Sustainability Societal Challenge Theme - The Challenge of Sustainable Water Futures Workshop
14th July 2011

Is it possible to universalize the access to ~~water and~~ sanitation services in poor countries?
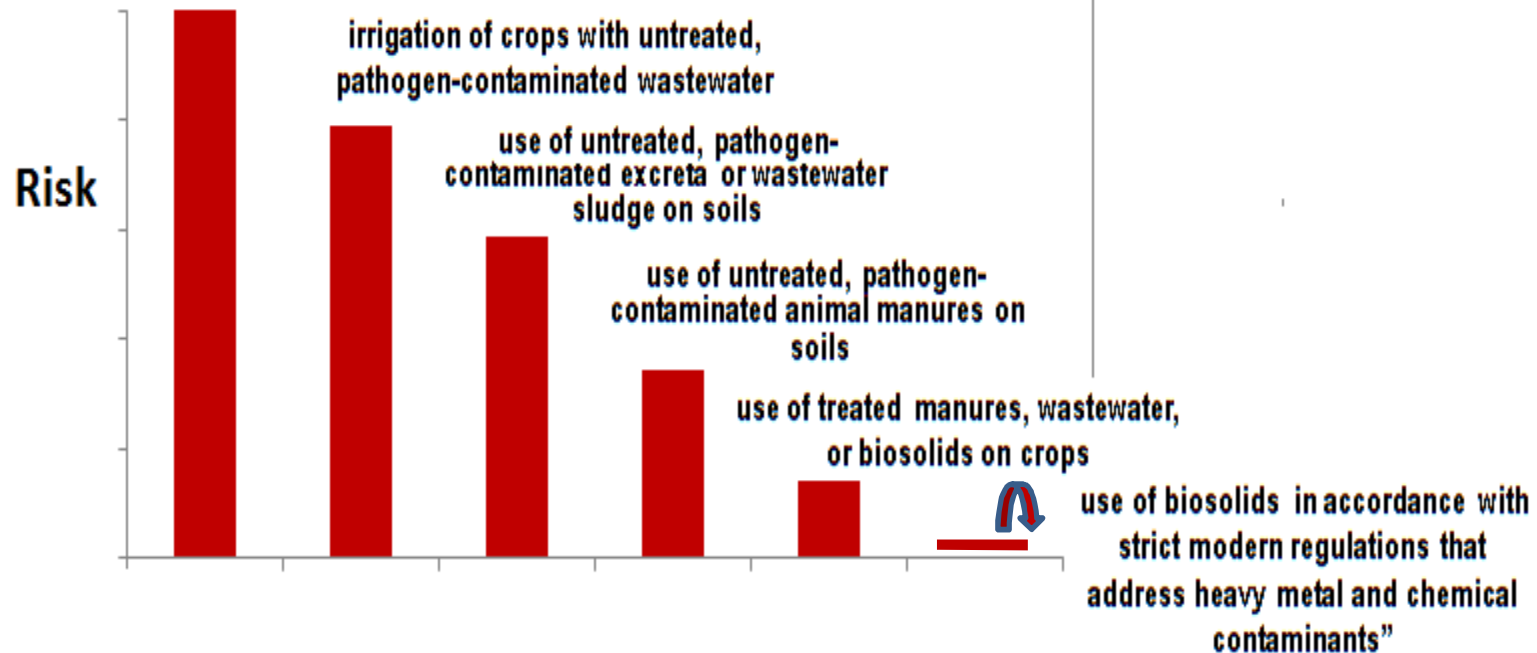
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SITUATION

Living in a dense community without basic sanitation

irrigation of crops with untreated, pathogen-contaminated wastewater

use of untreated, pathogen-contaminated excreta or wastewater sludge on soils

use of untreated, pathogen-contaminated animal manures on soils

use of treated manures, wastewater, or biosolids on crops

use of biosolids in accordance with strict modern regulations that address heavy metal and chemical contaminants"

Risk

LeBlanc et al., 2008

Some remarks about developing countries…..

