

# What Role Can Economic Analysis Play in WASH Decision Making?

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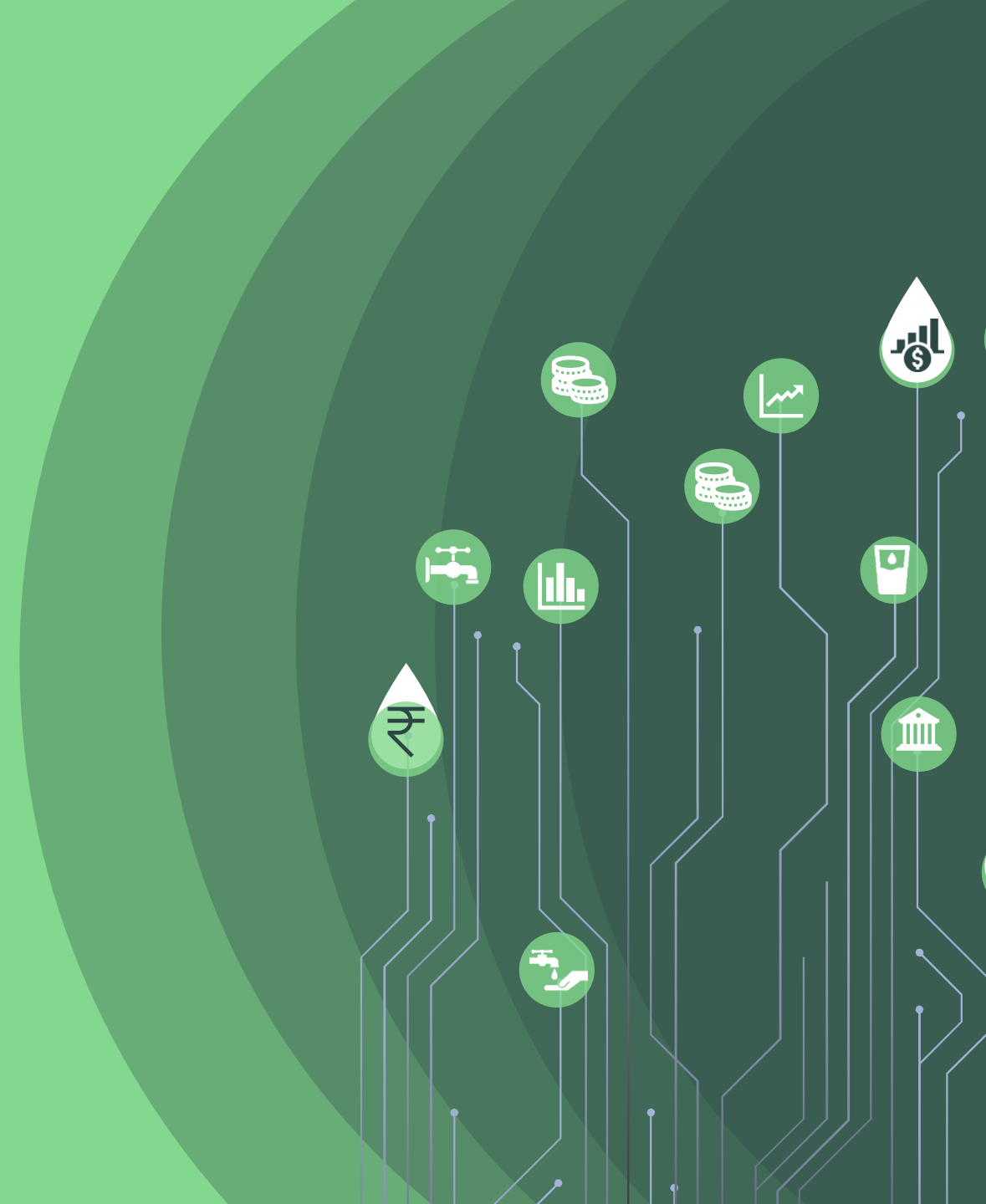
**CWAS**  
CENTER FOR WATER AND SANITATION  
**CRDF** CEPT UNIVERSITY

**CEPT**  
UNIVERSITY  
FACULTY OF PLANNING

**IFS** Institute for Fiscal Studies

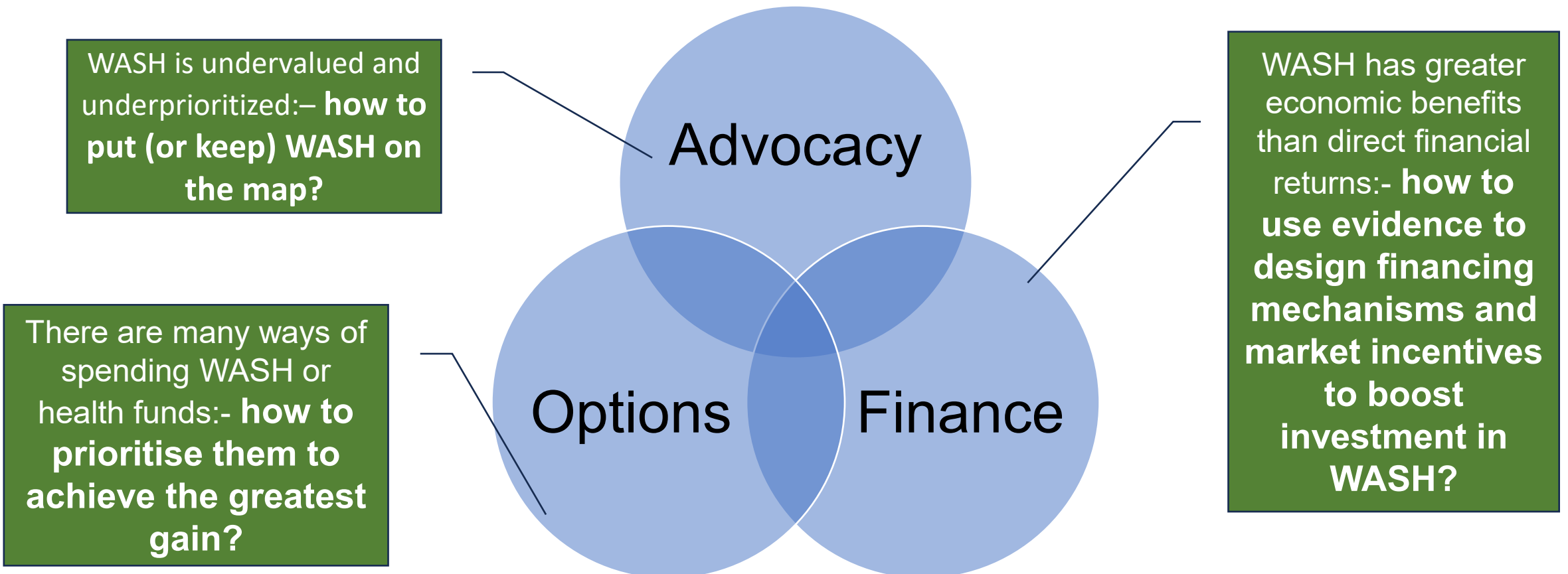
LONDON SCHOOL OF HYGIENE & TROPICAL MEDICINE

Gates Foundation



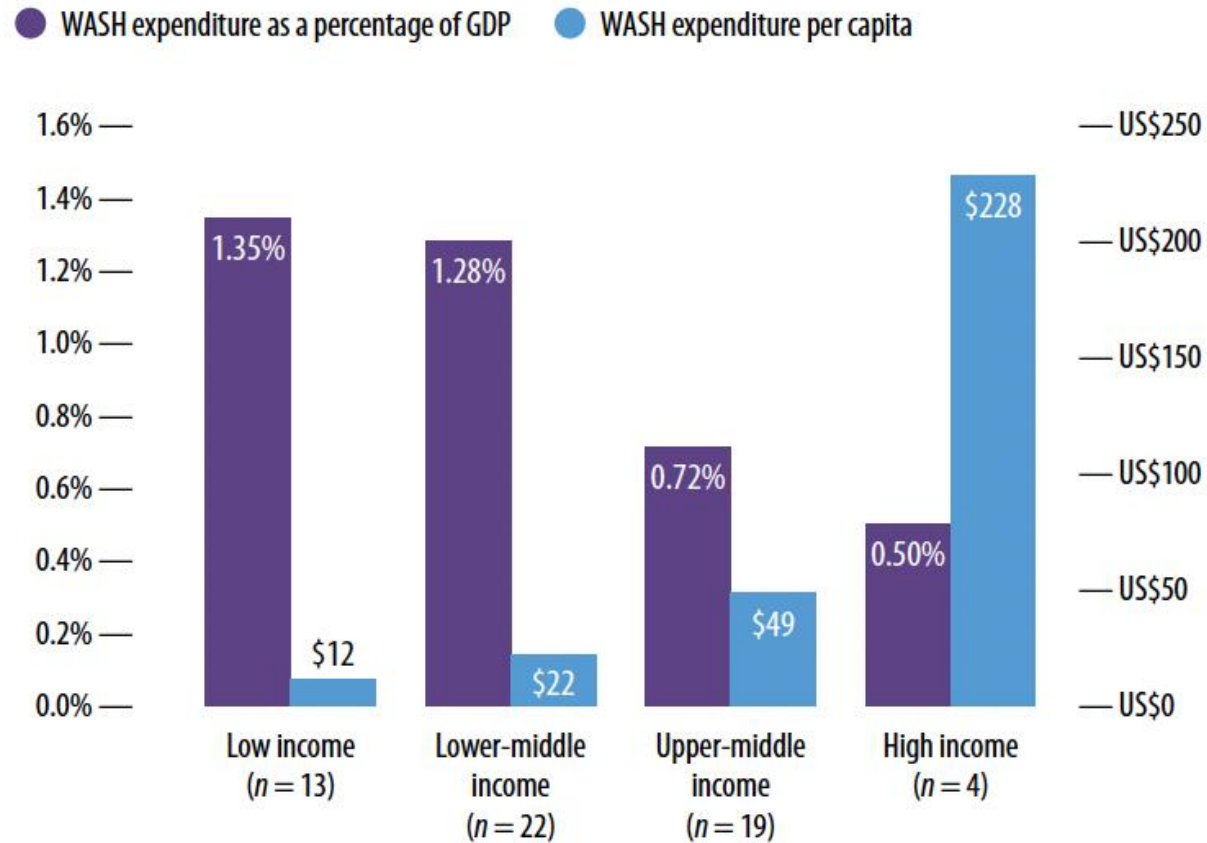
# How Can Economic Analysis Be A Decision-Making Tool?

