# Understanding the life cycle cost of climate-resilient sanitation:

# Lessons from studies in Laos, Solomon Islands, and Bangladesh

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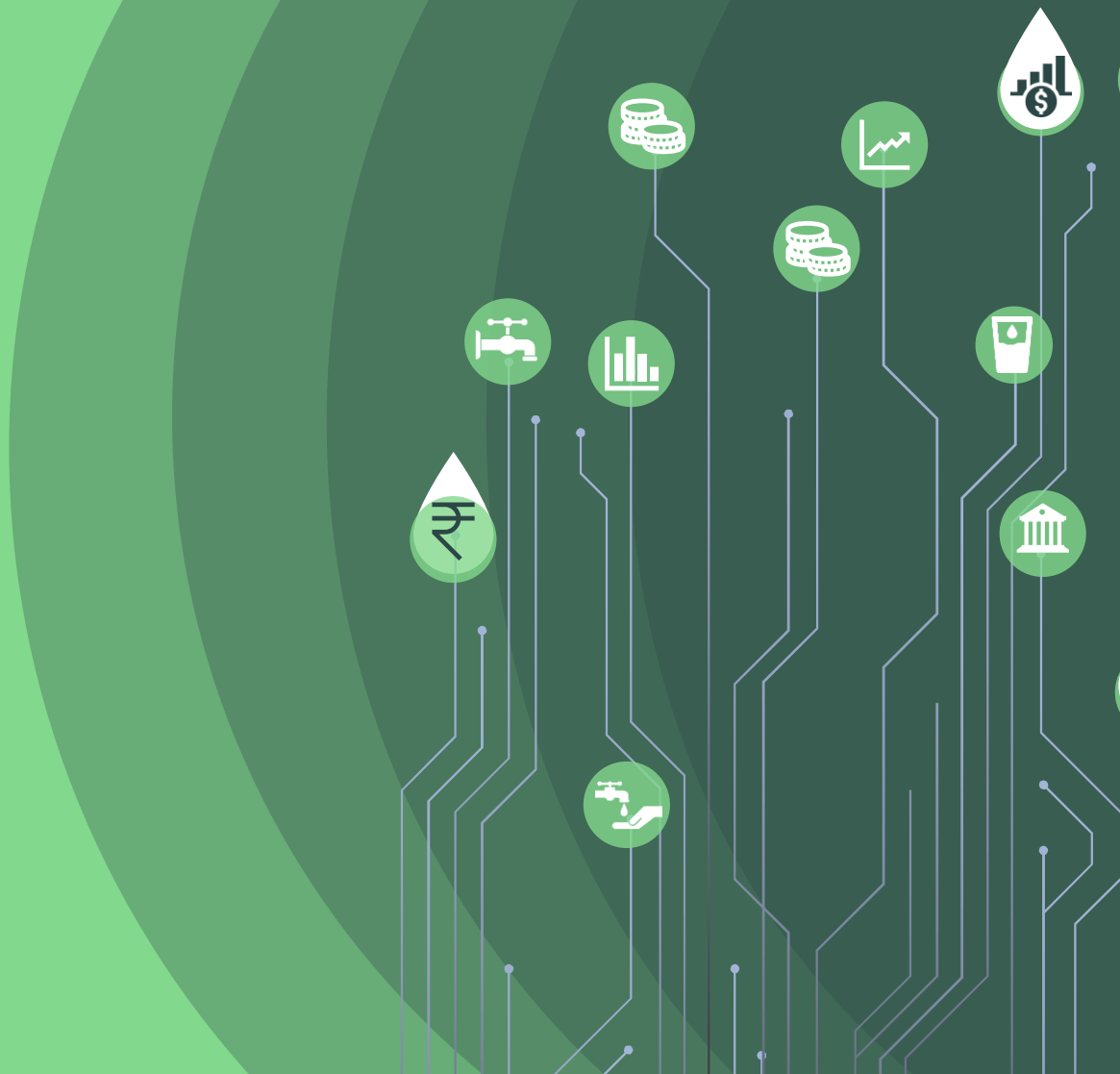