" Are a wide variety of countries under different conditions

" Some "general" characteristics are

. Many are located in arid or semiarid regions, sanitation is hence linked to the lack of water

. Rely on agricultural for livelihoods

. Agriculture is an important share of the GNP, and hence water competition among rich and poor people is important

. Those in humid areas, sanitation is linked to the lack of water, sewers and treatment

Kibera Kenya

Baghdad, Iraq

IWRM (internationally)

˝ *"a process which promotes the coordinated development and management of water, land and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems."* Global Water Partnership

Operationally, involve :

✓ applying knowledge from various disciplines
✓ insights from diverse stakeholders (decision makers, sectors, users)
✓ Equitable and sustainable solutions
✓ Social and economic needs
✓ Protection of ecosystems and future generations water rights.
✓ Flexible process
✓ Technical limitation + social interests

The IWRM Planning Cycle

IWRM
in developing countries

˝ All the previously mentioned

+

. food security,

. job opportunities,

. increases in exportation,

. soil erosion control.

. Efficient use of water (less use, reuse and recycle (water + nutrients+?)

How far should we go for "Iwrm"?

IS COMPLEX TECHNOLOGY NEEDED?

Importance of technology on sanitation

˝   10% in episodes of diarrhea reduced by using simple technologies -

˝   In Egypt and Peru access to flush toilets reduced by 57-59% the risk of infant death

Luanda, Angola

DO WE NEED TO ADDRESS FIRST URBAN, RURAL OR SLUMS NEEDS ?

URBAN-RURAL

. One of the deepest disparities

URBAN

˝ Urban sanitation coverage is twice rural coverage.

˝ Is of 50% but this figure do not includes treatment which is at the most 15%

. 10% of wastewater worldwide ....*is treated* (80-90% in developing countries)
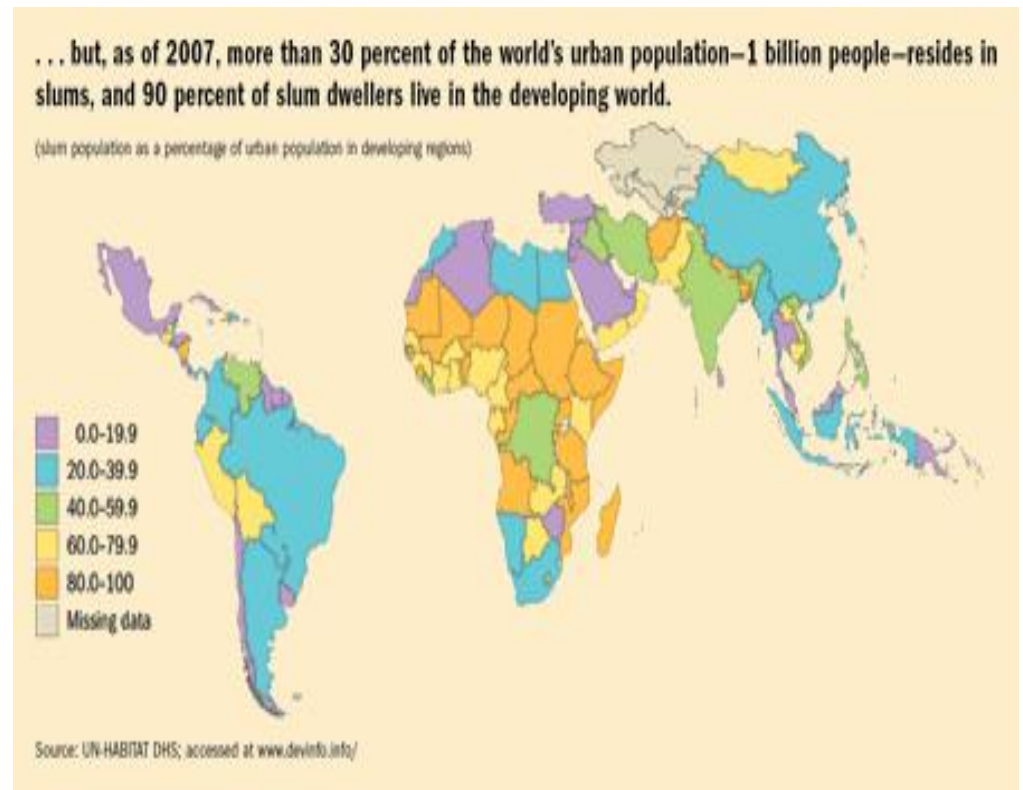
RURAL AREAS

˝ Linked to the lack of water service

˝ The main issue is feces disposal

˝ Services are more costly.