This talk covers three related uses of WASH economics, noting the interdisciplinary nature of each one



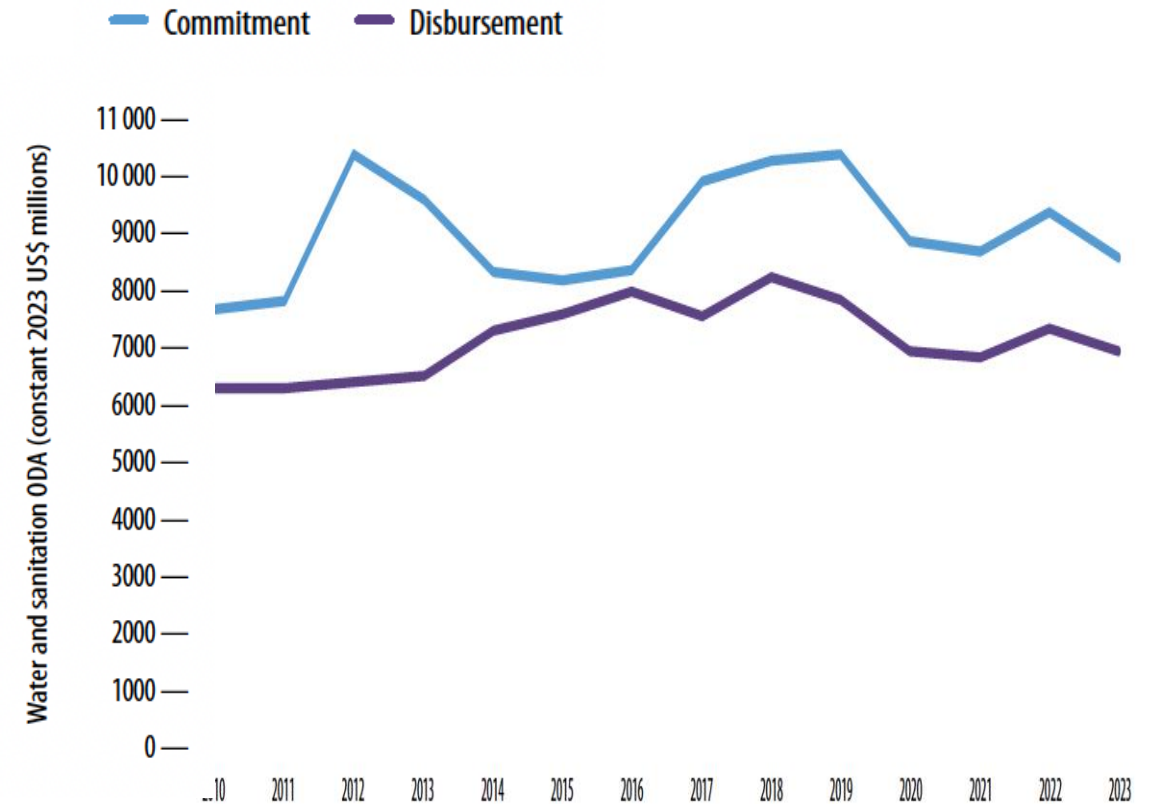
# Part 1. The Need for Continued WASH Advocacy

Total WASH expenditure is well below the investment needs



Source: GLAAS 2024/2025 country survey.

Donor contributions are declining in real terms



Source: OECD-CRS, 2025.

# To Obtain the Most Funds for WASH, Messages Need to Reach a Range of Audiences

- WASH contributes to economic growth => **Ministry of Finance**
- WASH is essential for gender equality => **Ministry of Gender**
- WASH reduces child death and stunting => **Ministry of Health, M of Education**
- WASH saves government spending => **Ministry of Finance; Line Ministries**
- WASH markets create jobs => **Ministry of Labour**
- WASH wins votes => **Parliamentarians, Mayors, etc.**
- WASH attracts foreign tourists => **Ministry of Tourism**
- WASH is a human right => **High Courts, communities and households**
- WASH contributes to resilient societies => **Climate Ministries**

All these messages need to be backed by **evidence**

# Advocacy by ‘Knowing the Cost’ of Reaching Targets

- WASH can be better advocated for when you have done the maths on ‘what it takes’
- WASH line ministries have been weak at making the case
- The SDG WASH Costing tool has been promoted by SWA and used in >40 countries
- However, it is crude and should not be a substitute for a national investment plan

DATA VERIFICATION SHEET RESTORE DEFAULT VALUES

STEP 1: SELECT COUNTRY --> **Kenya**

STEP 2: SELECT BASEYEAR --> **2024**

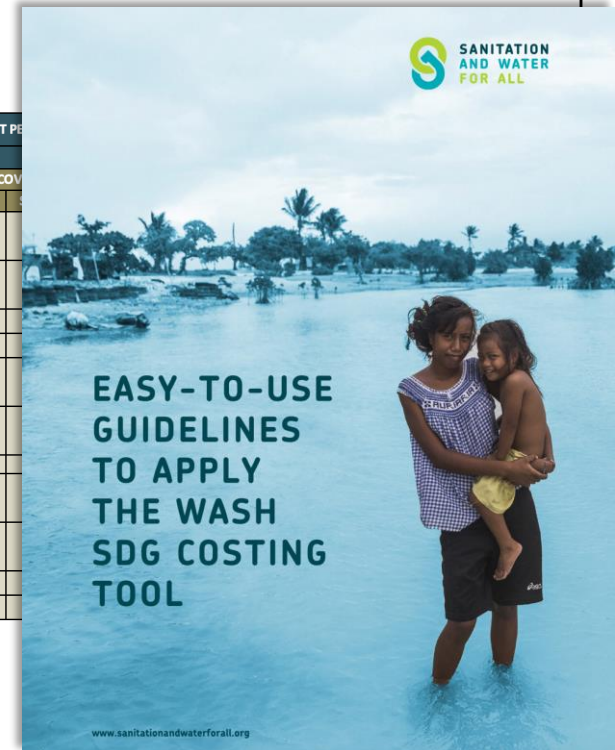
STEP 3: VERIFY AND ADJUST COUNTRY DATA BELOW

Please verify the data below and, if deemed necessary, adjust these figures to reflect country level data by deleting the formula and entering a revised figure. Instructions are provided in INTRODUCTION sheet.

The cells in the table are colour coded according to the variable type, as follows:

TECHNOLOGY
COVERAGE LEVEL IN BASELINE YEAR
COVERAGE IN TARGET YEAR
COSTS
COST RECOVERY
DISCOUNT RATE
LOCAL CURRENCY EXCHANGE RATE

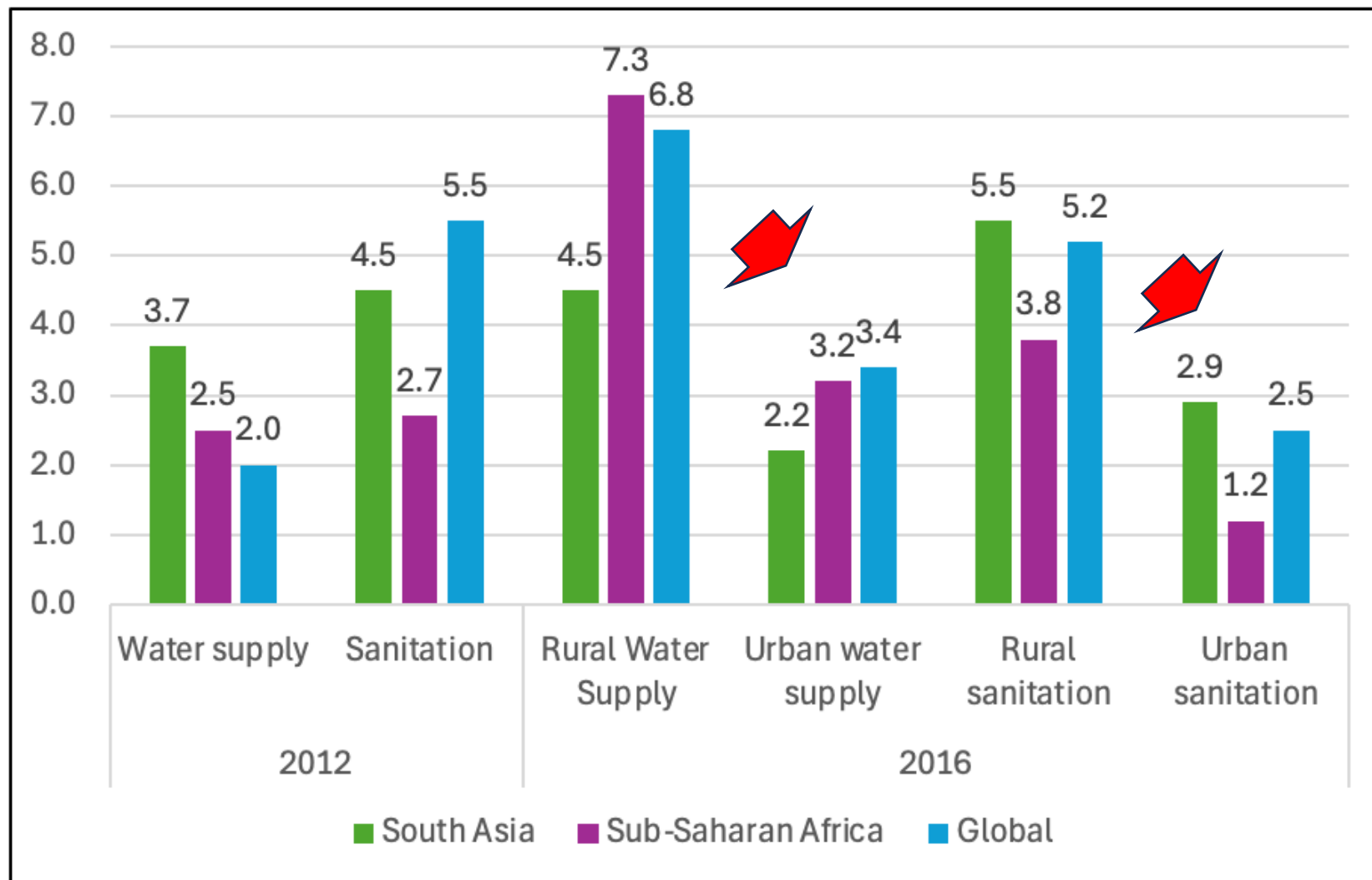
SERVICE	RURAL / URBAN	TECHNOLOGY	HOUSEHOLDS WITH TECH. OPTION	SERVICE COVERAGE LEVEL BASELINE YEAR	SERVICE COVERAGE LEVEL TARGET 2030	FINANCIAL COST PER UNIT			
						CAPITAL COSTS (TOTAL)			COST RECOVERY
						CapEx	Software	Duration	
Basic Water	Urban	Tubewell	50%	69%	100%	62.5	3.1	-20	20%
		Dug well	50%	69%	100%	29.8	1.5	-10	20%
	Rural	Tubewell	50%	49%	100%	42.8	2.1	-20	20%
		Dug well	50%	49%	100%	8.1	0.4	-10	20%
Safely Managed Water	Urban	Safely managed water	100%	31%	100%	116.1	11.6	-20	20%
	Rural	Safely managed water	100%	4%	100%	43.9	4.4	-20	20%
Basic Sanitation (onsite only)	Urban	Septic tank	50%	40%	100%	671.0	134.2	-20	20%
		Pit latrine	50%	40%	100%	43.6	4.4	-8	20%
	Rural	Wet pit latrine	50%	35%	100%	43.6	4.4	-8	20%
		Dry pit latrine	50%	35%	100%	24.4	4.4	-8	20%
Any fixed point defecation	Rural	Any latrine, including unimproved	100%	85%	100%	24.4	2.2	-2	20%
Safely Managed Sanitation (fecal sludge management or sewerage only)	Urban	Sewerage with treatment	50%	32%	100%	158.6	15.9	-20	20%
		Septic tank with treatment (FSM)	50%	32%	100%	70.3	7.0	-20	20%
	Rural	Pit latrine with treatment (FSM)	50%	34%	100%	56.3	5.6	-20	20%
		Sewerage with treatment	50%	34%	100%	392.1	39.2	-20	20%
Handwashing with soap	Urban	Station with soap and water	100%	13%	100%	8.7	15.4	-6	20%
	Rural	Station with soap and water	100%	7%	100%	1.1	7.5	-10	20%
DISCOUNT RATE ( > 0% )		5%							
LOCAL CURRENCY PER US\$		1.0							
CURRENCY (SHORT FORM)		USD							