# Agenda

01 Introduction

02 Analytical framework and study sites

03 Key findings

04 Policy implications

# 01

# Introduction

# Justification

**Climate change is reshaping the operating context for sanitation systems.**

- Sanitation systems must now operate under increasing climate risks.
- Governments need better evidence on the **cost of resilient sanitation services**
- Climate-resilient sanitation requires **new approaches to system design and financing**

**Key challenge:**

- Limited understanding of the **lifecycle cost of climate resilient sanitation systems**

# Key messages

- **Integrating climate resilience into sanitation planning is needed** to strengthen sanitation systems and ensure they remain functional under changing climate conditions.

- **Climate-resilient sanitation systems are often more expensive than conventional systems, and households bear most of the costs;** therefore, innovative financing mechanisms are needed to ensure financing and affordability of climate-resilient sanitation services.

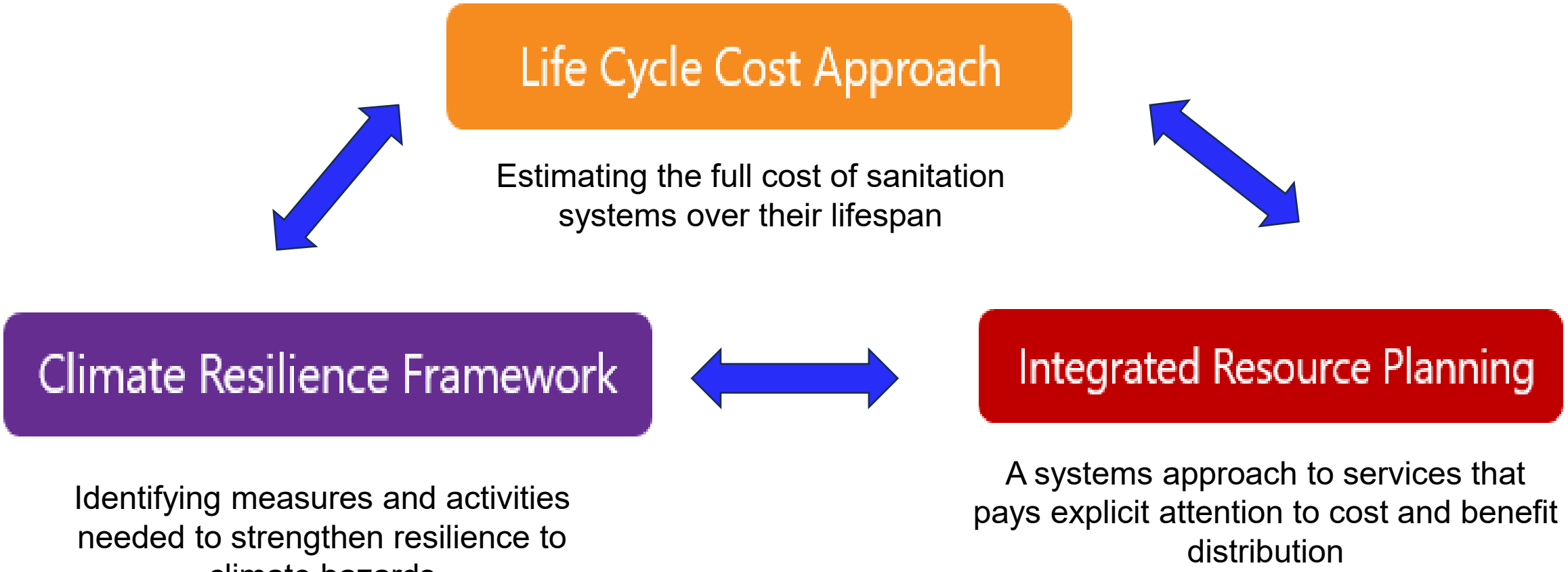
- **The cost of climate-resilient sanitation varies depending on design, climate hazards, and local context**, highlighting the need of innovative approaches to designing climate-resilient sanitation systems that keep costs manageable while ensuring resilience.