Addis Ababa, Ethiopia

Urban areas

″ A growing population, notably in urban areas and, within them, in slums

″ Lack of sanitation, particularly in vulnerable groups

. Vulnerability refers to lack of sanitation, climate change, economic voracity…..

″ The link poverty + lack of sanitation

… but, as of 2007, more than 30 percent of the world's urban population–1 billion people–resides in slums, and 90 percent of slum dwellers live in the developing world.

(slum population as a percentage of urban population in developing regions)

0.0-19.9
20.0-39.9
40.0-59.9
60.0-79.9
80.0-100
Missing data

Source: UN-HABITAT DHS; accessed at www.devinfo.info/

World urban growth rate: 1.78 %

Slum growth rate : 2.37 % in developing countries

Slum growth rate: 2.22 % in developed countries

Slums

˝ Are a challenge as this are densely populated areas in difficult conditions

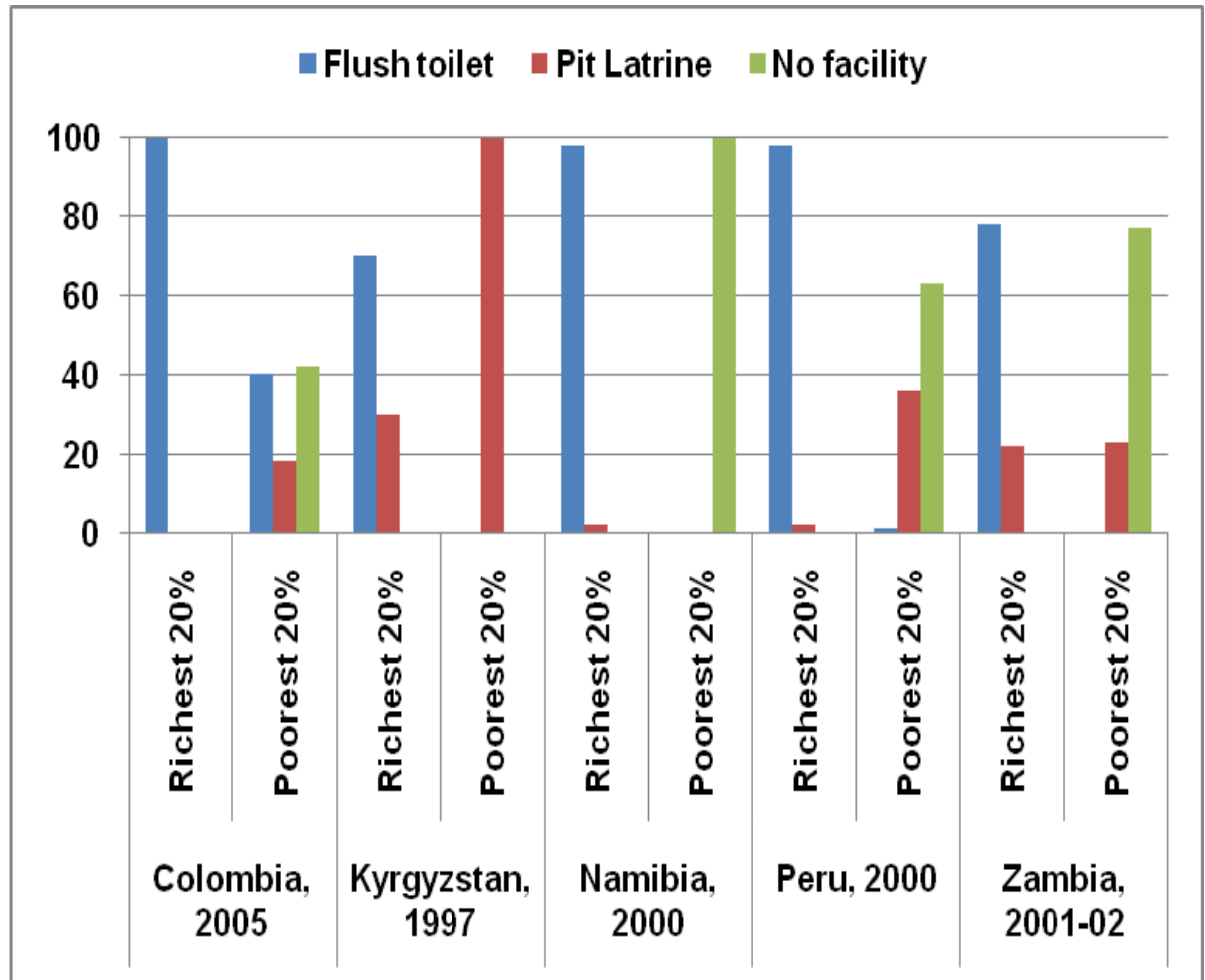

No. 4: Port au Prince, Haiti

Different Sanitation Services

Group differences.

Indigenous and non-indigenous

Minorities (castes and women)

Social classes.

Not only on coverage but as well on the technology used

Middle-income regions

″ Have increased access to services (water service)

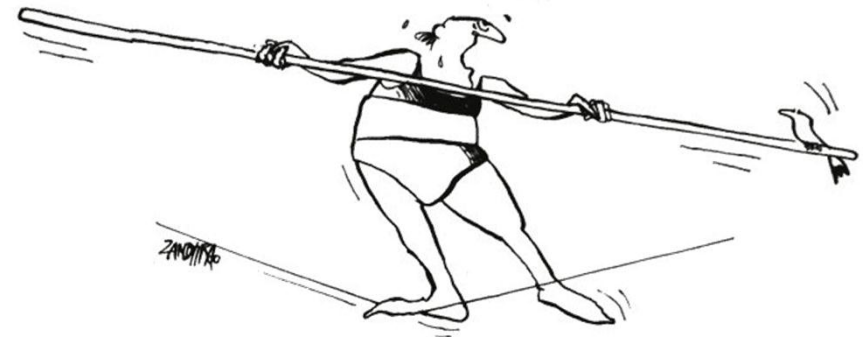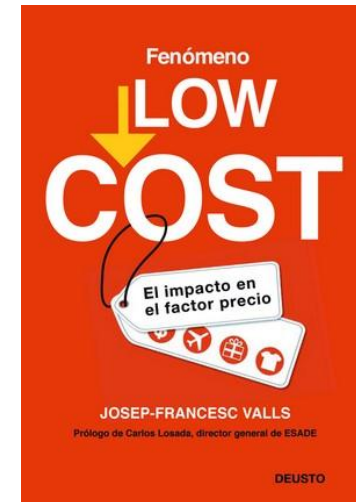″ People have been exposed to conventional sanitation options and therefore demand the same quality of service

