WHY, WHAT and HOW

Impact Evaluations in WASH

East Asia Regional Impact Evaluation Workshop
Seoul, South Korea

(some material based on The Dirty Business of Open Defecation: Lessons from a Sanitation Intervention, by Shah, M. 2012)

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Economist Water and Sanitation Program
World Bank
Outline

WHY?
1. Context and need for Impact Evaluation
2. Knowledge Gaps

WHAT?
1. Tackling the problem
2. Issues addressed in implementation

HOW?
1. IE Design and Implementation
2. IE Results and By-products
Results from 2 WASH IE studies in Indonesia (East Java)
Context of Sanitation issues in Indonesia

Open defecation → Supply and demand-driven actions for behavior change

Health issues → Diarrhea, Parasites, Anemia, Height and weight, Cognitive development

- Around 18.6 million people in Indonesia lacked access to proper sanitation last year
- Indonesia “not on track” for sanitation MDG
Sanitation is essential for increasing overall quality of life and reducing extreme poverty.
Knowledge Gaps

• The water and sanitation program has a “MENU” of options for Technical Assistance to different countries

• Need to explore which aspects of sanitation campaign models can increase take-up in sanitation use and “adoption”, and certain key development indicators of children

• Test a larger scale program with evidence: East Java
Knowledge Gaps

• Conducting Formative Research as a Foundation for an Evidence-Based Intervention

• Projects design based on evidence from prior and newly commissioned programs

• Better understand the target population and to identify what factors influence the desired behaviors
Program basic description

Community-Led Total Sanitation (CLTS), behavior change communications, and social marketing of sanitation to generate sanitation demand and strengthen the supply of sanitation products and services at scale, leading to improved health for people in rural areas.
Tackling the problem

*Research Questions:*

What is the overall Impact of TSSM on
a) Sanitation improvement and take-up rates
b) Open defecation
c) Health indicators
### Issues addressed during IE implementation

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<tbody>
<tr>
<td>Participation Agreement from Phase 2 Districts</td>
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<td>Baseline Data Analysis</td>
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<tr>
<td>District Propose Communities</td>
<td>Baseline Survey</td>
<td></td>
<td>Sanitation Triggering Activities</td>
<td>Endline Survey</td>
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<td>Random Selection and Assignment</td>
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<td>Monitoring Survey</td>
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- Complexity in stakeholders and institutions involved in TSSM:
- Green-colored cells was actually the most difficult process because of communities, districts and participatory agreements need to be in place
### Total Sanitation and Sanitation Marketing Campaigns

<table>
<thead>
<tr>
<th>TSSM Project Intervention in East Java Province</th>
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<tbody>
<tr>
<td>Commencement of TSSM project activities at community level</td>
<td>November 2007</td>
</tr>
<tr>
<td>Number of communities declared and verified open defecation free</td>
<td>715 (as of May 2009)</td>
</tr>
<tr>
<td>Population gaining access to improved sanitation fully financed by households, between November 2007 and May 2009</td>
<td>325,627 persons</td>
</tr>
<tr>
<td>Percentage increase in local government funding for rural sanitation after TSSM intervention (in FY08 and 09 budgets, over 2007 baseline)</td>
<td>average 68%</td>
</tr>
<tr>
<td>Community investment in sanitation improvement leveraged per IDR 1 million (USD 100 in May 2009) of rural sanitation program expenditure</td>
<td>IDR 2-31 million, depending on district, between January 08 and April 09</td>
</tr>
<tr>
<td>Value of total TSSM technical assistance per East Java district including province level research, development and national level advocacy cost</td>
<td>USD 86,000 over 2007-10</td>
</tr>
<tr>
<td>Value of direct technical assistance to each district</td>
<td>USD 26,100 approx.</td>
</tr>
</tbody>
</table>
Perfect Experiment - Clones

Identify the target beneficiaries and clone them.
Keep in Mind...

**Before-After Comparison**

**Problem:** We don’t consider other things that may have happened over time.

**Compare enrolled with those not enrolled**

**Problem:** Selection Bias. We don’t know why they are not enrolled.

Both comparison groups may lead to biased estimates of the situation in the absence of the program (counterfactual) and the impact.
Randomization: Creating similar groups

With large sample, two groups have similar characteristics on average.
Program Operates at Community Level
IE Design and Implementation

Sampling

East Java: 29 districts total
10 districts in TSSM Phase 2

8 districts
participated in the IE study

160 communities
(‘dusun’ or hamlet)

2,087 households

Treatment
80 dusuns
1046 HHs

Control
80 dusuns
1041 HHs

Population

Sample

• Each district nominate at least 30 dusuns.
  • In each district, randomly select 20 dusuns from different villages.

• In each dusun, HH with children under five are surveyed

• The 20 dusuns in each district are randomly assigned
Collected Indicators

Community (160 dusuns):
- Water supply
- Sanitation facilities
- Sanitation behavior
- Existing programs

Household (2,087 hhs):
- Basic demography
- Welfare & labor market
- Water supply facilities
- Sanitation facilities
- Sanitation behavior

Children <5 (2,353 children):
- Anemia & anthropometry
- Diarrhea & ALRI
- Child development (ASQ)
- Feeding & behavior

Longitudinal (2,087 hhs):
- Child health measures
- T/C compliance measures

Endline (2,500 hhs):
- 2638 Children <5
- Fecal samples
- Everything else similar
IE Results

TSSM increased the number of households who built toilets

Treatment households were 28.9% more likely to build a toilet

% of households, without sanitation at BL, who built a toilet in the last 2 years

- **Control**: 12.8%
- **Treatment**: 16.5%

Although non-poor households built toilets at statistically significant higher rates, there was a positive (not statistically significant) effect also for non-poor households

- **Control**: 12.8%
- **Poorest 20% of households, by income**: 15.0%
- **Top 80% of households, by income**: 17.0% *Statistically Significant
Impact Evaluation of a Large-Scale Rural Sanitation Project in Indonesia

Lisa Cameron
Manisha Shah
Susan Olivia

The World Bank
Sustainable Development Network
Water and Sanitation Program
February 2013
• NO IMPACTS ON THE POOREST:

LARGE LIQUIDITY CONSTRAINTS

IMPROVE TARGETING TO THE POOR

SUPPLY MODEL FOR COST-SHARING OF SANITATION PRODUCTS
BUT WHAT ABOUT IMPACTS ON SPECIFIC SUB-GROUPS?