<https://www.sanitationandwaterforall.org/tools-portal/tool/sdg-costing-tool>

# Advocacy Using Cost-Benefit Analysis

- We have >20 years of CBA evidence
- Later CBAs revealed differences between rural and urban areas
- Changes over time, accounted for by:
  - Declining mortality
  - Change in valuation method / assumptions
  - Changes in health impacts
  - Different unit costs
- **Unit costs incurred are assumed to lead to sustained coverage**



WHO, 2012; Lomborg et al, 2018

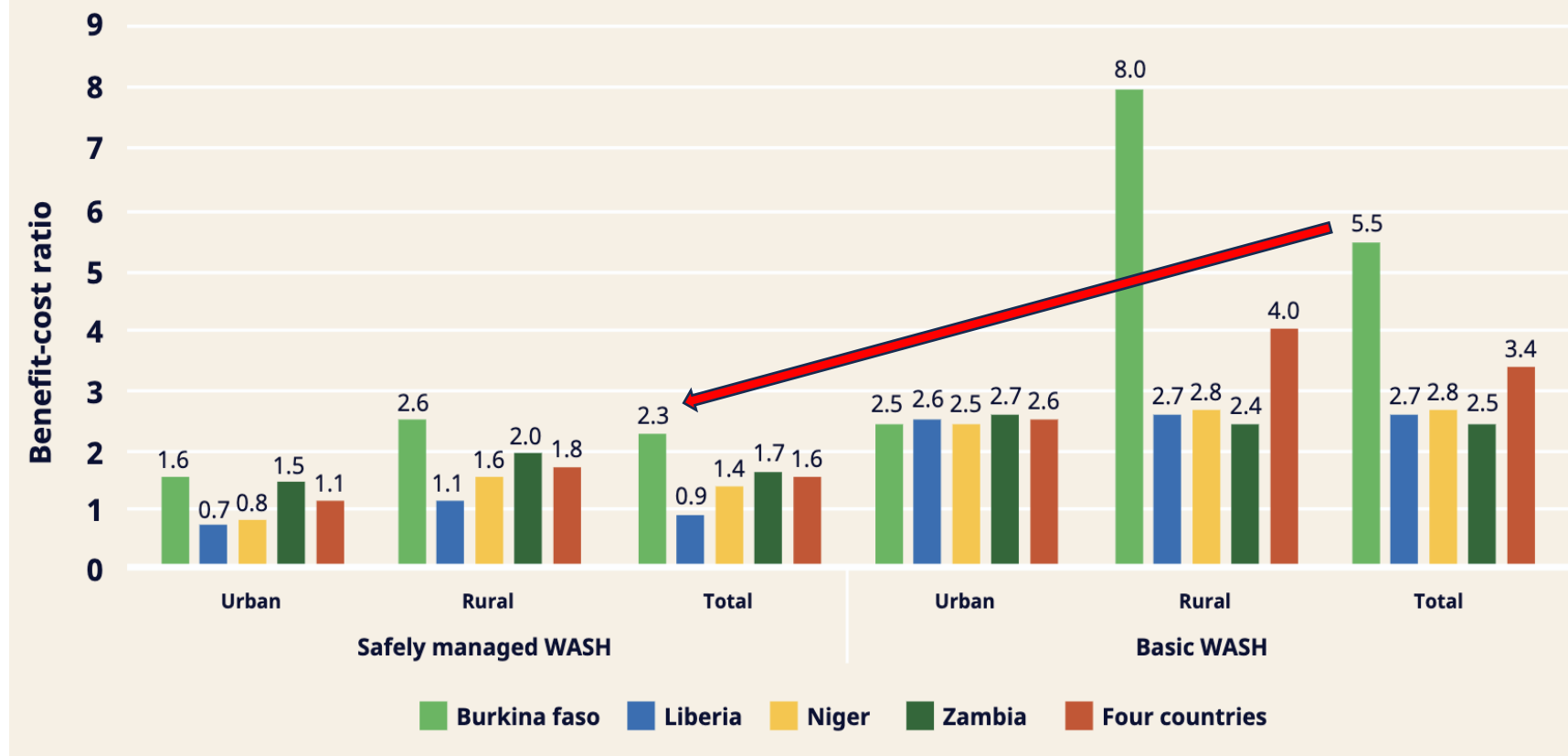
# Advocacy Using Country CBAs

WaterAid's 2026 report shows a decline in BCRs as we move to 'safely managed'

Differences between countries - explained by contextual factors - raises questions on generalizability

We need better evidence fully assessing the benefits of SMS

Figure A. Benefit-cost ratios of safely managed and basic WASH services.



WaterAid, 2026

# Advocacy Using Country CBAs

UNICEF shows that in India societal BCRs can exceed 4.0 if universal usage is reached

This declines to 3.1 at usage of 85%

Financial (cash) perspective can lead to a BCR > 1.0 for households

Benefit-Cost Ratio

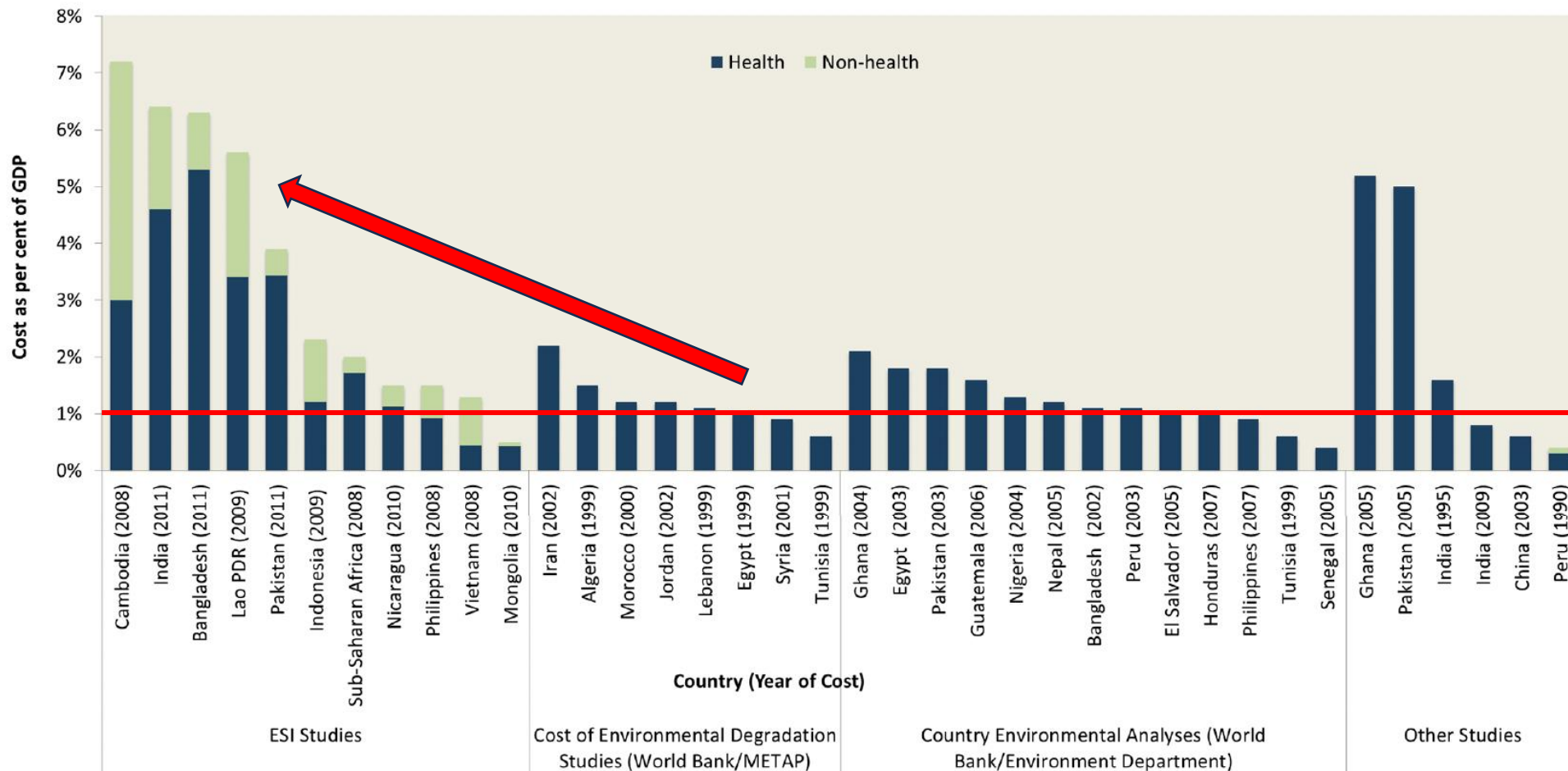


UNICEF, 2018

# Cost of Inaction Studies

From early 2000s, the World Bank has led several initiatives quantifying economic losses from poor water/sanitation – most studies show impacts >1% of GDP

