



Economic Benefits of Market Based Sanitation

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Existing Methods for Cost-Benefit Analysis

Value of benefits:

- Direct economic benefits of avoiding diarrhoeal disease (e.g. **healthcare costs**)
- Indirect economic benefits related to health improvement (e.g. **productivity**)
- Time savings (e.g. time traveling to or waiting for water or the toilet).



Existing Methods for Cost-Benefit Analysis

Economic loss of poor sanitation and hygiene
(Total: 448 million US\$)

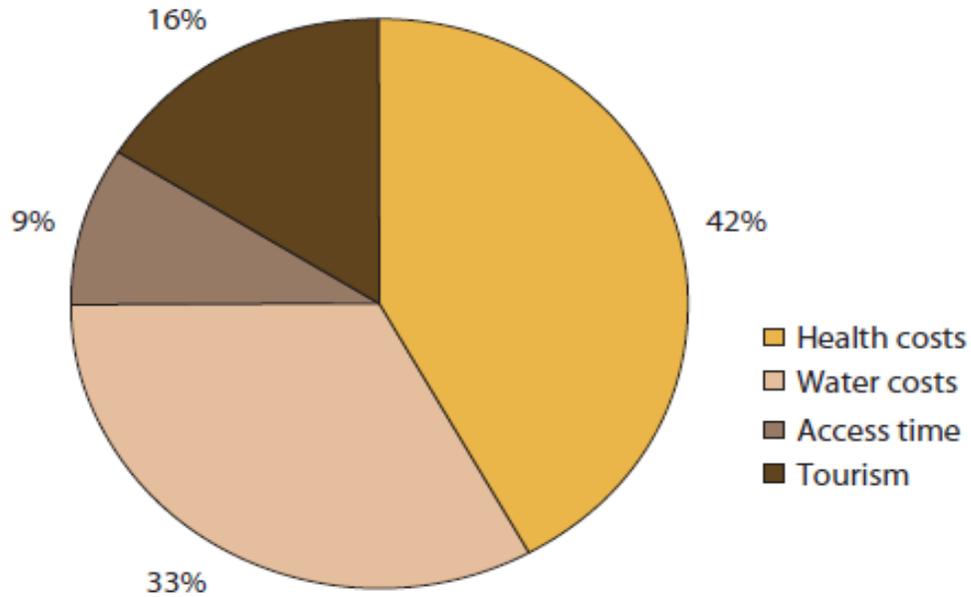
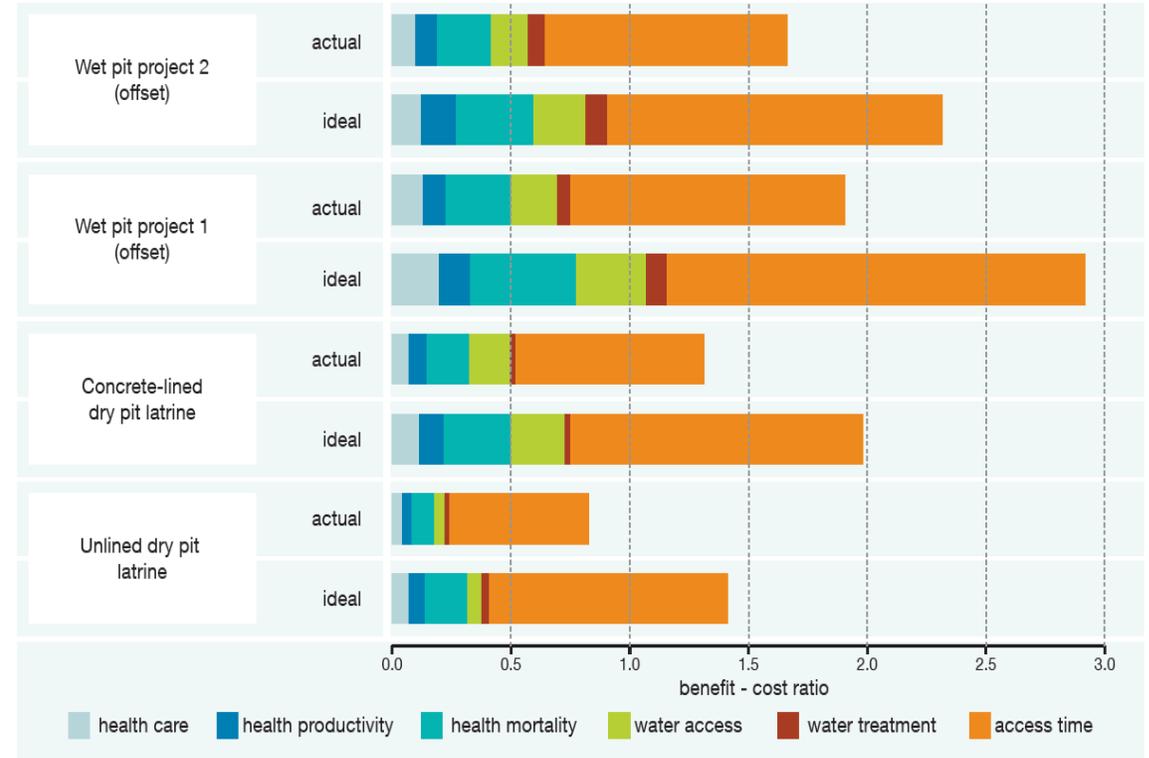