- **Expand the evidence base** through local costing studies to support better financial planning and access to climate finance (e.g., GCF).

# 02

# Analytical Framework

# Each study combines three approaches:



# Three case studies were conducted:

## Rural areas


**Laos – Champhone District (Rural).** Costing safely managed sanitation and climate-resilient rural systems.


**Solomon Islands – Malaita, Central, Western Provinces (Rural).** Costing basic sanitation and climate-resilient in rural communities.

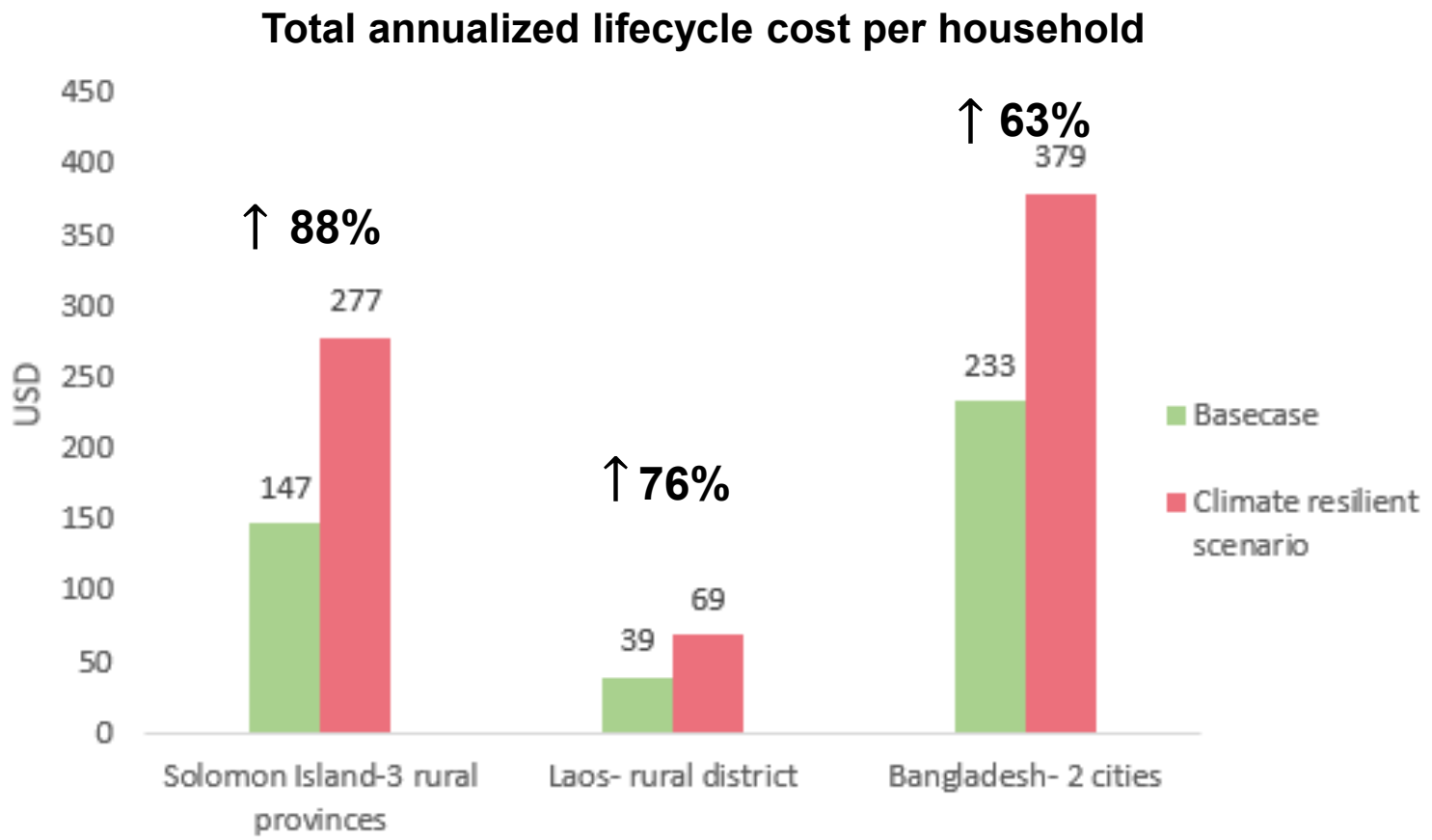
## Urban areas


**Bangladesh – Khulna and Bagerhat Cities (Urban)** Costing safely managed sanitation and climate-resilient urban systems.

# 03

# Key findings

# **F1:** Climate-resilient sanitation systems have a higher annualized cost per household than conventional sanitation systems.




This reflects **additional investments** in infrastructure design, operational practices, trainings and institutional capacity

# **F2:** The variability of climate-resilient costs depends heavily on sanitation system design and climate hazard

| Stage | CR design for Champhone, Laos |
|---|---|
| 1. Interface | The house structure is made of wood, the **wall made of concrete block,** and roof are made of zinc.<br>Cover plate (slab, squat pan, pipe for ventilation) and **a platform to raise it above the ground**. |
| 2. Containment | Back up public toilets (emergency)<br>**Raised septic tanks-** (leach fields) |
| 3. Emptying & Transfer | Regular inspections, repairs septic tanks<br>Increment of **frequency of emptying**, operators training |
| 4. Treatment – FSTP | Flood barriers to protect FSTP, sealing system to avoid heavy rain, operators training |

Upgraded infrastructure for flooding

Alternative options in case of emergency situations

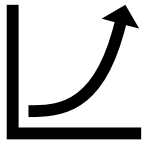
Emphasis on operational & maintenance

Emphasis on users and operators awareness and preparedness

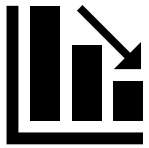
In the case of Laos, flood resilience required: (i) **Elevated or flood-resistant infrastructure**,(ii) **Improved sludge management practices** (iii)**Training for operators and users**, (iv) others

# **F3:** Local conditions significantly affect rural sanitation costs in both directions

**Example from Solomon Islands:**



- Communities located far from the capital face **higher transport costs for materials and technical services**.