Mumbai, India

Is there need to have different technology for sanitation in developing countries?

*Are we solving the same problems?*

Technology for Sanitation

✓ Treatment with High Efficiency + Low cost

✓ **Robust** treatment methods that, under the precarious conditions of low income regions, are capable of producing reliable results

✓ Combine treatment options + other intervention methods

Jimenez, B. (2009) **Pathogens of concern in dry toilets from developing countries and risk of using the sludge produced in agriculture Preconference workshop Safe and Sustainable Sanitation, August 10-12, Tampere ,Finland**

Issues to Address

˝ the proper management of sludge and excreta, two byproducts often not considered as part of sanitation targets
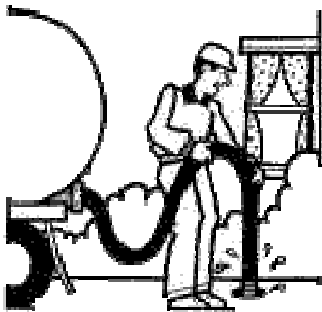

India, 2007. A group of scavengers, including a 14-year-old boy, fully engaged with their every day usual work of cleaning the human excreta from the septic tank of public toilets. Photo: Senthil Kumaran/Trikaya Photo

http://sanitationupdates.wordpress.com/2011/04/04/the-wellcome-trusts-dirt-season/

Developed vs developing countries

. Through experience, research, and technological innovations have progressively improved their sanitation services.