Table 1. From: Hutton.G. (Mar 2012) Economic Assessment of Sanitation Interventions in Cambodia, WSP Technical Paper.

FIGURE A: ACTUAL VERSUS IDEAL BENEFIT-COST RATIOS OF SANITATION OPTIONS IN RURAL AREAS, COMPARED TO "NO TOILET"



Emergence of Market Based Sanitation



Opportunity to better understand the market activity needed to deliver products and services.



Market based sanitation (MBS): “The development of a sanitation market in which the user makes a full or partial monetary contribution ... toward the purchase, construction, upgrade, and/or maintenance of a toilet from the private sector.”

Scaling Market Based Sanitation, FSG/USAID, June 2018.

Upstream Effects



Downstream Benefits

Estimating both



A novel model to capture the **downstream economic benefits** to households that purchase products and services as well as the **upstream economic benefits** to the market actors that produce them

Conceptual framework

The model defines a *market of interest* (MOI) and compares the costs and benefits between a 'program scenario' and a theoretical scenario in which the program does not exist (DNE scenario).

The MOI is defined by three dimensions:

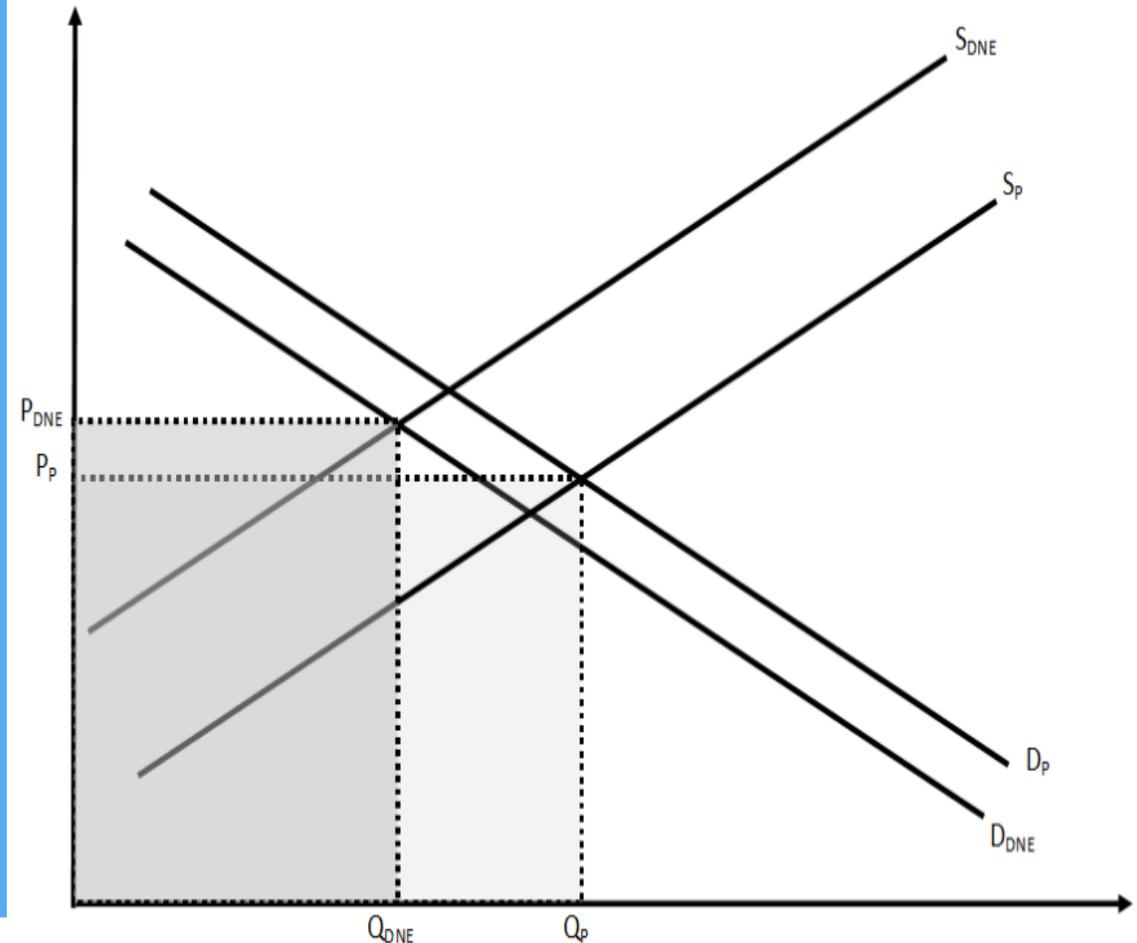
- The product/service
- Target market
- Time period



Assumed Program Activities

1. **Demand fulfillment:** support market actors to provide better products or services at a lower price (e.g. product design support, professional skills training, etc.)

2. **Demand generation/activation:** activities to increase consumers' perceived value of product or service, (marketing campaigns, use of sales agents)