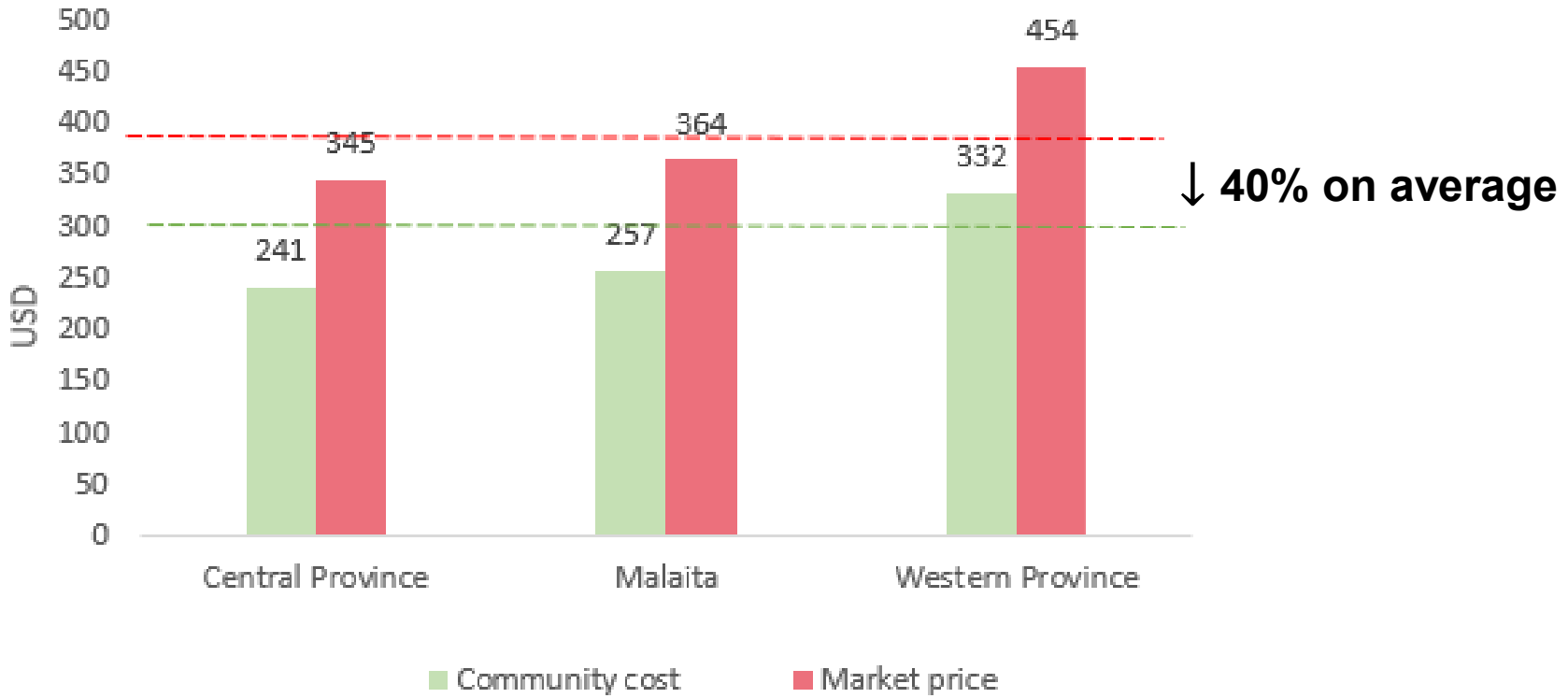


- Local natural resources availability and community labour contributions can **reduce overall costs in some locations**.

- Assumptions in model such as **discount rate, lifespan**, etc can also influence the increase/decrease of the total cost.

