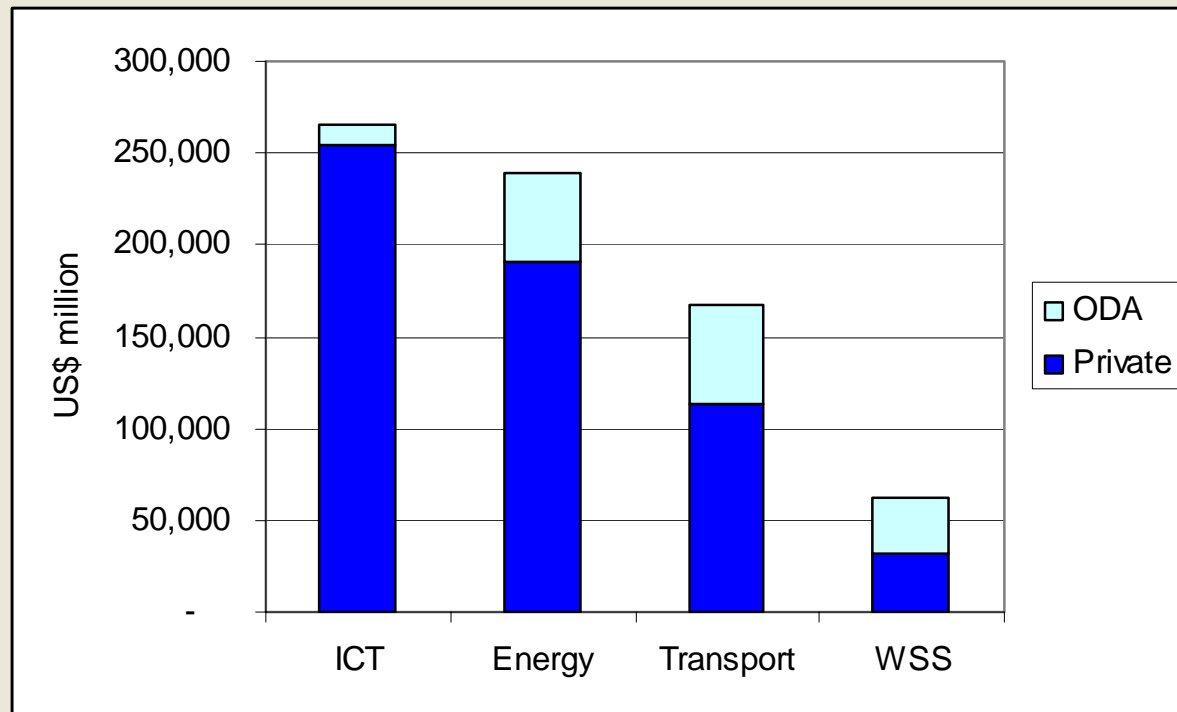


Figure by MIT OCW.

- Little debate that the association is positive
- But what drives what?

Part II: Water supply and sanitation as planning & investment priorities

ODA and private capital flows in developing countries, by sector, (1990-1999)



Sources: World Bank PPI Database (2001), OECD IDS Database (2001)

Average economic rates of return on World Bank-supported projects, 1974-92 (percent)

SECTOR	1974-1982	1983-1992
Irrigation and Drainage	17	13
Telecommunications	20	19
Transport	18	21
Airports	17	13
Highways	20	29
Ports	19	20
Railways	16	12
Power	12	11
Urban Development	...	23
Water and Sanitation*	7	9
Water Supply*	8	6
Sewerage*	12	8
Infrastructure Projects	18	16
All Bank Operations	17	15

... Not available

* Rates are financial, not economic, rates of return

Figure by MIT OCW.

- Economic rates of return are lower for W&S than for other infrastructure sectors: Why?

Moving W&S up the agenda

- Demonstrating willingness, ability to pay among users
- Educating users (creating demand) regarding links between water, sanitation, health, and poverty
- Mobilizing unserved households through partnerships with civic organizations
- Constitutional / human rights declarations?