. In a context where other needs have been fulfilled

. Are the sanitation problems that have faced been the same?
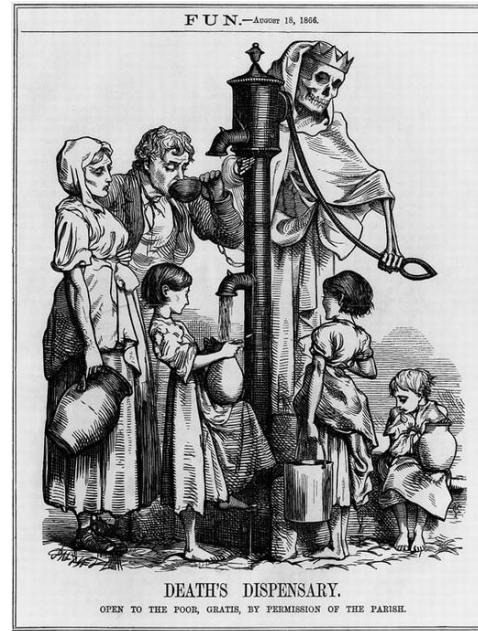
IS IT AN ECONOMIC PROBLEM?
IF SO, WHICH TYPE?

Investments from 1990-2000

˝ Orientated to
 . water supply
 . Cities
˝ ¼ for sanitation and mostly in sewered (part of) cities
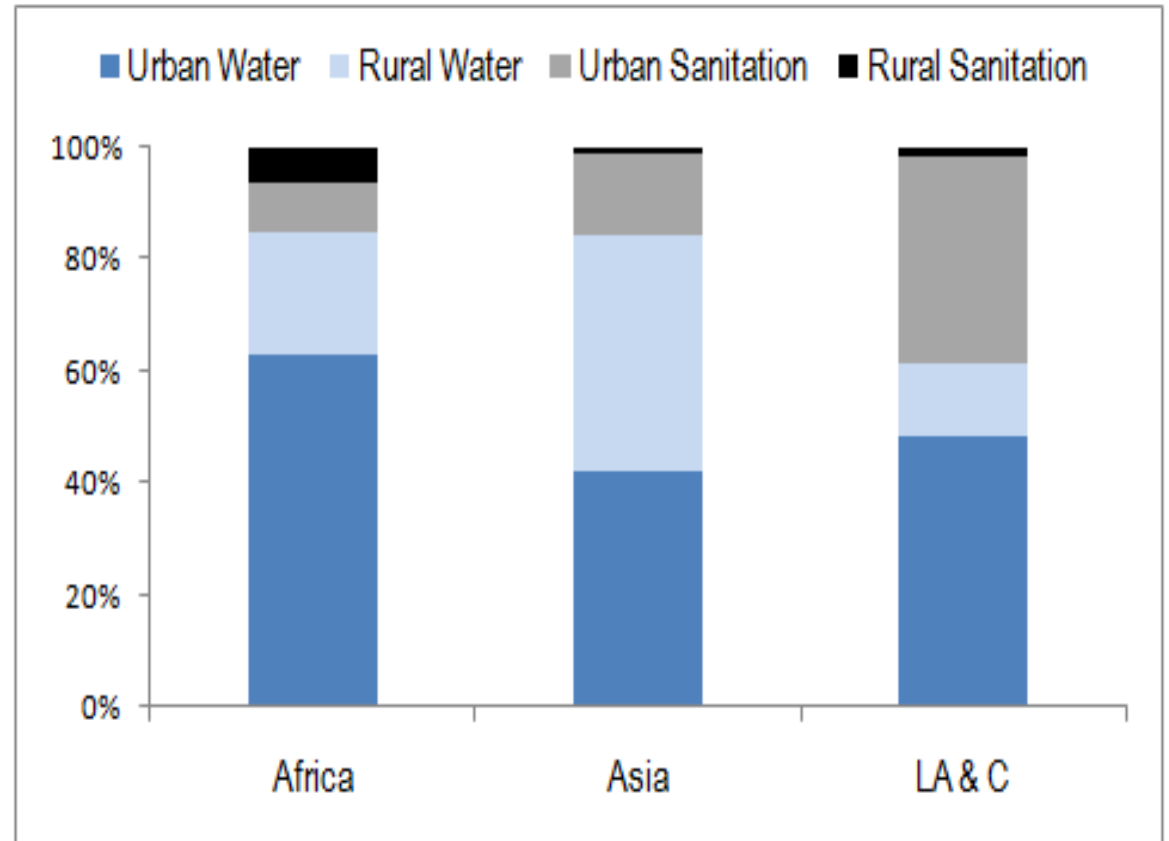
WHO/UNICEF, 2000