# **F3:** Local natural resources availability can reduce overall costs in some locations.

**Example from Solomon Islands:**

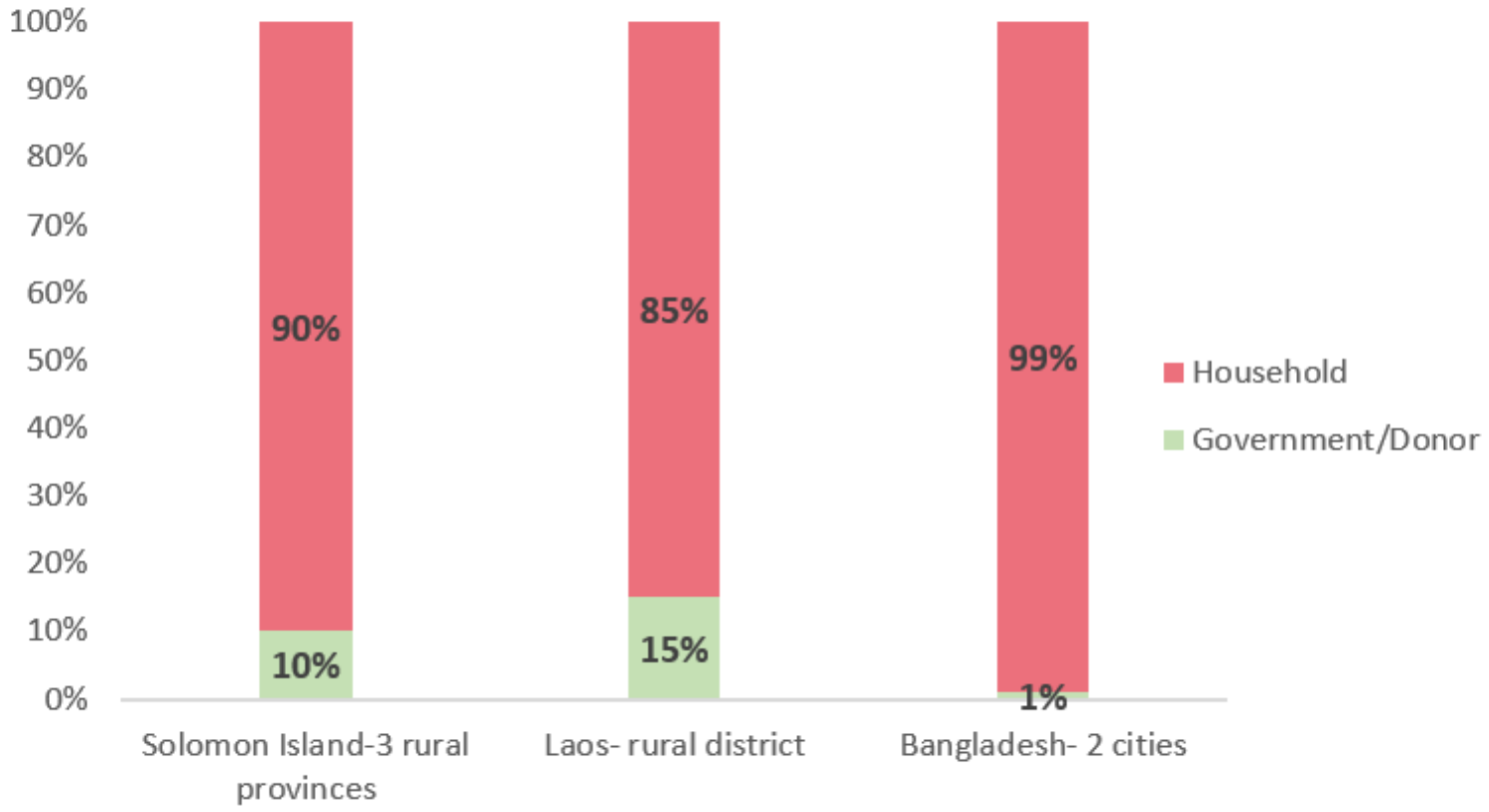



**↓ 40% on average**

- Local natural resources availability and community labour contributions can **reduce overall costs in 40% on average**.

