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
Part I: Goals of W&S investment

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
A: Public health benefits

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?

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 goals

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

<table>
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<th>Country</th>
<th>Haiti</th>
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<th>Peru</th>
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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’?
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)
### Economic rates of return are lower for W&S than for other infrastructure sectors: Why?

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

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<tr>
<td>All Bank Operations</td>
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* Rates are financial, not economic, rates of return

... Not available

Figure by MIT OCW.
II: W&S as planning priorities

Davis 2005

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?

![Graph showing percentage accepting per-person monthly change](Approximately per-person monthly change (US 1996 $))