

# Why are solar water systems failing in Vanuatu?

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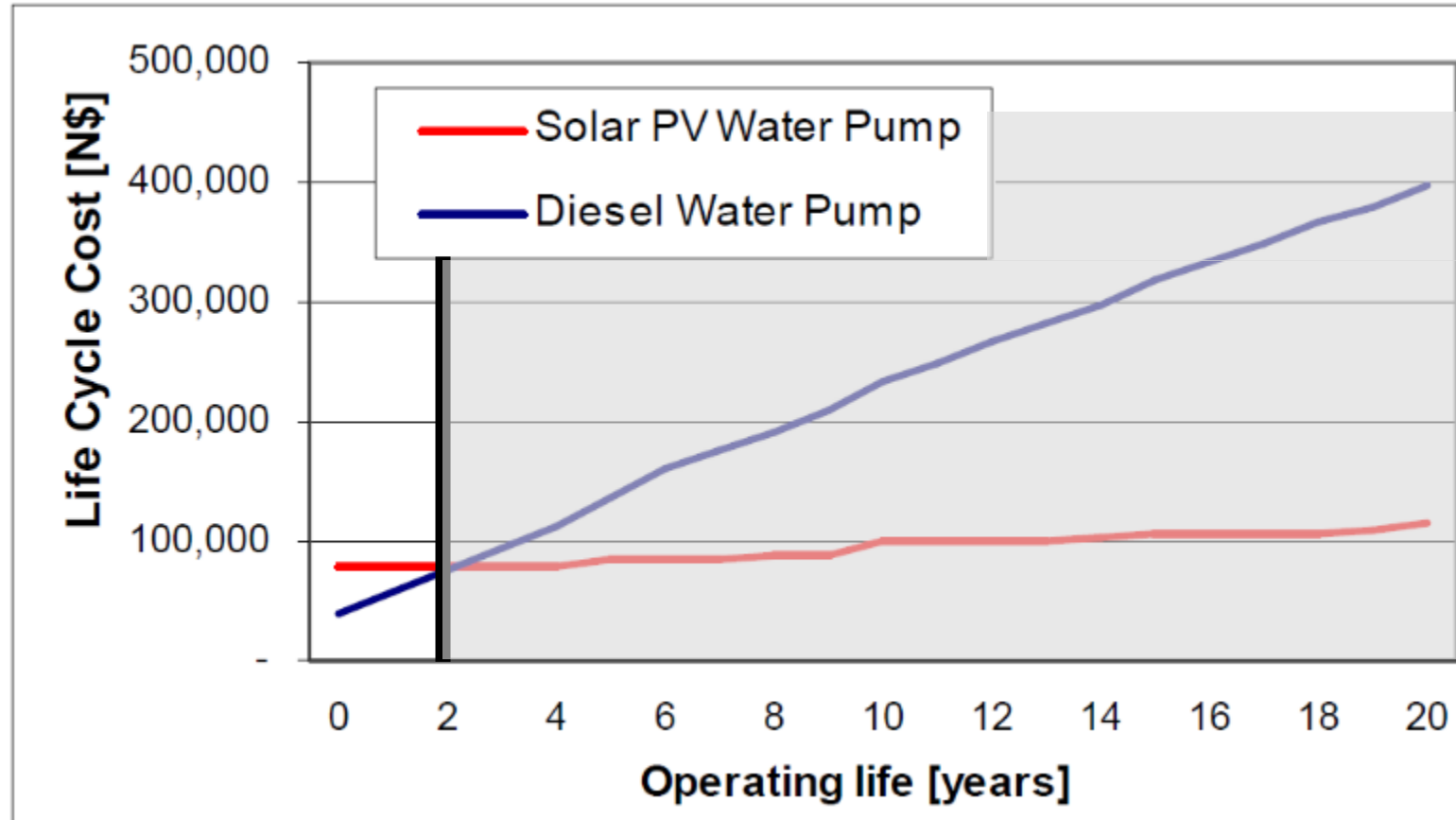
#WaWF23

