The case for using Decision Support Tools (DST) for sanitation-related policymaking

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INTRODUCTION

- Limited evidence exists on the impact of sanitation-related policies, in part, because even when policies do exist on paper, they are rarely enforced or implemented in practice (e.g., Uganda's National Public Health legislation mandates that houses have a toilet; but local authorities rarely enforce the policy for reasons such as inadequate resources).
- Understanding the costs and benefits of a policy(ies) can better guide policymakers in their decision-making; for instance, it can help in selecting a policy from a range of options, and justifying the selection and cost of implementation.
- The USAID WASHPaLS project developed a quantitative decision-support tool (DST) that estimates the costs and benefits of a given policy to assist governments, donors, and implementers in decision-making.
- This presentation illustrates the methodology that policymakers and policy advocates can use to develop context-specific DSTs, makes a case for utilizing DST as an innovative approach to guide sanitation-related policymaking, and provides insights into related limitations and next steps.

METHODS

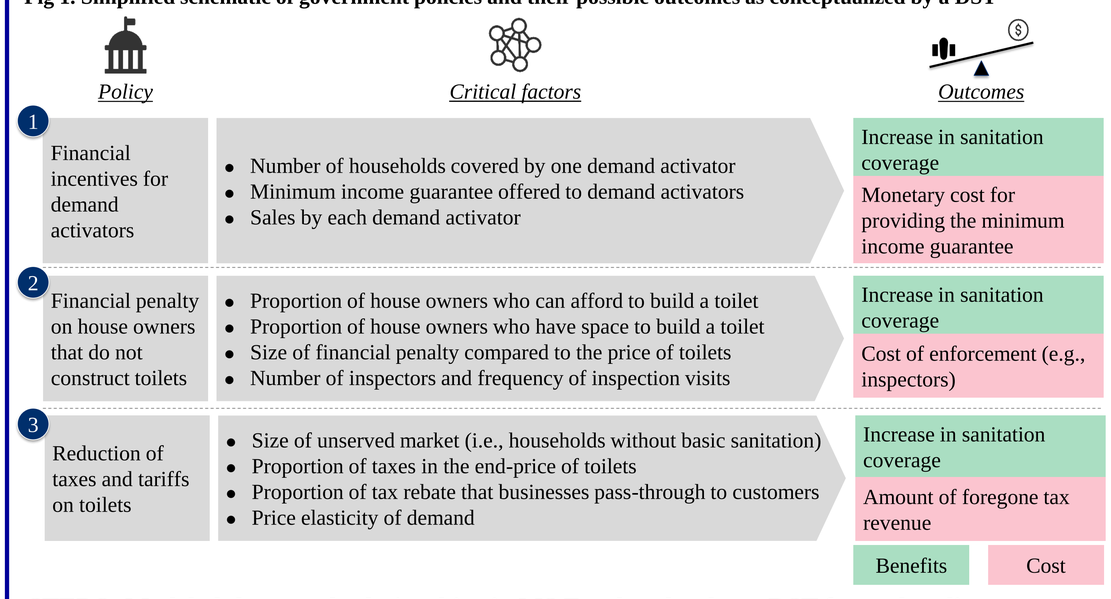
We developed Microsoft Excel-driven DSTs following the steps outlined below:

STEP 1: Identified three policies as examples to simulate their benefits (i.e., change in sanitation coverage), and implementation costs for government (*Figure 1*).

STEP 2: Developed causal logic between the three policies and their intended outcomes

- Consider, for example, a policy to exempt sanitation businesses from taxes with a goal to increase sanitation coverage (*P3 in Figure 1*). The following critical factors influence the policy's outcomes:
  - **Benefit:** Tax rebate offered to toilet businesses can significantly increase sanitation coverage if: 1) a large share of households is currently unserved due to high prices, 2) taxes are a significant constituent of the end-price of toilets, 3) businesses transmit some of their cost savings to consumers by lowering end-prices, and 4) demand for toilets by unserved households is highly responsive to a reduction in price (i.e., demand for toilets is highly price elastic).
  - **Cost:** The amount of government tax revenue foregone would be significant if: 1) a large share of unserved households purchase toilets due to the tax rebate, and 2) taxes are a significant constituent of the end-price of toilets.

Fig 1. Simplified schematic of government policies and their possible outcomes as conceptualized by a DST



STEP 3: Modeled the causal relationships in MS Excel to develop a DST for each policy

- Each excel model has three components:
  - **Inputs:** Data (e.g., demography, household sanitation coverage) and user-defined assumptions (e.g., level of tax rebate).
  - **Intermediate calculations:** Mathematical equations of the defined causal logic applied to the above inputs.
  - **Outputs:** Projected increase in sanitation coverage and cost to the government for implementing the policy.