Main question:

Could the TSSM had effects on different ethnic groups?
• Ethnic groups have lower life standards
• They have a larger problem of sanitation take up and adoption
• Lower child health indicators
IE by-product

- Published in Waterlines Journal (2014)
- Used same dataset
- Identified indigenous or ethnic groups in dataset
- Re run models to obtain results in different groups
- Caution on External Validity (sample size of Ethnic groups may not be large enough)
Table 3 Summary results of TSSM on GEG

<table>
<thead>
<tr>
<th>Impact estimator¹</th>
<th>Standardized scores for child measurements and anthropometrics</th>
<th>Sanitation indicators</th>
<th>Child health indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Z-score height-for-age</td>
<td>Z-score weight-for-age</td>
<td>Z-score body mass index</td>
</tr>
<tr>
<td>Effect on female-headed household receiving treatment²</td>
<td>0.110</td>
<td>-0.051</td>
<td>0.119</td>
</tr>
<tr>
<td></td>
<td>(0.088)</td>
<td>(0.100)</td>
<td>(0.104)</td>
</tr>
<tr>
<td></td>
<td>1,800</td>
<td>1,802</td>
<td>1,785</td>
</tr>
<tr>
<td></td>
<td>0.087</td>
<td>0.140</td>
<td>0.166</td>
</tr>
<tr>
<td>Effect on household with ethnic composition receiving treatment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indonesia and other</td>
<td>-0.018</td>
<td>0.100</td>
<td>0.125</td>
</tr>
<tr>
<td></td>
<td>(0.128)</td>
<td>(0.293)</td>
<td>(0.199)</td>
</tr>
<tr>
<td></td>
<td>1,918</td>
<td>1,920</td>
<td>1,902</td>
</tr>
<tr>
<td></td>
<td>0.127</td>
<td>0.145</td>
<td>0.123</td>
</tr>
<tr>
<td>Javanese</td>
<td>-0.028</td>
<td>0.079</td>
<td>0.052</td>
</tr>
<tr>
<td></td>
<td>(0.090)</td>
<td>(0.132)</td>
<td>(0.128)</td>
</tr>
<tr>
<td></td>
<td>1,918</td>
<td>1,920</td>
<td>1,902</td>
</tr>
<tr>
<td></td>
<td>0.133</td>
<td>0.085</td>
<td>0.070</td>
</tr>
<tr>
<td>Madurese</td>
<td>0.164*</td>
<td>-0.001</td>
<td>0.072</td>
</tr>
<tr>
<td></td>
<td>(0.089)</td>
<td>(0.032)</td>
<td>(0.059)</td>
</tr>
<tr>
<td></td>
<td>2,001</td>
<td>2,002</td>
<td>1,981</td>
</tr>
<tr>
<td></td>
<td>0.159</td>
<td>0.145</td>
<td>0.311</td>
</tr>
</tbody>
</table>

1 Regressions followed same specification as reported by Cameron et al. (2013). Only impact estimators reported that interacted with the treatment variable with dummies for female headed households and with dummies defining ethnic composition in households.

2 Gender composition: As opposed to considering a female-headed household based on perception of survey respondent, the gender composition of the HH was defined if a) the household has more women than men (all members); and b) if the respondent for the child health modules is female.

3 From 72 hours to 7 days prevalence

4 Based on WHO official thresholds: Non-anaemic, Hb >= 110 g/l, Mild anaemia, Hb 100–109 g/l, Moderate anaemia, Hb 70–99 g/l, Severe anaemia, Hb < 70 g/l. Moderate and severe anaemia considered to take the value of 1 in the dichotomous variable and 0 otherwise.

5 As defined by the Joint Monitoring Programme (JMP)

Note: *** p<0.01, ** p<0.05, * p<0.1. All models run with village level cluster s.e. correction, and household controls and sanitation controls at baseline.

Source: author’s own estimations based on TSSM Indonesia Survey Data
IE BY PRODUCT RESULTS

• The Javanese ethnicity experienced no improvements in outcomes while the Madurese ethnic group showed significant improvements of one-sixth of one standard deviation (8.6 cm) of height-for-age in children (1.43 cm average)

• Also this same ethnic group showed a one-fifth of a standard deviation (3.7 cm) increase in head circumference (0.74 cm)

• Other ethnic groups showed a 20.6 per cent reduction in open defecation compared to non-exposed households
BY-PRODUCTS OF IMPACT EVALUATION: HELPED UNDERSTAND SCALABILITY AND CURRENT/FUTURE DATA NEEDS
TWO IMPACT EVALUATION HELPED TO...

• Address knowledge gaps in the WASH sector

• Redefine a policy dialogue with GoI with respect to sanitation and the active role that districts and communities play in implementation, and oversight

• Contribute to develop further knowledge on what works and what doesn’t

• Provide evidence to better target these programs to the poorest
Thank you!
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