# Big Nanuku & Avnavai



# Lifecycle assessment of solar water pumping systems

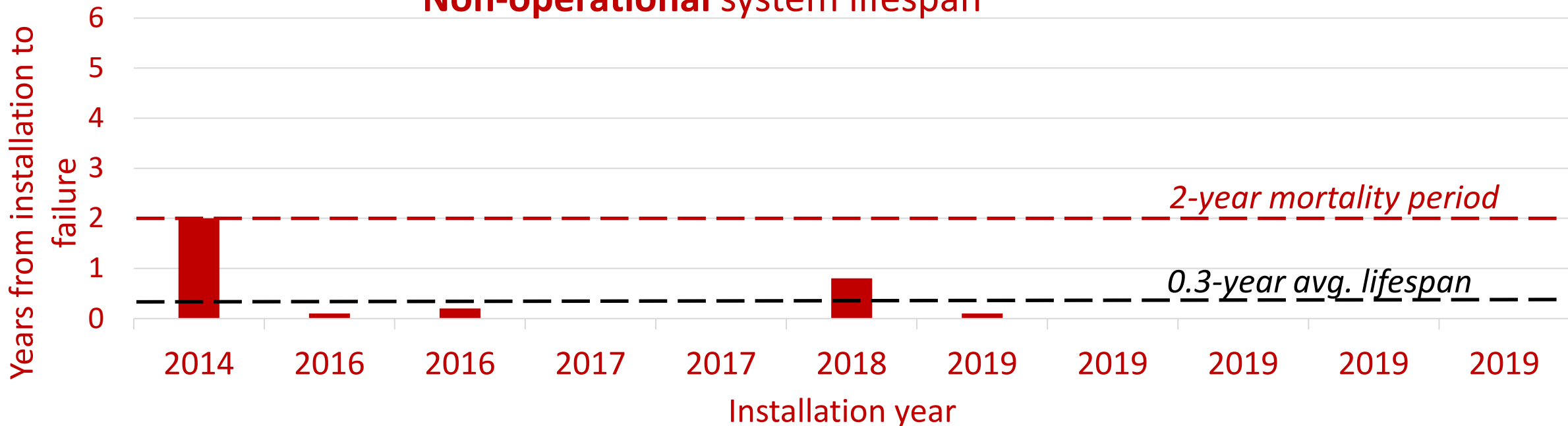
- 20 – 25 year lifespan of solar panels
  - Pump replacement every ~10 years
  - Controller replacement every 6 – 8 years
- Payback period of less than 4 years
- Solar vs. diesel breakeven point typically 0 to 4 years