Sanitation Costs

˝ To meet the water MDG for sanitation (reducing by half)

- . A total of $101 billion, representing an annual average investment of $6.7 billion
- . $68 billion for the water supply
- . $33 billion (mean figures but values ranging $24 - $42 billion) for sanitation

˝ Each year

- . Europe and the United States spend $17 billion on pet food
- . Europe spends $11 billion on ice cream

Cost-benefit analysis
WHO (2004)

˝ 1 USD = 3-34 USD economic return, depending on the <u>region and the type of technologies used.</u>

Analysis of costs calculation

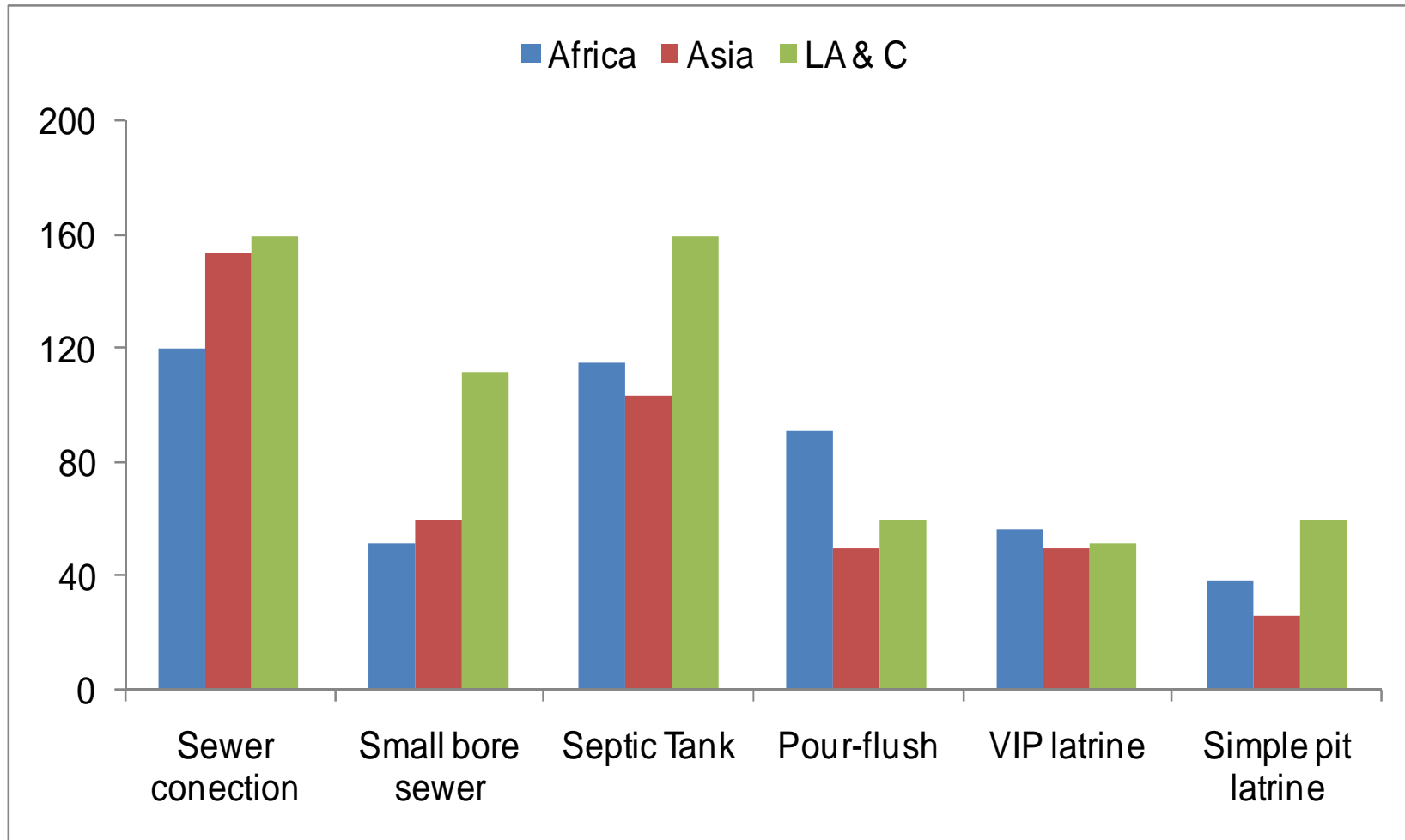″ No reference costs, as exist (?) in developed countries.