STEP 4: Analyzed the results of the three policies

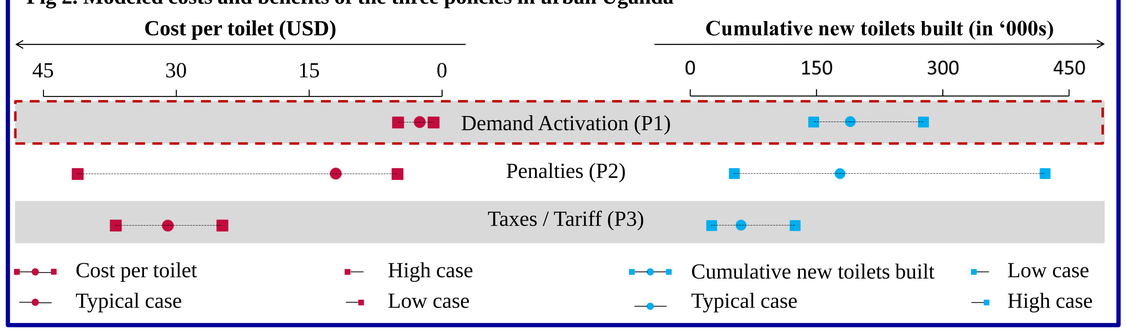
- We incorporated relevant, publically available data (e.g., Uganda National Population and Household Census[1], tax rates, market prices of toilets, personnel salaries) in the three tools to simulate outcomes.
- We compared the range of outcomes, conducted sensitivity analyses, and examined the cost of implementation.

RESULTS & DISCUSSION

I. Relative cost-benefit outcomes help to prioritize policy options

- DSTs help evaluate the potential range of outcomes of different policies and identify promising options. Such evaluations provide a cost-efficient alternative to piloting multiple policies, which require more time and resources.
- Using DSTs, we evaluated three policies for increasing sanitation coverage in urban Uganda, considering a range of values for the key assumptions (i.e., 'low case', 'high case', and the average or 'typical case'). Simulated results (*Figure 2*) suggest the following:
  - *Financial incentives for demand activators (P1)* is the most promising option, with less uncertainty in benefits and lowest costs per toilet.
  - *Financial penalty on house owners (P2)* exhibits good potential but has significantly greater risk due to the wide variance in potential impact and costs.
  - *Reduction of taxes and tariffs (P3)* is the least attractive option because the impact is significantly lower and costs are projected to be substantially higher than the two other policies.

Fig 2. Modeled costs and benefits of the three policies in urban Uganda

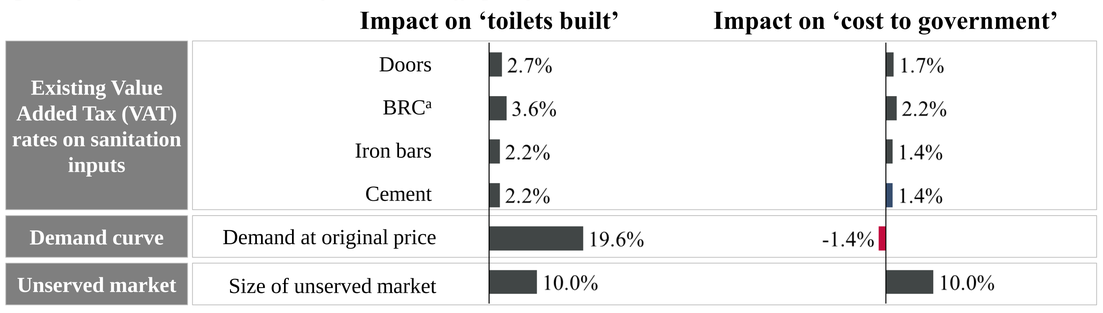


RESULTS & DISCUSSION (Cont'd)

II. Identification of critical factors influences decision-making

- DSTs help stakeholders identify and understand the critical factors or key drivers which have the greatest influence on policy outcomes, and thus increase their confidence in the results.
- The sensitivity analysis for the *reduction in taxes and tariffs* policy (P3) indicates that the price elasticity of demand and the size of the unserved market have a significantly higher impact on outcomes than factors which are within the control of policymakers, such as changes in the VAT rates (*Figure 3*). While policymakers may be unable to influence the critical factors in the short-term, they may seek more accurate data to increase their confidence in the simulated results prior to making a decision.