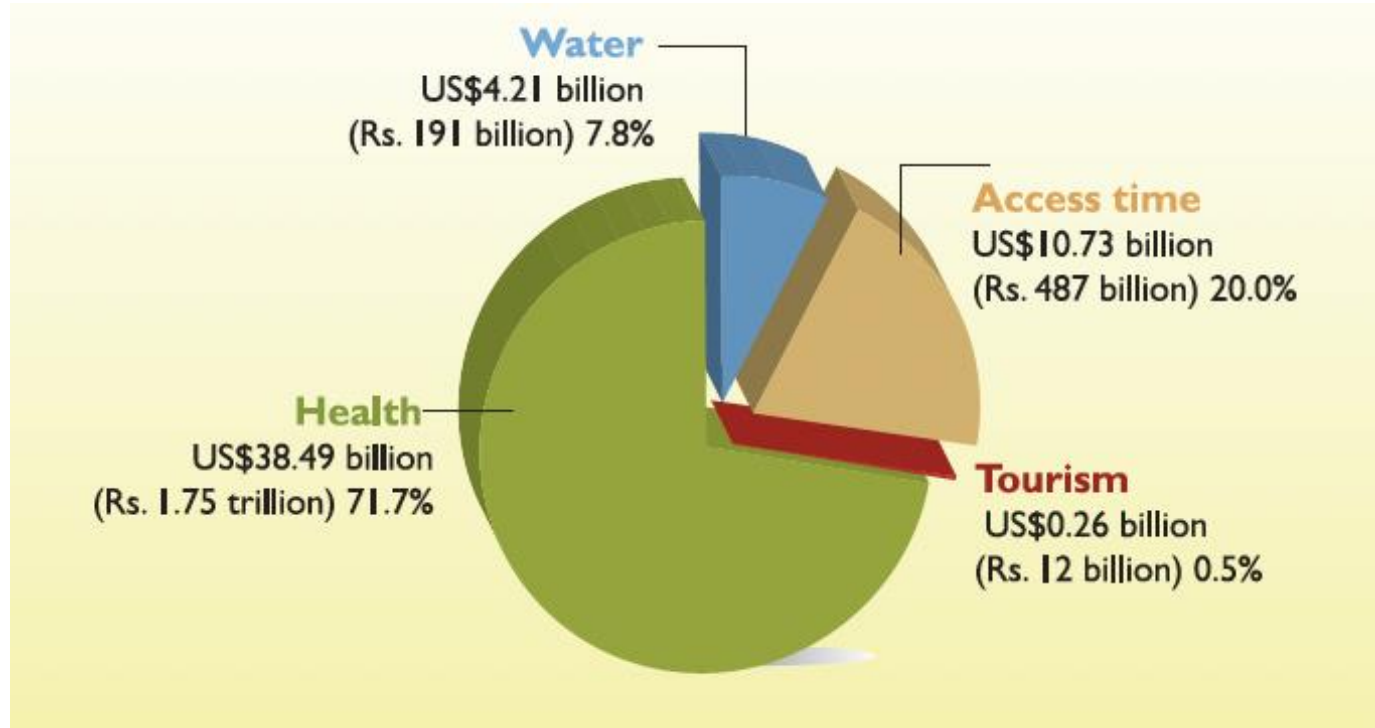
Costs of inaction increased when a broader range of health impacts were included as well as non-health impacts



Hutton & Chase, 2016

# Cost of Inaction Studies

In India, the economic impacts of poor sanitation were estimated to be US\$5.3 billion, equivalent to 6.3% of its GDP in 2006



**THE ECONOMIC IMPACTS OF INADEQUATE SANITATION IN INDIA**

**Inadequate Sanitation Costs India Rs. 2.4 Trillion (US\$53.8 Billion)**

**wsp** water and sanitation program | **ADB** | **Australian Government AusAID** | **UKaid** from the Department for International Development

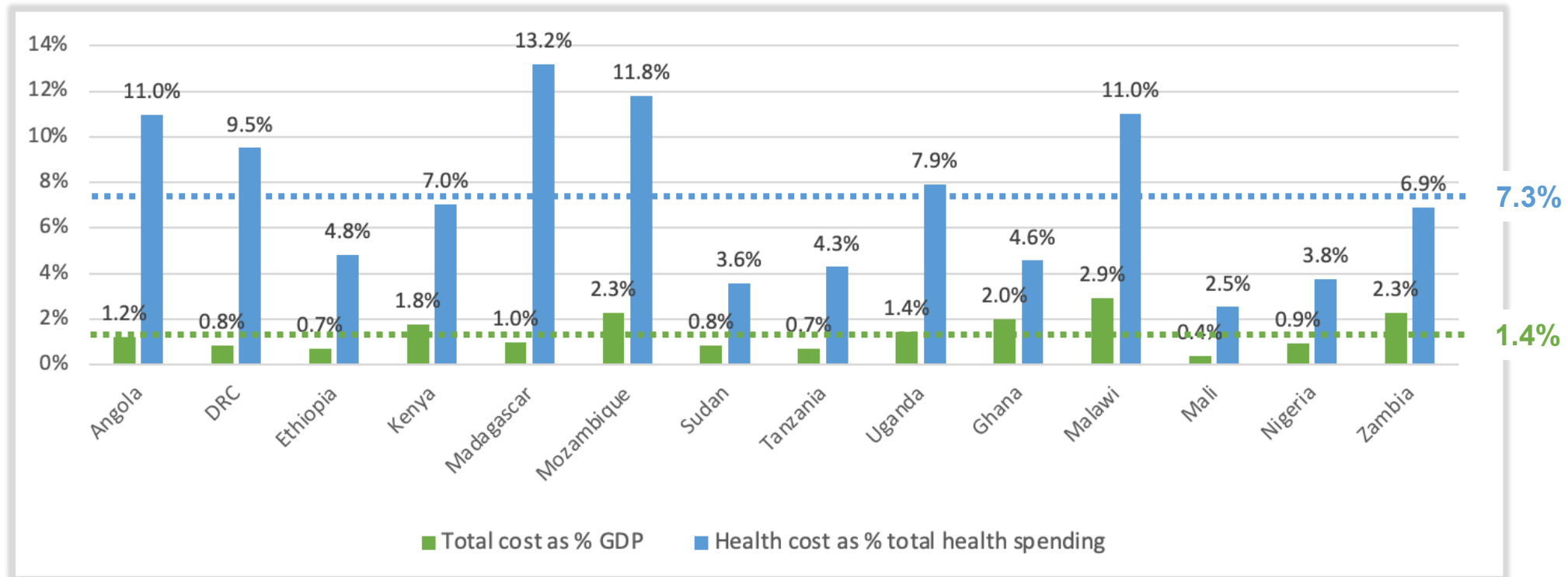
World Bank, 2011

# Cost of Inaction at the Health System Level

The World Bank and WaterAid estimated the costs of healthcare-associated infections (HAIs) in 14 African countries

Costs of HAIs averaged 1.4% of GDP

Medical costs averaged 7.3% of annual healthcare spending



Hutton et al, 2024

Much more advocacy is needed, using such figures, to more fully put WASH+ on the HCF map

# Conclusions on Evidence for WASH Advocacy

- Overall, studies are done infrequently, and only when a specific development partner sees an opportunity to create momentum for WASH with new evidence
- There is limited common planning among development partners to agree what is needed and how studies will be implemented and funded
- Therefore, studies lose their relevance after a few years, and are rarely redone
- Given the usefulness for countries themselves, shouldn't there be international efforts to repeatedly update key estimates?

# Part 2. The Need for Comparative Analyses to Select WASH Interventions

There are many ways of spending WASH or health funds:- how to prioritise them to achieve the greatest gain?