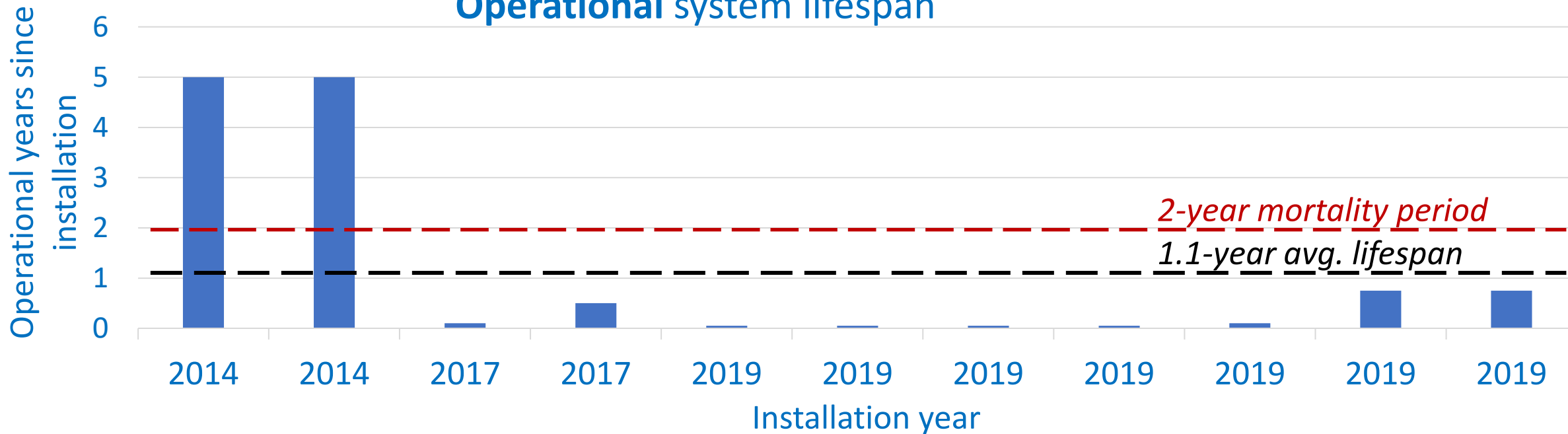
UNDP feasibility assessment, Namibia



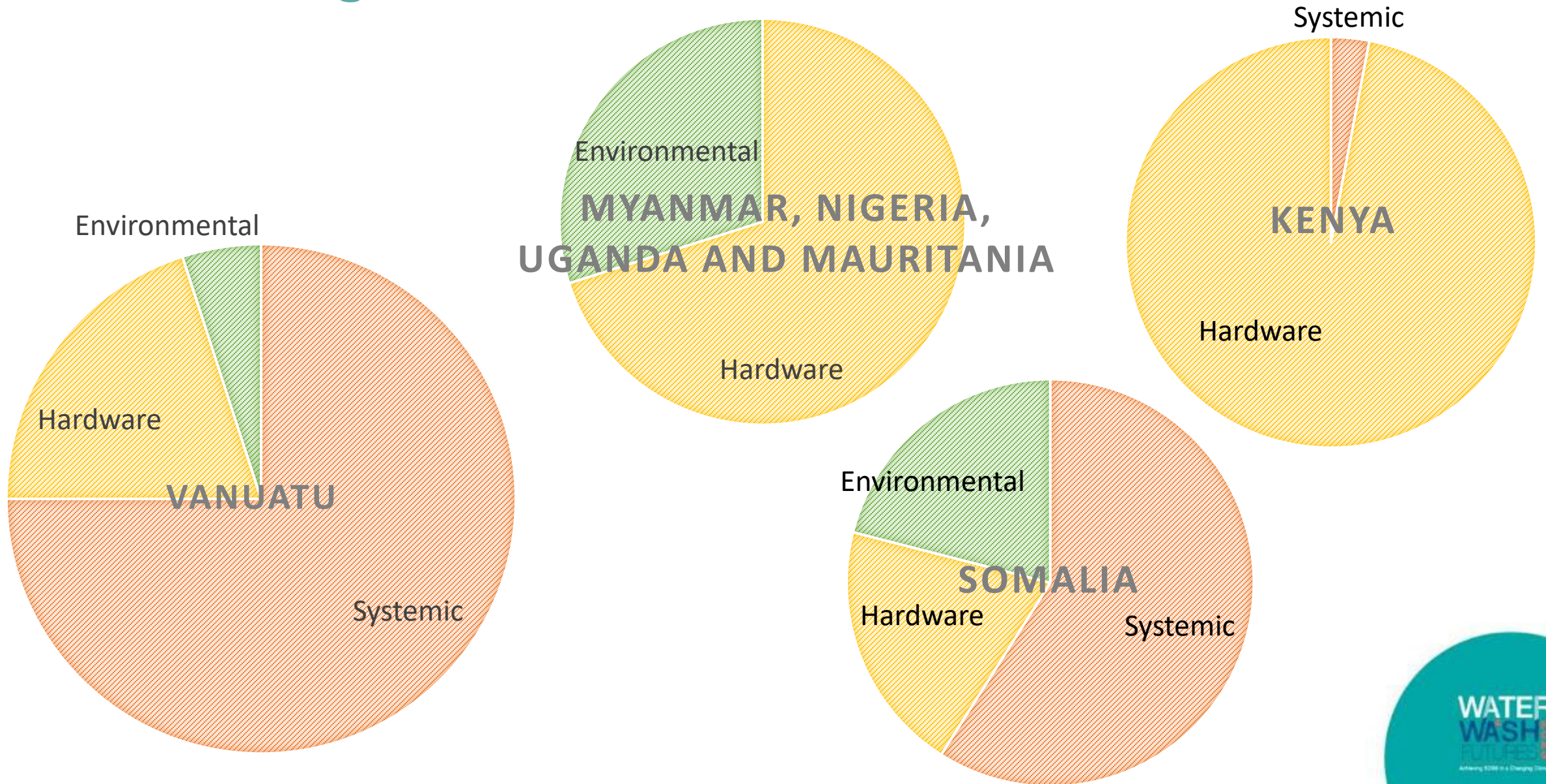
## Non-operational system lifespan



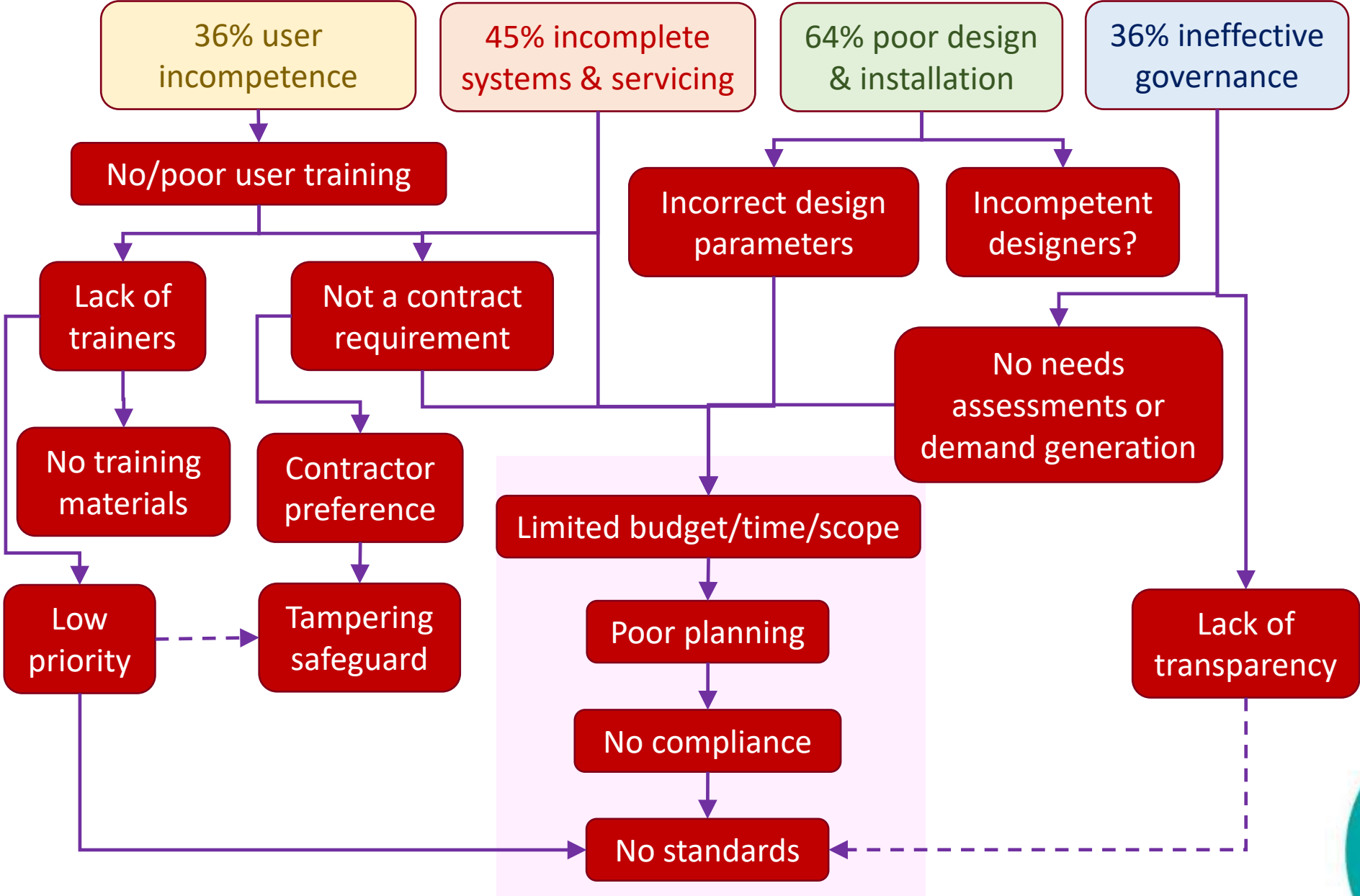
## Operational system lifespan



# Failure diagnostics



# Problem diagnosis



# Who should be liable for servicing?

## USERS

- Ownership
- Shorter downtime for minor faults
- No call-out costs
- Sustainability beyond outsourced servicing period
- Lower contract cost & duration

## CONTRACTORS

- Less tampering
- Expert advice/service
- Improved diagnosis & repair
- Less training expense
- Obligation to exceed mortality period
- Replicable & scalable