USD per m3 of wastewater
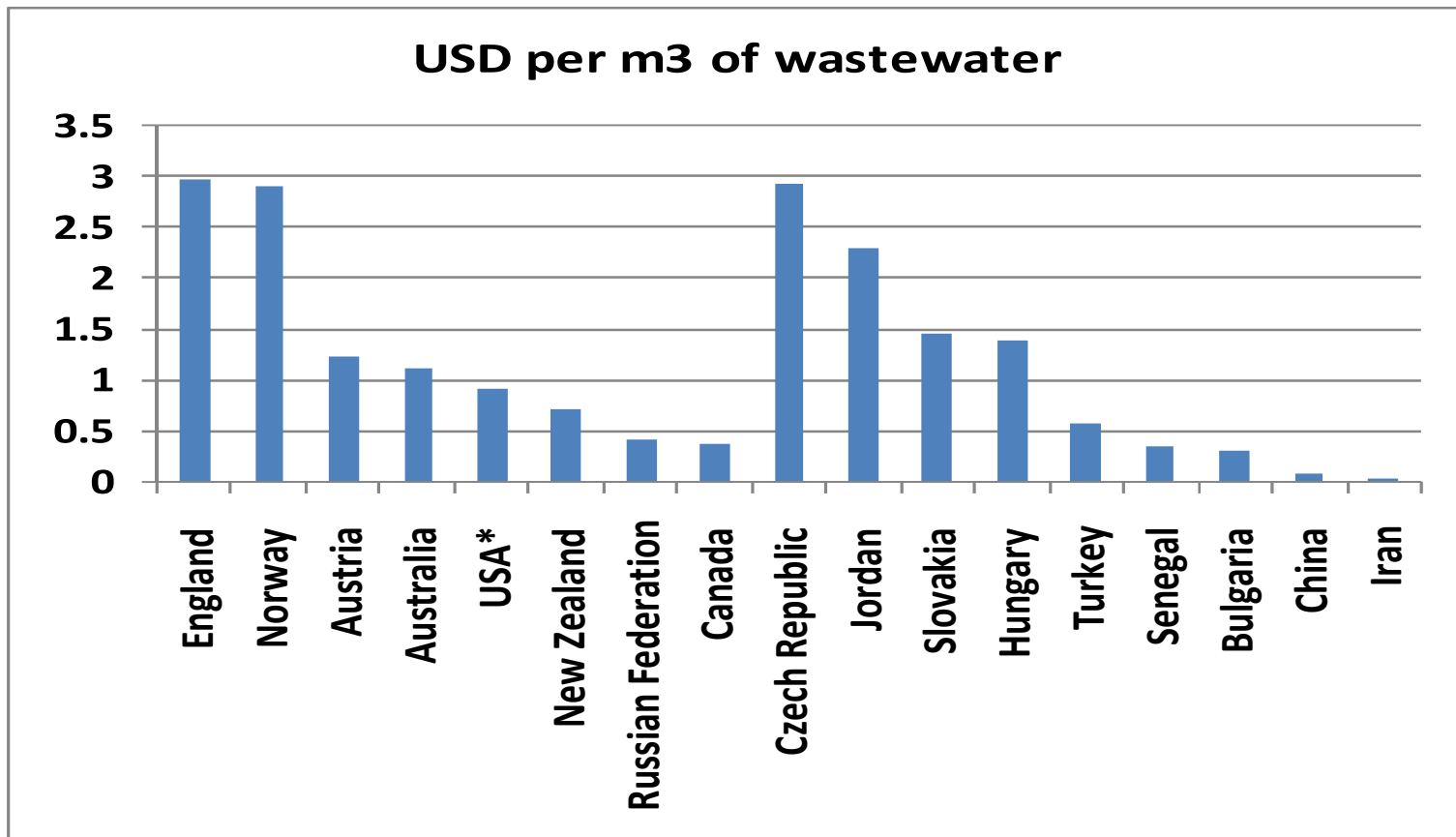
Countries with high sanitation coverage