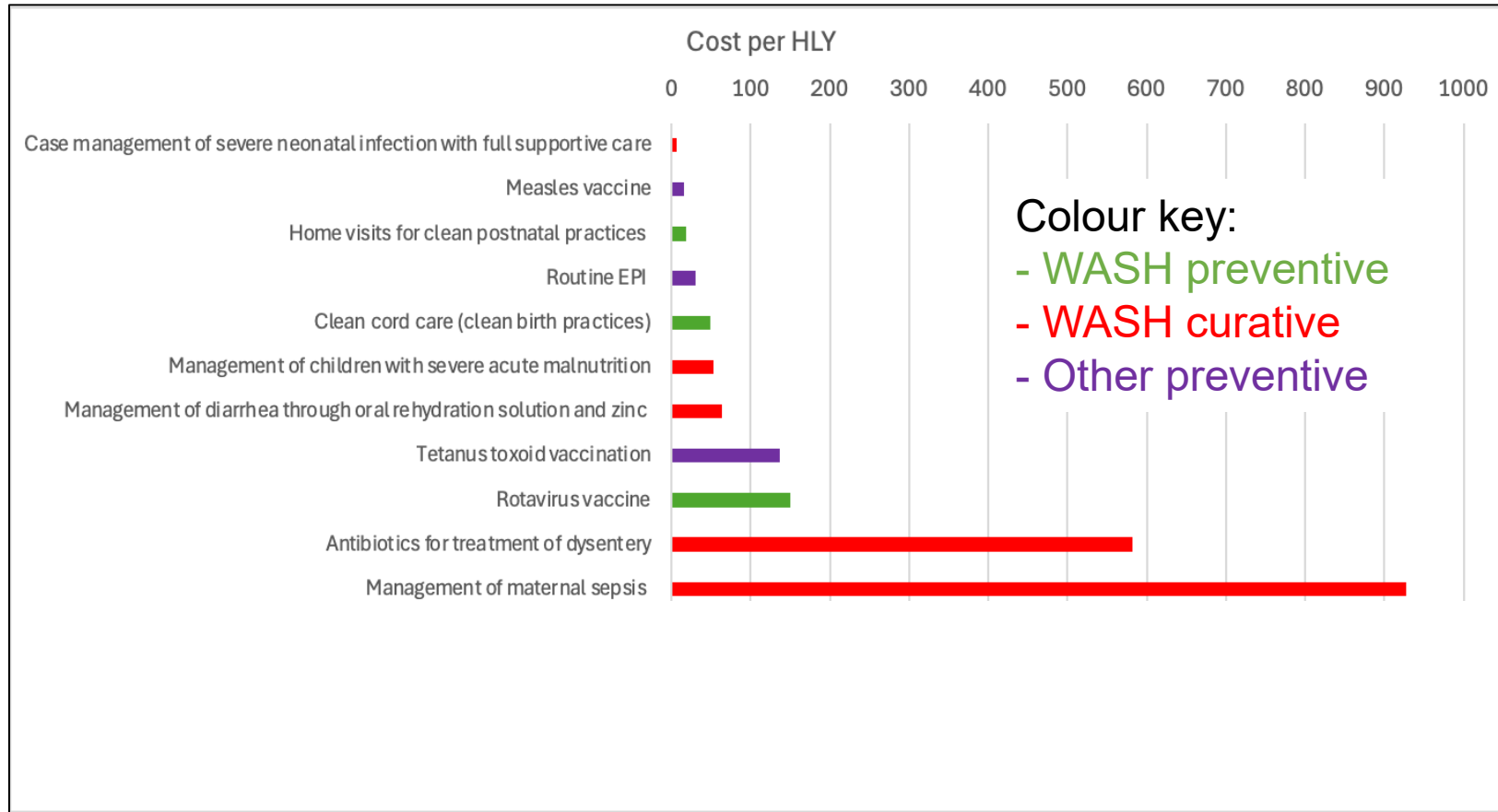
The method and metric used depends on who will use the evidence, and what you are trying to maximise, for example:

- Health => **cost-effectiveness league table (e.g., cost per DALY)**
- Ministry of Finance or overall society => **cost-benefit league table**
- Line Ministry for water / sanitation => **unit cost per person reached at a given service level**
- Environmental => **greenhouse gas emission comparison or water pollution caused**

How has WASH fared with these?

# Cost-Effectiveness League Tables

Since the early 2000s, the World Health Organization has used a standard method (WHO-CHOICE) to estimate cost-effectiveness ratios across a large range of health interventions



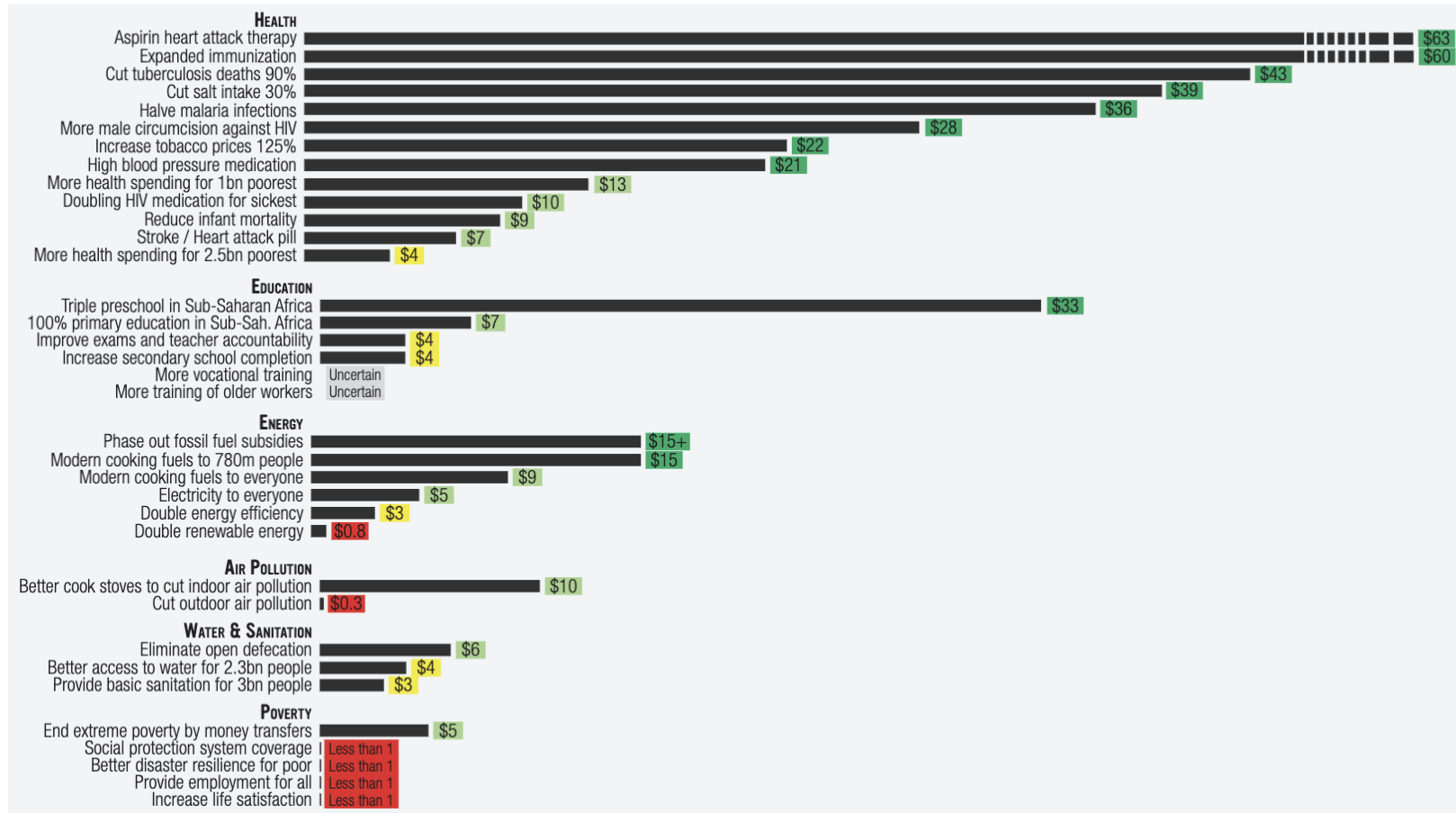
However, even recently, facility-based and community WASH preventive interventions are largely omitted.

Given WASH has many non-health benefits, priority should not be decided using these league tables alone

Stenberg et al, 2021.

# Cost-Benefit League Tables

In preparation for the SDGs, the Copenhagen Consensus Center produced the “Nobel laureates guide to the smartest targets for the World 2016-2030”



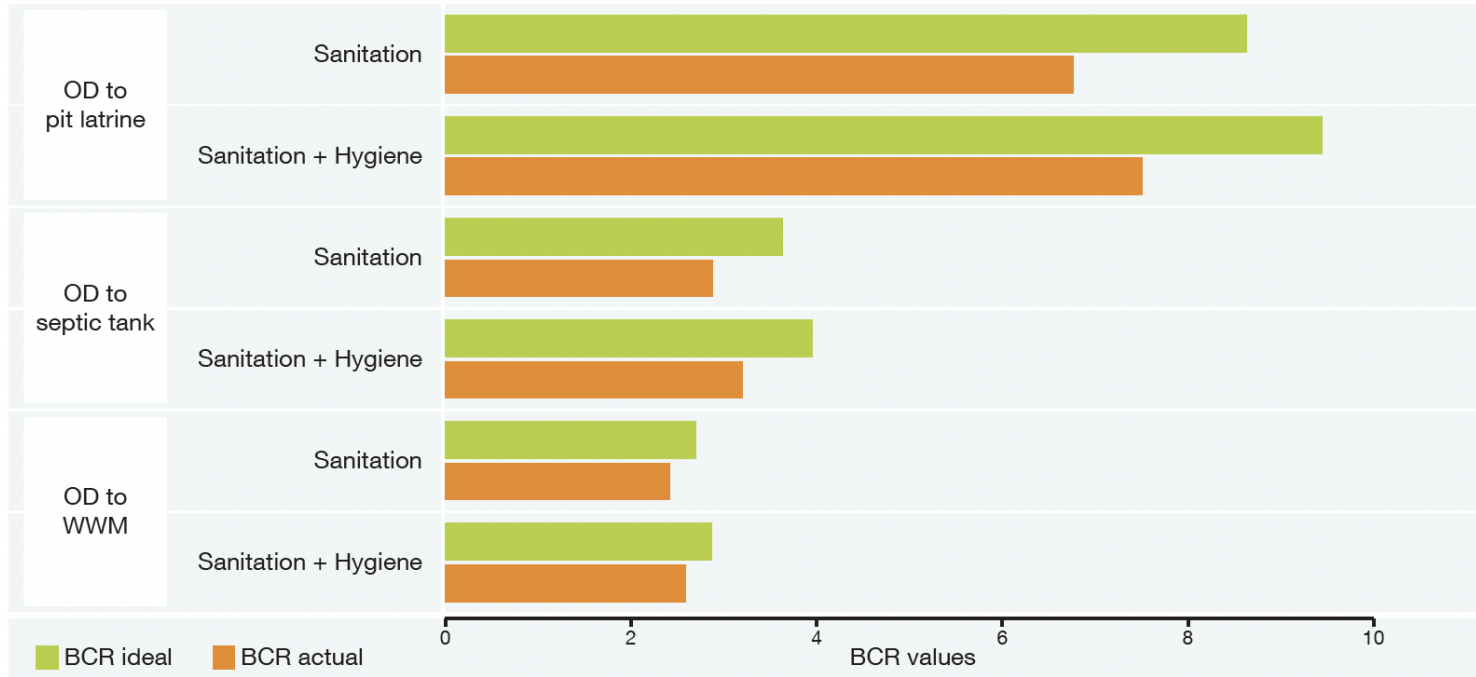
Excerpt from Lomborg, 2015

- Common methods used for valuation (e.g., \$1,000 per DALY saved)
- Challenge of comparing very different development topics with different benefit quantifiability
- WASH did not rank in top interventions, although fighting malnutrition did (though WASH excluded)