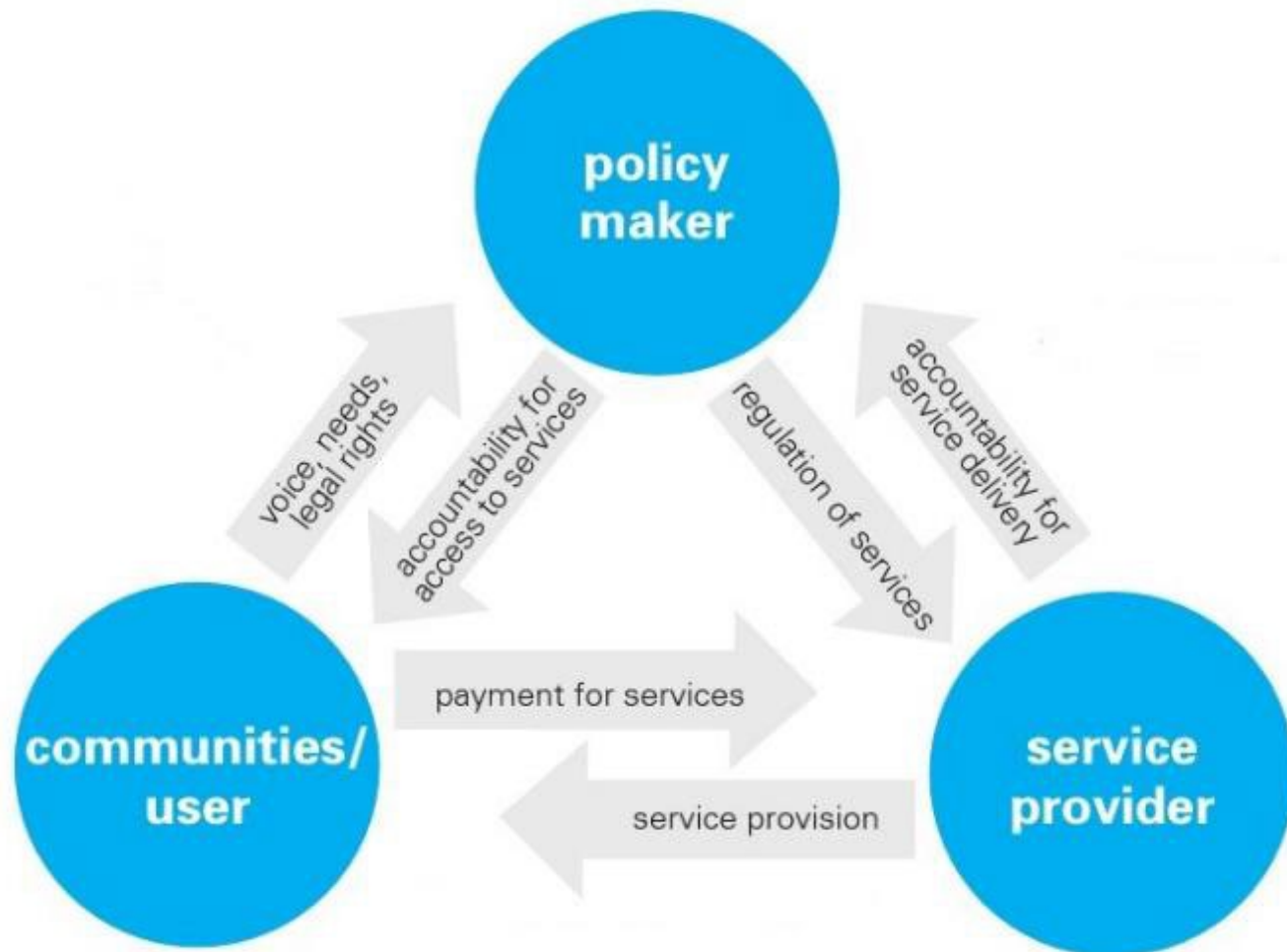
## GOVERNMENT

- Capacity building
- User-contractor liaison
- Permanence
- Monitoring & compliance
- Spares & resource sharing

*“A solar pumping scheme that works for the first 2 years will very likely work for many more”*

Global Solar and Water Initiative – 2018

# Way forward for Vanuatu



UNICEF/SIWI 2015

1. Standards for design, procurement, installation, operation and maintenance
2. Compliance protocol and funding
3. Mandatory 2-year defect liability period
4. User training for basic troubleshooting
  - With clearly defined user, contractor and government responsibilities



## From lessons learned to action (slide yet to be completed)

- GGGI solar pumping project: 22 systems installed in 2020/2021 and only 1 failure to date (<5%)
  - O&M and financial management training with each beneficiary community
    - Training manuals, face-to-face training and video tutorials
    - Troubleshooting training often not effective (basic issues unable to be resolved)
      - Most issues resolved easily over the phone with the supplier
- Development of standard design, procurement, installation and O&M documentation?
- Compliance protocol and funding?

“As the PV technology has matured, the confounding issues have increasingly centered on institutional factors, which are pivotal to project success or failure. In practice, this means that, during project formulation, greater attention must be paid to institutional frameworks and operational details for the post-project period (e.g., the minutiae of running costs, ownership, maintenance, and user controls), along with the usual attention given to project budgets, procurement, launchings, and disbursements.”



Africa Renewable Energy Access Program (AFREA) – 2010

# Tankyu tumas

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