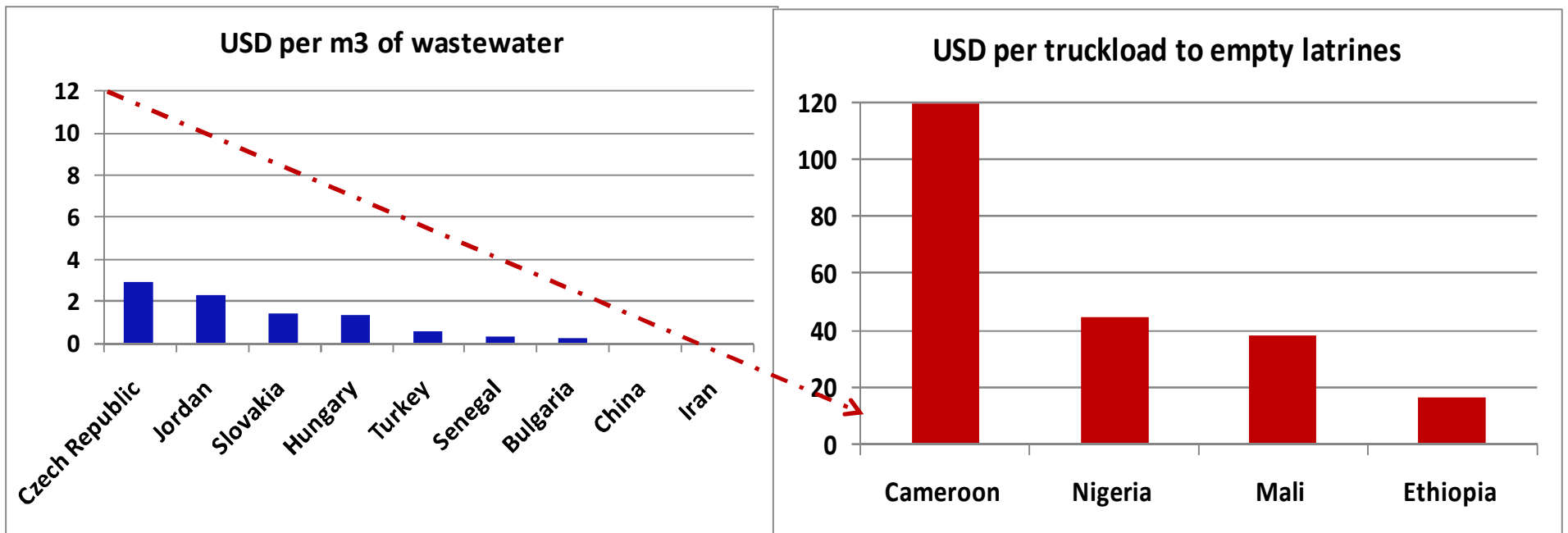**Countries with low sanitation coverage**

″ As result

. bids costs are established using international data (?)

Mean construction costs (1990-2000)

differences not only for facilities but
also for fuel and electricity costs

USD per m3 of wastewater

Czech Republic, Jordan, Slovakia, Hungary, Turkey, Senegal, Bulgaria, China, Iran

USD per truckload to empty latrines

Cameroon, Nigeria, Mali, Ethiopia

cost of emptying on-site sanitation systems is not negligible (not considered frequently)

SUMMARY

˝ IWRM, how far?

˝ Technology complex/simple, robust/low cost?

˝ Do we need to address urban, rural or SLUMS needs first?

˝ Are we solving the same problems?....if so technology should be the same

˝ Is it an economic problem?
If so, which type?

References

˝ Jiménez Cisneros B. (2011) Safe sanitation in Low Economic Development Areas, Treatise MS 82. In: Peter Wilderer (ed.) Treatise on Water, Science, vol. 4, pp. 147–201 Oxford: Academic Press.