# Cost-Benefit Analysis for Selecting Options

In 2012, World Bank published comparative cost-benefit analyses of alternative sanitation interventions for rural and urban areas in 6 Southeast and East Asian countries

## Vietnam: urban sites



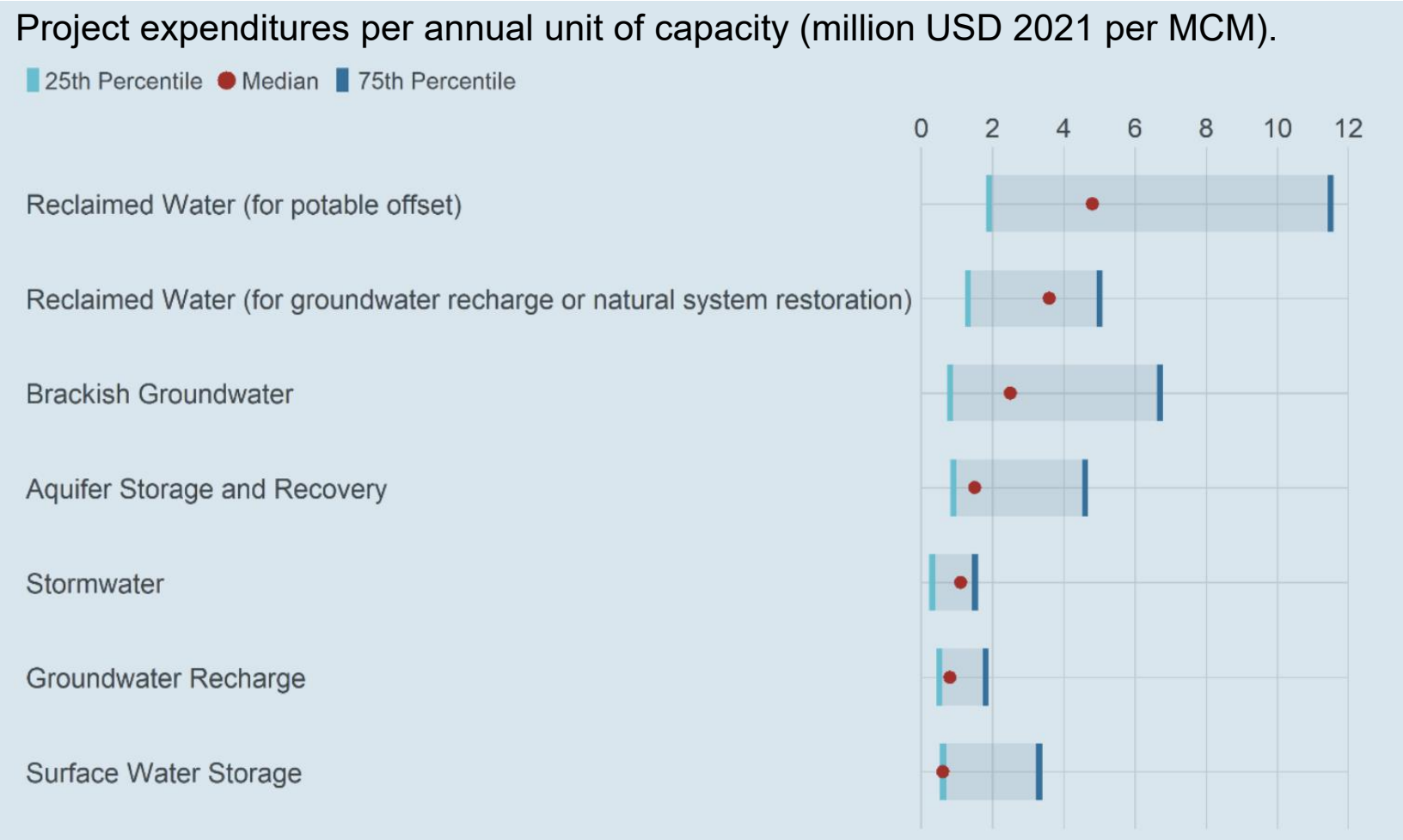
Key: WWM - wastewater management

World Bank, 2012

- BCR differences largely driven by unit costs
- Health benefits dominate
- Environmental benefits challenging to evaluate
- 'Intangible' impacts not monetized
- Some sanitation options hard to evaluate benefit differences

# Water Unit Cost Comparison

In Florida, USA, costs have been estimated for boosting water supply



Just using unit costs alone, the most economic options can be identified

Unit cost databases are usually not maintained, although in many countries there are benchmarks for public procurement

Use of cost data affected by major cost variations between contexts

Tran et al, 2023

# GHG Emissions from Sanitation Interventions

More studies now compare GHG emissions for different sanitation options – e.g., of Kampala

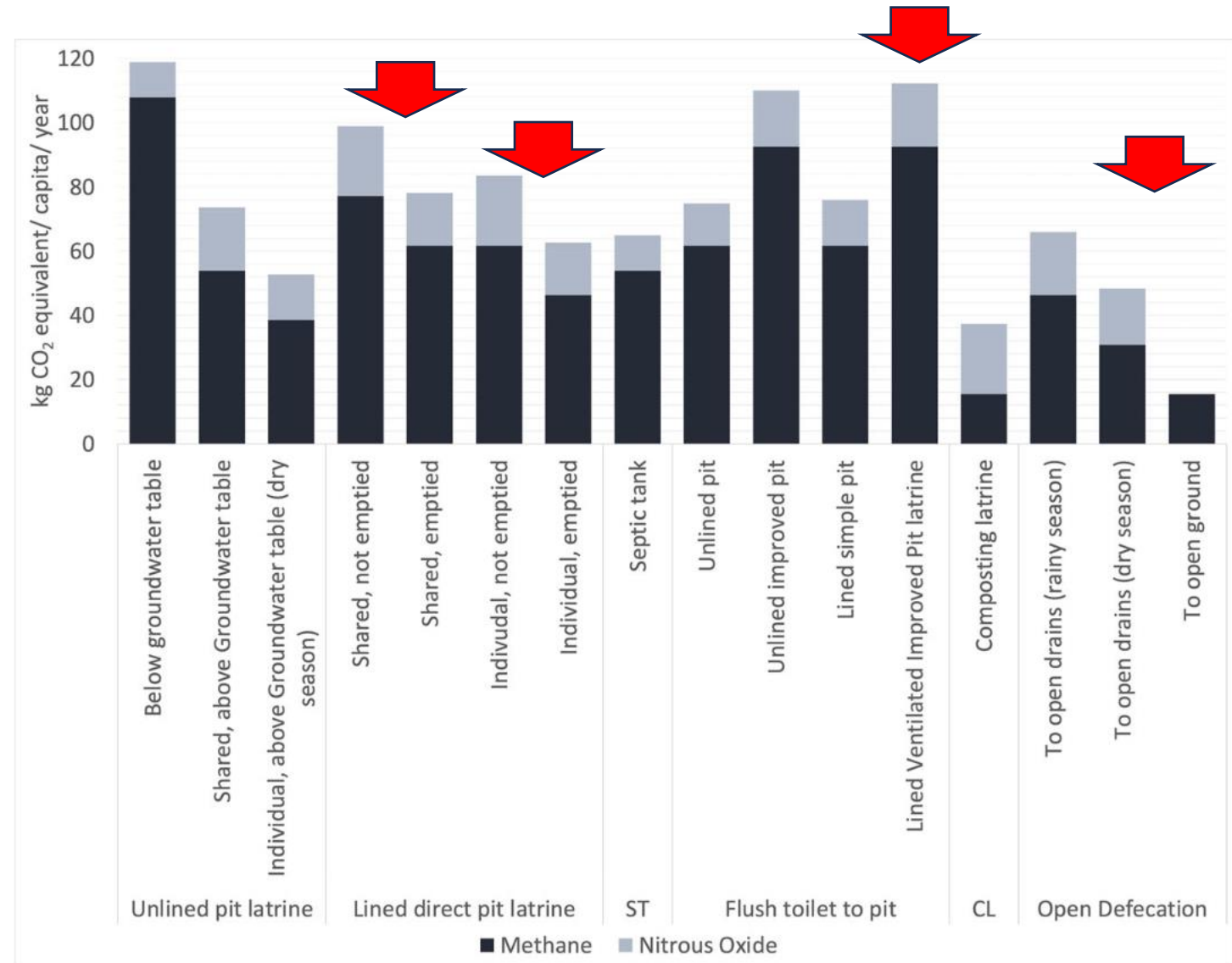
Significant challenges with measurement

Open defecation has among lowest emissions

Some safer options have the highest emissions (e.g., VIP)

Regular emptying reduces emissions

Comparing highest and lowest emission options, value could be about € 7 per person per year