Key terms

Total market value (TMV) is the product of the quantity of latrines sold and their market price (including retail mark-up, sales commission, shipping, installation).

Total sanitation benefit (TSB) is the total downstream benefit to households.

TMV is equal to the total cost to the economy to produce latrines, while the TSB is the total benefit generated by latrines.



Limitations, Assumptions

Not a **whole-economy** model

TMV is not economic impact, it is spending that is endogenous to the economy, which could be substituted; it represents reallocation of resources.

Assumes that households in both **Program Scenario** and **DNE Scenario** do not spend their income on other items that improve their productive capacity.

Assumes that latrine producers and their employees live in same areas as customers and spend on the same **bundle of goods**.



Application in Practice



WaterSHED's *Hands-Off* program (2011-2017)

Hands-Off Program (2011-2017)

The program aimed to **build the local market** in rural areas for high-quality toilets by:

1. Supporting small businesses to produce low cost, improved latrines
2. Increasing demand for toilets through innovating commercial marketing
3. Engaging local government, MFIs, and other actors to facilitating ongoing marketing development and growth



Calculations - DNE

DNE Scenario: Total Latrine Sales

Households in market of interest (as of 2017)	1,145,149
Background sanitation rate over (6-year period of program implementation)	9.46%
Number of households with new latrines	108,331
Replacement Latrines Multiplier	1.11
Total Latrines Sold	120,248