Fig 3. Key drivers of the *reduction of taxes and tariffs* policy



Note: The graph measures the percentage change in outcomes ('toilets built', and 'cost to government') for a 10% change in the corresponding inputs; a. BRC: Pre-fabricated steel reinforcement material

- Similarly, the key drivers underlying the *financial penalty on house owners* policy (P2) are the proportion of households that can afford toilets, and the proportion of households that can afford and have space to build a toilet; while the number of households covered by one demand activator, minimum income guarantee offered to demand activators, and sales by each demand activator are the most critical factors for the policy providing *financial incentives to demand activators* (P1).

III. Estimates of financial and human resources assist in planning policy implementation

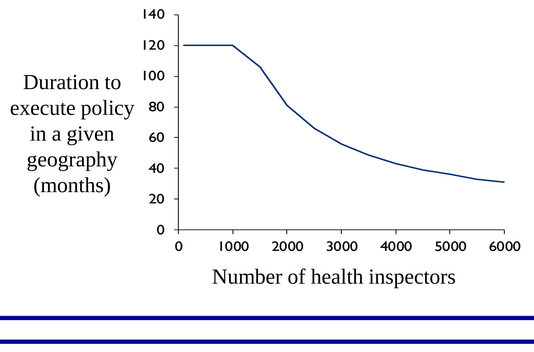
- DSTs can help stakeholders plan implementation by generating estimates of the financial and human resources required to implement a policy; estimates are particularly helpful for operational, advocacy, and budgetary purposes.
- Our examination of the 'minimum' investment required for the policies in urban Uganda (*Table 1*) suggest that policy P1 requires the least investment, followed by policy P2; policy P3 requires the highest total investment.
- The nature of the investment also varies—the cost of policy P2 is a budgetary outlay for the salaries of health inspectors less the revenue from penalties for non-compliance. By contrast, the cost of policy P3 is the fiscal revenue foregone (i.e., tax and tariffs that would have otherwise been collected).

Table 1: Investment required to implement the three policies in urban Uganda

Policy	Low case	Typical case	High case
Demand activation (P1)	USD 0.49 million	USD 0.43 million	USD 0.33 million
Penalties (P2)	USD 2.13 million	USD 2.13 million	USD 2.14 million
Taxes/ Tariffs (P3)	USD 3.25 million	USD 5.15 million	USD 8.49 million

- DSTs also provide estimates of the personnel and time required for executing a policy over a limited period of time, or in a given geography. For example, the *financial penalty on house owners* policy estimates the time required for implementing the policy (i.e., surveying, issuing notices, and processing penalties) in a given geography depending on the number of health inspectors available (*Figure 4*).

Fig 4. Estimated time required to execute the "penalty" policy as a function of the number of health inspectors



CONCLUSIONS

- The DST approach can assist policymakers interested in shaping sanitation markets in developing economies.
- WASHPaLS invites interested stakeholders to pilot the DST approach in their contexts and contribute evidence of the tools' efficacy and utility compared to alternative approaches. WASHPaLS' contribution to the sector will include:
  - open access to the DSTs, with accompanying user guides to support learning, application and adaptation;
  - dissemination of lessons learnt from application of the DST approach; and
  - provision of technical assistance to stakeholders interesting in applying the DST approach in their contexts.

References:

[1] Uganda Bureau of Statistics, 2016. The National Population and Housing Census 2014 – Main Report. Kampala, Uganda

[2] USAID, 2018. Scaling Market Based Sanitation: Desk review on Market-based rural sanitation development programs. Washington, D.C., USAID Water, Sanitation, and Hygiene Partnerships and Learning for Sustainability (WASHPaLS) Project

Acknowledgements

USAID WASHPaLS project: The Water, Sanitation, and Hygiene Partnerships and Learning for Sustainability (WASHPaLS) project is a five-year (2016–2021) Task Order working to improve water supply, sanitation and hygiene (WASH) programming by identifying, researching and sharing best practices for the delivery of WASH services and sustained behavior change. WASHPaLS is led by Tetra Tech in collaboration with several non-governmental organizations and small-business partners — Aquaya Institute, Family Health International (FHI 360), FSG, and Iris Group — that contribute expertise in state-of-the-art WASH programming and research.

One of the first tasks completed as part of the sanitation component of this project is a desk review of MBS approaches, using literature survey, key informant interviews, and in-depth systematic case study analysis of MBS projects.[2]