Johnson et al, 2022

# Conclusions on Evidence for WASH Decisions

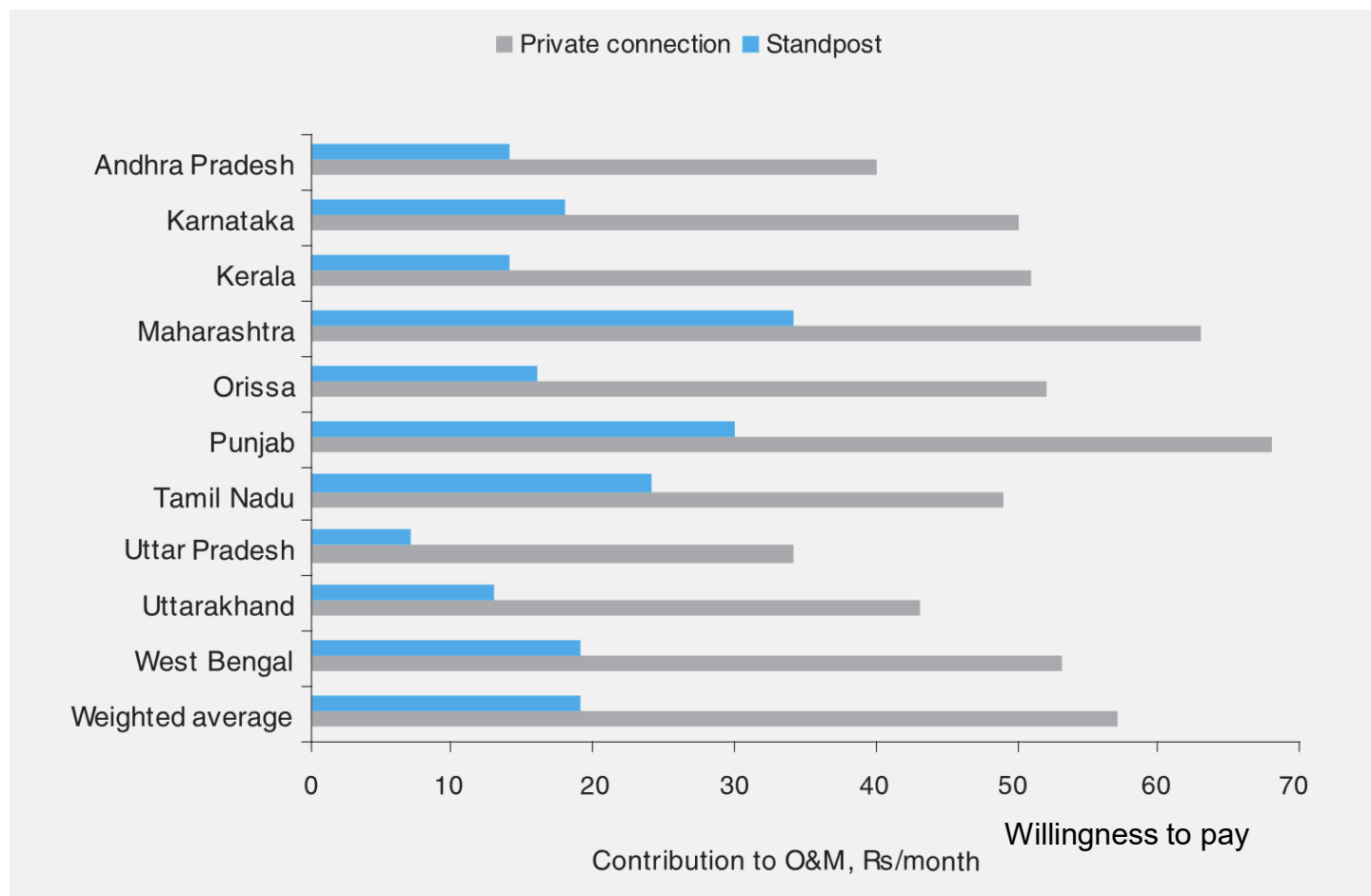
- Similarly to advocacy evidence, the availability of evidence for selecting options is not systematic or comprehensive, nor is it regularly updated
- Some rules of thumb exist (e.g., sewerage cost > FSM), but in most cases relative performance is contextual
- Sometimes greater value for money is found in investing in higher standards and longevity (e.g., story of CLTS and collapsing latrines)

# Part 3. Need for Economics to Inform Financing Mechanisms to Implement WASH

WASH has greater economic benefits than direct financial returns:- how to use evidence to design financing mechanisms and market incentives to boost investment in WASH?

# Willingness to Pay for Water Services

WTP is in line with economic theory: it elicits and aggregates personal values (maximizing household utility function) – and can inform price-setting



Misra, 2008

In India, WTP estimates indicated the amount households are willing to pay is – on average – sufficient to cover the O&M cost of improved water services and is within affordability threshold

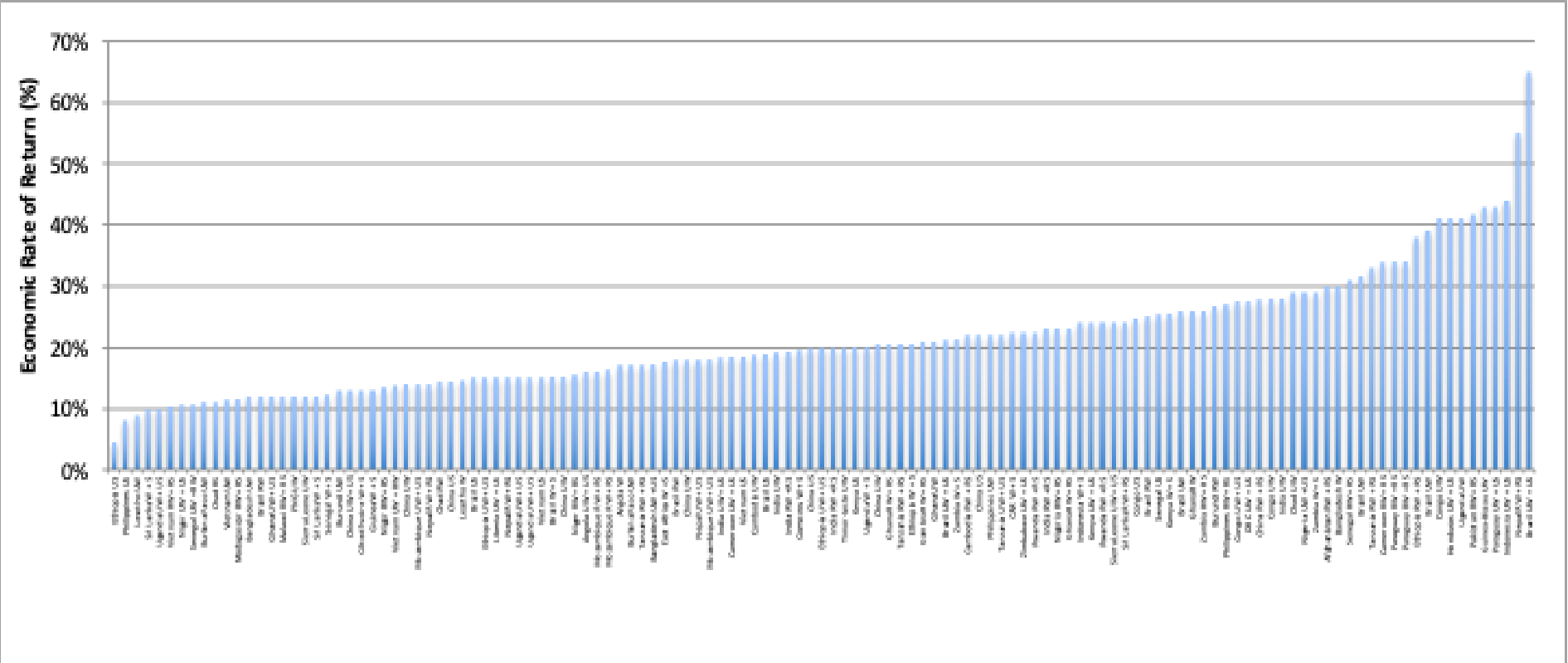
WTP is 3 times greater for a household water connection than a community source

Significant variation between States, largely influenced by average income



# The Use of Economic Rates of Return to Justify Largescale Projects

Development Banks such as World Bank, ADB and AfDB are required to calculate ERR for every project, while some have a minimum threshold (e.g., ADB with 9%).



Almost all projects reviewed have ERR >10%

Average ERR is 20%

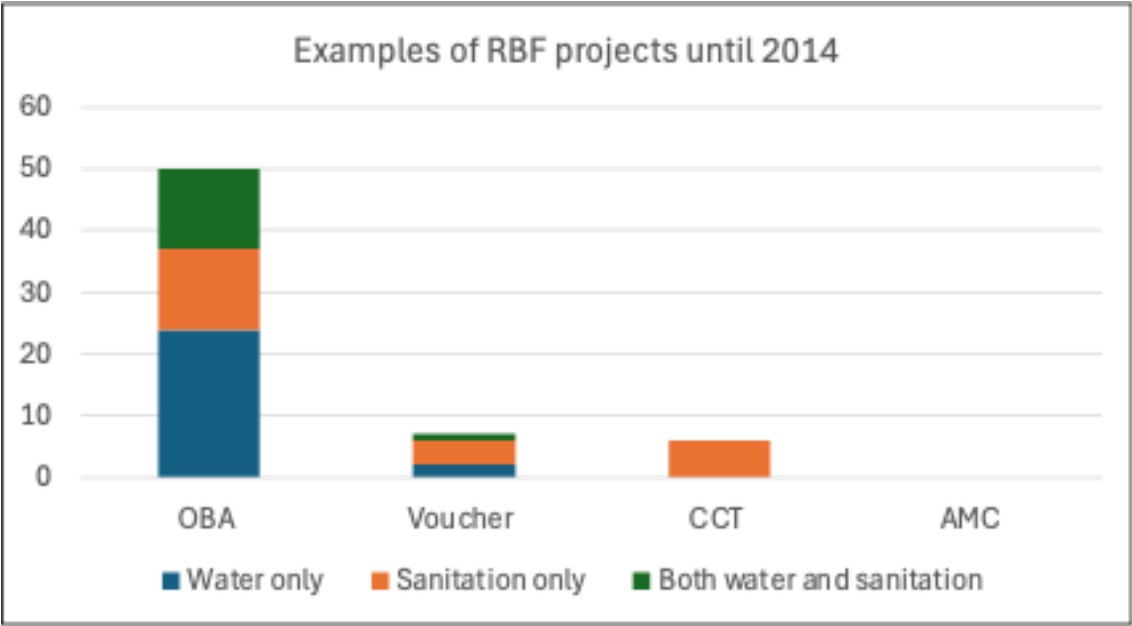
However, given the discretion in methodologies used, quality control is challenging

Sanitation and Water for All, 2012

# Results-Based Financing Helps ‘Guarantee’ Results for Funders while Incentivizing Innovation

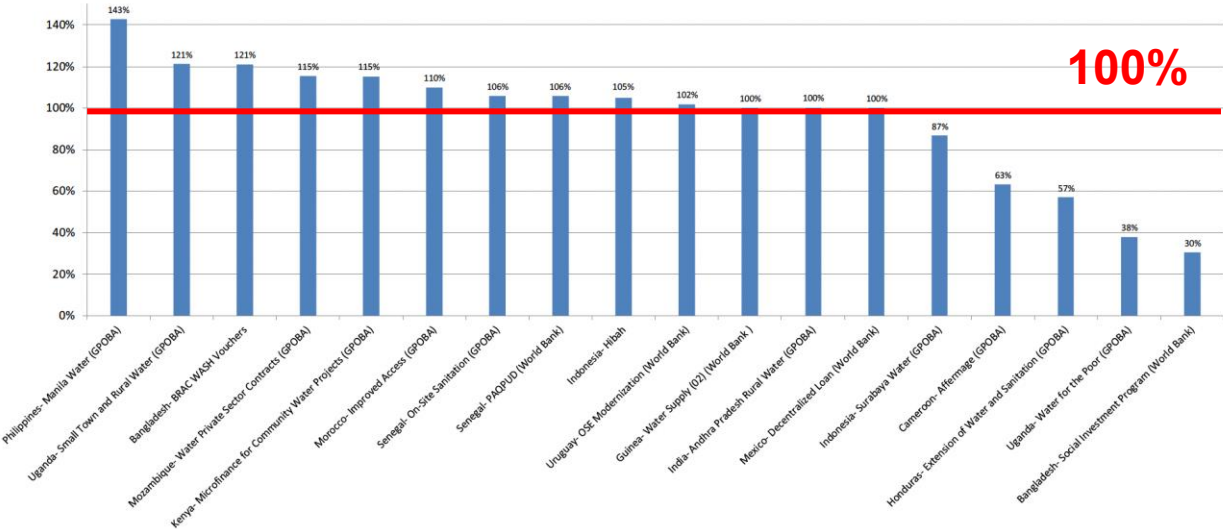
Socio-economic benefits are the basis of RBF. Development Banks and some bilateral funders, in particular, have adopted RBF mechanisms.