DNE Scenario: Total Market Value

Total Latrines sold	120,248
Market price per unit	\$609.53
Business profits per unit	\$69.02
Wages per unit	\$107.95
Total Market Value	\$73,294,865
Total business profits	\$8,299,248
Total wages	\$12,980,876

Calculations - DNE

DNE Scenario: Sanitation Benefit

Average HH size	4.6
Inflation in Cambodia (2005-2014)	71.3%
Annual Sanitation Benefit(per latrine)	\$71.41
Latrine Lifespan	25
Future Sanitation Benefit (per latrine)	\$1,785.30
Present Value Sanitation Benefit (per latrine)	\$1,008.39

Latrines sold	120,248
Present Value Sanitation Benefit (per latrine)	\$1,008.39
Total Sanitation Benefit	\$121,256,399

Total Sanitation Benefit / Total Market Value = market efficiency ratio
 \$121.3 million / \$73.3 million = 1.65

Calculations - Program

Program Scenario: Total Latrine Sales

HH in Market of Interest(2017)	1,145,149
Annual increase in number of HH with a latrine	3.9%
Program Timeframe (years)	7
Increase in households with a latrine	312,626
SP sales to NGOs	16,876
NGO subsidized or free latrines	73,937
Remaining increase households with latrine	221,812
Replacement Latrines Multiplier	1.11
Total latrine sales to consumers	246,212
SP sales to consumers	147,393
Non-SP sales	98,819

Program Scenario: Total Market Value

SPs	Latrines Sold to Consumers	147,393
	Market Price (per unit)	\$289.52
	Market Value	\$42,672,661
Non SPs	Latrines Sold	98,819
	Market Price (per unit)	\$398.87
	Market Value	\$39,416,231
TOTAL MARKET VALUE		\$82,088,892

Calculations - Program

Program Scenario: Sanitation Benefit

Latrines sold to rural consumers (SPs + Non-SPs)	246,212
Annual sanitation benefit (per Latrine) (USD)	\$1,008.39
Total Sanitation Benefit	\$248,277,334

Total Sanitation Benefit / Total Market Value = market efficiency ratio
\$248.3 million / \$82.1 million = 3.02

Results



In the program scenario:

- latrine sales more than doubled in underserved, rural areas
- costs to consumers were 53% lower
- TMV increased by \$8.6 million
- there was an additional \$1.9 million in profits to latrine producers and \$2.9 million in wages to the labor they hire
- TSB increased by \$127 million

Results (cont)



DNE scenario: every dollar invested contributes **\$1.65** to the economy due to improved health outcomes and time savings

Program scenario: every dollar invested contributes **\$3.03** to the economy

DNE scenario: **\$48 million** value added to the Cambodian economy over 7 years

Program scenario: **\$166.4 million** over the same period.

Discussion



By comparing these two scenarios the model elucidates how the program has transformed the MOI and how this impacts the wider economy.

Discussion

The Asian Development Bank Tonle Sap Rural Water Supply and Sanitation Sector Project (TSRWSSSP)

- Program expenditure: \$4.68 million
- 45,056 latrines installed over 4.5 years
- Cost \$103.87 per latrine



WaterSHED's *Hands-Off* program

- Program expenditure was \$2.65 million
- 246,212 latrines installed over 7 years
- Cost \$10.77 per latrine

Discussion

	TSRWSSSP	Hands-Off Program		
		SPs	Non-SPs	Program Total
Program Expenditure	\$4,680,000			\$2,652,066
Timeframe and Duration	4 yr 6 months			7 yr
Installed Household Latrines	45,056	147,393	98,819	246,212
Program cost per latrine	\$103.87			\$10.77
Cost savings to consumers	\$4,680,000			\$68,229,626
Total Sanitation Benefit	\$45,434,022	\$148,629,635	\$99,647,699	\$248,277,334
Economic Impact	\$47,774,022	\$105,956,973	\$60,475,815	\$166,432,788
Economic Impact/ Program Expenditure	10.2			62.8





Thank You

