Cost-Benefit Analysis of Sanitation Marketing Interventions in the Western Pacific

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LIVE & LEARN INTERNATIONAL
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Background

• The Western Pacific Sanitation Marketing and Innovation Program (WPSMIP), funded by the DFAT and implemented by Live & Learn Environmental Education (LLEE) in partnership with International Women’s Development Agency (IWDA) and International Water Centre (IWC) is the Pacific’s first WASH project that has promoted enterprise-led sanitation improvements in peri-urban settlements.

• Fiji, Papua New Guinea (PNG), Vanuatu and Solomon Islands
Contribution to the Study

• The study undertaken in July 2017 contributes to the assessment of the project’s potential impact, focusing on the value for money it could potentially create during the implementation period as well as after completion.

• Post-completion Value for Money (VfM) analyses, such as those for projects funded by DFAT often use an analytical framework focusing on overarching principles including economy, efficiency, effectiveness and ethics.

• By investigating the WPSMIP’s value from a forward-looking cost-benefit perspective including forecasting of sustainability and social impact, it is neither an evaluation of the project, nor a predictor of success, but rather a document measuring potential long-term net benefits.
Sanitation in Informal Settlements

• Informal settlements comprise between 25-40% of households in the Fiji, PNG, Solomon Islands and Vanuatu and will grow to between 30-65% by 2023.

• Over 40% in the urban areas of PNG, 35% in Vanuatu, 19% in Solomon Islands, and 8% in Fiji use shared or private unimproved latrines and open defecation.

• These figures can be significantly reduced through interventions that focus on informal settlements.

Sanitation Marketing

• Globally, including in the Pacific, past grant based sanitation projects have not had much success particularly due to the lack of local ownership and non-completion due to insufficient funds.

• More market-led sanitation approaches are needed.

• Support for social enterprises has the potential to result in social benefits to communities while enterprises make modest or market rate profits, or at least break even.
Types of Analyses Undertaken

To ensure rigour in the study, three types of analyses were undertaken for the three best performing sanitation enterprises of the project:

- An *enterprise profitability analysis* based on standard and agreed cost models.

- A *community benefit/cost analysis* based on costs incurred by the community and benefits they accrue from such expenditure.

- A *project-based benefit/cost analysis* considering all relevant project costs and their corresponding benefits.
Enterprise Level Analysis

• From an enterprise perspective, the value for money calculation revolves specifically around profitability of the business (revenues vs. costs).

• The relevant costs were toilet construction materials, construction labour, marketing and management fees.

• The revenue stream mainly revolved around selling of cost-effective toilets.
Community Level Analysis

From a community perspective, the main social costs of poor sanitation, were as follows:

- Mortality: The economic cost from instances of premature death due to poor sanitation
- Productivity: The value of economic activity lost due to sanitation related sicknesses
- Healthcare: The cost of treating sanitation-related diseases including both public and private sector treatment
- Access: The value of time foregone due to people not having access to a toilet

There are other important benefits that are difficult to monetise - issues such as greater dignity and safety are often invaluable.

Project Level Analysis

• Combines enterprise and community costs and benefits

• Other project expenditure added as costs
Discounting and Discount Rates

• Discounting recognises the fact that stakeholders value future costs and benefits differently from the present.

• In terms of discounting rates used, the same discount rate was used for benefits and costs within each analysis.

• Discount rates were based on opportunity cost of capital (savings rate for community analysis and market interest rate for project analysis).

• Given that different stakeholders have different time preferences three different rates were used for each of the three country analyses.
Enterprise Level Calculations

The formula used for the net present value calculation of cash flow for the enterprise level calculations was as follows:

\[ NPV = \sum_{t=1}^{n} \frac{C_t}{(1 + r)^t} - C_0 \]

where:  
- \( C_0 \) = initial cost  
- \( C_t \) = net cash flow  
- \( t \) = year  
- \( n \) = final year  
- \( r \) = discount rate
Community and Project Level Calculations

The net present value (NPV) calculation formula used for the community and project level calculations was as follows:

\[ NPV = \sum_{t=0}^{n} \frac{B_t - C_t}{(1 + r)^t} \]

where:

- \( B \) = benefits
- \( C \) = costs
- \( t \) = year
- \( n \) = final year
- \( r \) = discount rate
# Findings

<table>
<thead>
<tr>
<th>NPV of 10-year enterprise cash flow</th>
<th>CBSM - Fiji</th>
<th>TSE – Vanuatu</th>
<th>Topwan – PNG</th>
</tr>
</thead>
<tbody>
<tr>
<td>-AUD1,969</td>
<td>AUD 17,703</td>
<td>-AUD15,745</td>
<td></td>
</tr>
<tr>
<td>NPV of 10-year community benefits</td>
<td>AUD 33,540,804</td>
<td>AUD 4,360,793</td>
<td>AUD 827,778</td>
</tr>
<tr>
<td>NPV of 10-year project benefits</td>
<td>AUD 23,205,311</td>
<td>AUD 1,862,811</td>
<td>AUD 1,713,957</td>
</tr>
</tbody>
</table>
Findings

• There are significant risks about the viability of the enterprises, and the project needs to focus on improving the profitability of the businesses.

• If the businesses do not become viable, toilets will not be provided and communities will not receive benefits.

• From an enterprise perspective, the analysis of the cash flow assuming that the seed capital is used up as a bulk expense suggests that costs will exceed benefits for the two enterprises in Fiji and PNG.

• For the enterprise in Vanuatu (TSE), total benefits exceed costs, and suggests that it is the most viable of the three at this current stage.

• The results also highlight that all businesses must maintain a steady growth rate and ensure they receive payments for products sold, or risk becoming less profitable.
Findings

• From a community perspective, significantly large benefits will be derived by communities in all three countries with Fiji community likely to benefit the most.

• In Fiji and Vanuatu, the beneficiaries’ return on ‘investments’ on toilets will be worthwhile particularly due to increased access and health.

• In PNG, the greatest benefits would be derived from those related to reduced mortality and better health.

• From a project perspective, all three countries are value for money, with the Fiji project being significantly more value for money than those of Vanuatu or PNG.
THANK YOU.

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