# **F4:** Households bear a large share of the total costs

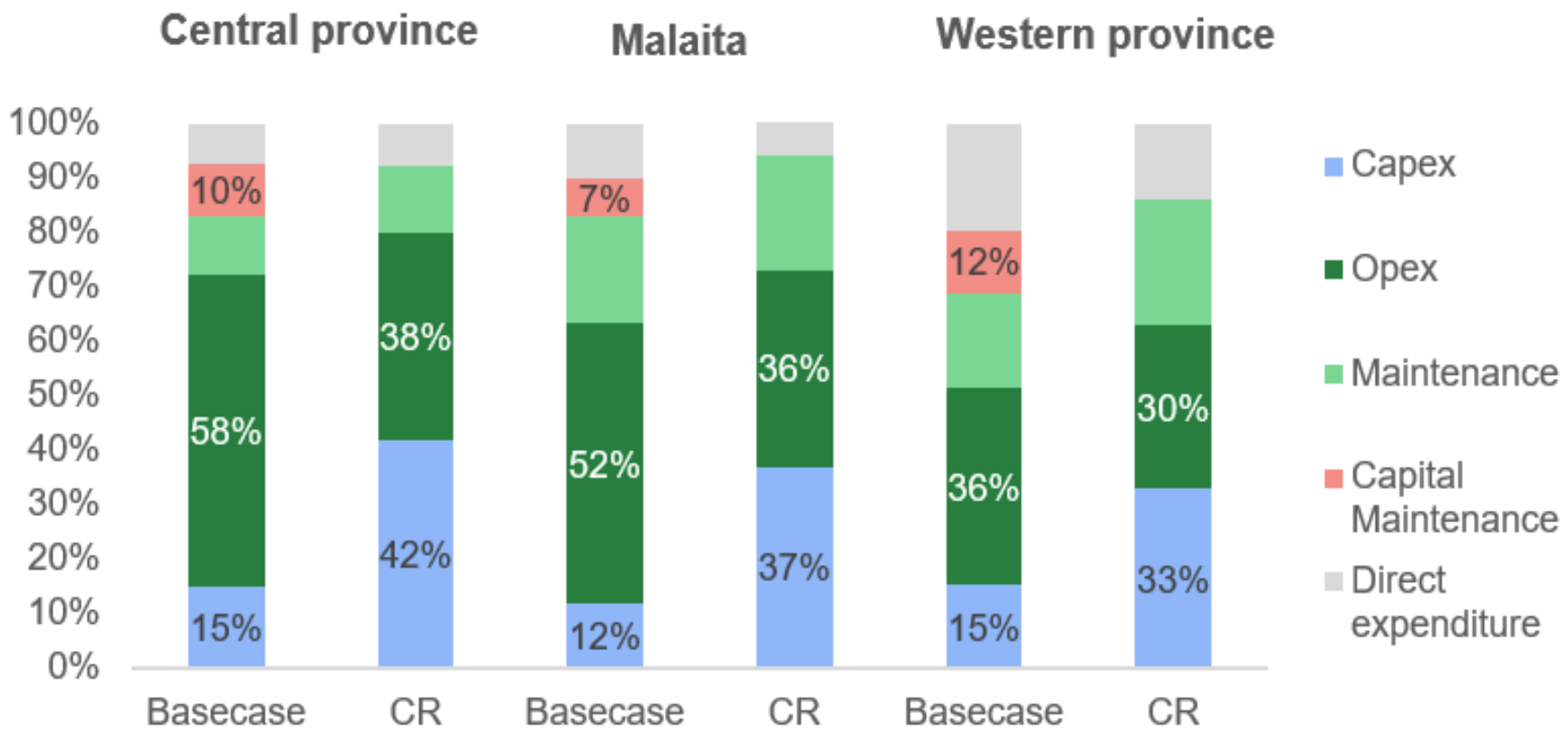
Across the three studies, households finance on average **92% of the CR lifecycle sanitation costs**.




This raises important concerns regarding **affordability and equity in sanitation financing.**

# **F5:** Although climate-resilient systems increase capital costs, they reduce capital maintenance needs and extend system lifespan.

**Example from Solomon Islands:**



# 04

# Policy implications

# Policy implications

- **Integrate Climate Resilience into Sanitation Planning**. Sanitation planning processes should systematically incorporate both lifecycle cost analysis and climate resilience considerations to ensure that sanitation systems **remain functional** under changing climate conditions.

- **Mobilize new financing mechanisms**. Given that climate-resilient sanitation systems are more costly than conventional systems, there is a need to identify innovative financing mechanisms that can support the delivery of safely managed and climate-resilient sanitation services.

- **Promote cost-effective and locally appropriate CR design solutions.** Encourage innovative approaches to designing climate-resilient sanitation systems that make use of locally available resources and materials. This can help keep costs manageable while still achieving resilience to climate-related hazards.

# Policy implications (2)

- **Reduce the financial burden on households**. Policies should prioritize mechanisms to reduce the financial burden on households, particularly for low-income populations.

- **Expand the evidence base**. Findings highlight the need for additional local-level costing studies, as the cost of climate-resilient sanitation varies significantly across contexts. Expanding the evidence base will help governments and development partners design more accurate budgets, financing strategies, and support with climate financing applications for sanitation such as through the Green Climate Fund (GCF)

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unicef

SNV Impact that matters

# More of our work

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We are keen to continue this important work so get in touch if you want to learn more or work with us…

# Thank You

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