63 projects reviewed indicate Output-Based Aid dominates (payment to contractor), with Conditional Cash Transfers only in sanitation



Bill & Melinda Gates Foundation, 2015

RBF projects have performed well with respect to meeting the project targets, with more projects adjusting targets upwards



# The Importance of Unleashing Household Financing

Most benefits of WASH accrue to households / communities

While poor households face extreme cash constraints, they are often willing to take an affordable loan to finance water and sanitation improvements

Many development organisations now support micro-credit schemes. These have proven to be vital, given most countries do not subsidise household sanitation infrastructure

Water.Org's WaterCredit Initiative has been one of the front runners, bringing down the cost of credit to vulnerable and unserved households

- 19.5 million loans
- US\$7.7 billion disbursed in loans
- Average loan size of US\$403
- 98% of loans through WaterCredit are paid back
- 89% of borrowers are women

<https://water.org/solutions/watercredit/>

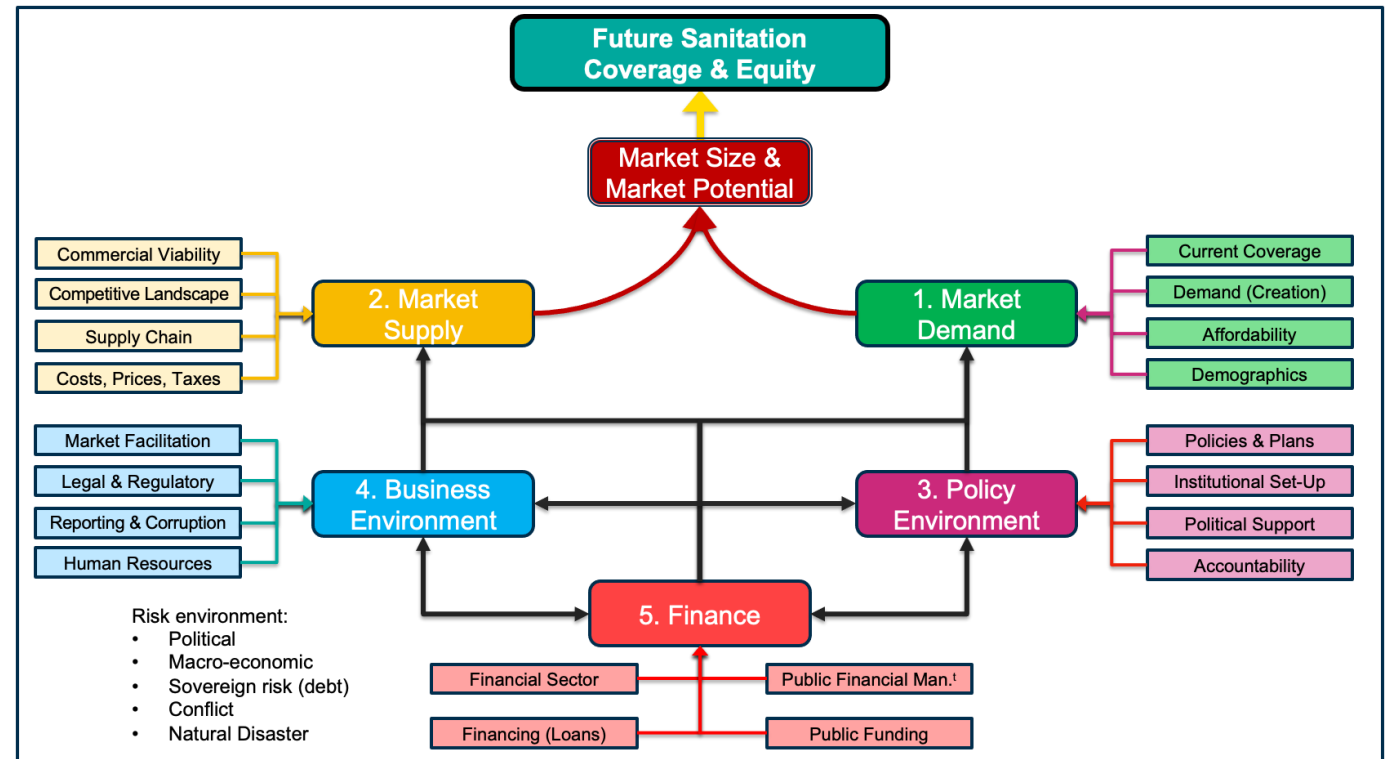
# Attracting Public & Private Investment Through Systems Strengthening & Sector Efficiency

Many organisations have invested in tools to understand the WASH enabling environment, conduct systems analysis, and assess market size, opportunities and constraints

In fact, 39 frameworks have been identified and reviewed

Their purpose is to recommend key actions to strengthen the EE

To better balance policy and market factors, the Sanitation & Hygiene Fund has developed the Sanitation Economy Maturity Assessment Framework (SANEMAT)



Sanitation & Hygiene Fund, 2026

# Conclusions on Evidence for WASH Financing

- Solid evidence supports some commonly used financing mechanisms
- Little evidence supports some mechanisms given they have rarely been applied, despite good arguments for them (e.g., social impact bond, advance market commitment)
- Evidence on the enabling environment needs to be consolidated within fewer frameworks, which are regularly and efficiently applied

# Closing Thoughts

- Economic analysis still relies on a lot of assumptions and extrapolation between settings, which may reduce its credibility for some decision makers
- However, methodologies can be improved, tested and explained
- Regular updating is possible if collaboration between some international organisations were achieved
- Some thought is needed on how to analyse micro-economic with macro-economic interventions simultaneously

# References

- Bill & Melinda Gates Foundation. Review of Results-Based Financing Schemes in WASH. Report by Castalia. January 2015.
- Hutton G, Coates S. Review of frameworks for assessing the strength of the sanitation economy and investment readiness. *Int. J. Environ. Res. Public Health* 2025; 22(12): 1868.
- Hutton G, Chase C. The knowledge base for achieving the sustainable development goal targets on water supply, sanitation and hygiene. *Int J Environ Res Public Health* 2016; 13(6).
- Hutton G, Chase C, et al. Financial and economic costs of healthcare associated infections in Africa. *Journal of Hospital Infections* 2024; 150:1-8.
- Johnson J, Zakaria F, Nkurunziza AG, et al. Whole-system analysis reveals high greenhouse-gas emissions from citywide sanitation in Kampala, Uganda. *Commun Earth Environ* 2022; 3: 80.
- Lomborg, B. The Nobel Laureates Guide to the Smartest Targets for the World 2016-2030. Copenhagen Consensus Center. 2015.
- Lomborg, B. Prioritizing Development. Chapter 23: Benefits and Costs of the Water Sanitation and Hygiene Targets for the Post-2015 Development Agenda by Hutton G. Cambridge University Press. 2018.
- Misra, S. Rural Water Supply in India: Willingness of Households to Pay for Improved Services and Affordability. June 2008. The World Bank.
- Sanitation & Hygiene Fund. Sanitation Economy and Menstrual Hygiene Marketplace Assessment in 5 Countries. UNOPS, Geneva, Switzerland. 2023.
- Sanitation and Water for All. Economic Impact of Water Supply and Sanitation: Global Overview. April 2012.
- Stenberg K, Watts R, et al. Cost-Effectiveness of Interventions to Improve Maternal, Newborn and Child Health Outcomes: A WHO-CHOICE Analysis for Eastern Sub-Saharan Africa and South-East Asia. *Int J Health Policy Manag.* 2021;10(11): 706-723.
- Toilet Board Coalition. Sanitation Economy Markets. 2017-2020. India, Kenya & Nigeria Case Studies.
- Tran D, Borisova T, Beggs K. The Cost of Alternative Water Supply and Efficiency Options under Uncertainty: An Application of Modern Portfolio Theory and Chebyshev's Inequality. *Earth* 2023; 4: 40-65.
- UNICEF. Financial and economic impacts of the Swachh Bharat Mission (Clean India Mission). UNICEF and Ministry of Drinking Water and Sanitation, India. 2018.
- UN-Water Global Analysis and Assessment of Sanitation and Drinking-Water (GLAAS). State of systems for drinking-water, sanitation and hygiene: global update 2025. Jan. 2026.
- Viet Anh N, Hutton G, Thuy Lan H, et al. *Economic assessment of sanitation interventions in Vietnam*. World Bank, Water and Sanitation Program. May 2012.
- WaterAid. Blueprint for a healthy economy: investing in water, sanitation, and hygiene in Africa. January 2026.
- World Bank. Economic assessment of sanitation interventions in Vietnam. World Bank, Water and Sanitation Program. 2012.
- World Bank. Economic Impacts of Inadequate Sanitation in India. World Bank, Water & Sanitation Program. 2011.
- World Health Organization. Global costs and benefits of drinking-water supply and sanitation interventions to reach the MDG target and universal coverage. Geneva: WHO. 2012.

