

Integrating Climate Resilience to Strengthen Community-managed Water Supply Systems in Indonesia

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PAMSIMAS Project to Increase Indonesian Piped Water Coverage

- Penyediaan Air Minum dan Sanitasi Berbasis Masyarakat (PAMSIMAS) has been Indonesia's flagship **rural water supply and sanitation program** since 2007
- The project is supported by the Government of Indonesia, the **World Bank (WB)** and Australia's **Department of Foreign Affairs and Trade (DFAT)**.
- Benefitting more than **38,000 villages** with a total of more than **4.6 million household connection**⁴
- Extensive **monitoring information system (MIS)** and initial efforts to address women's leadership and participation and access to people with a disability

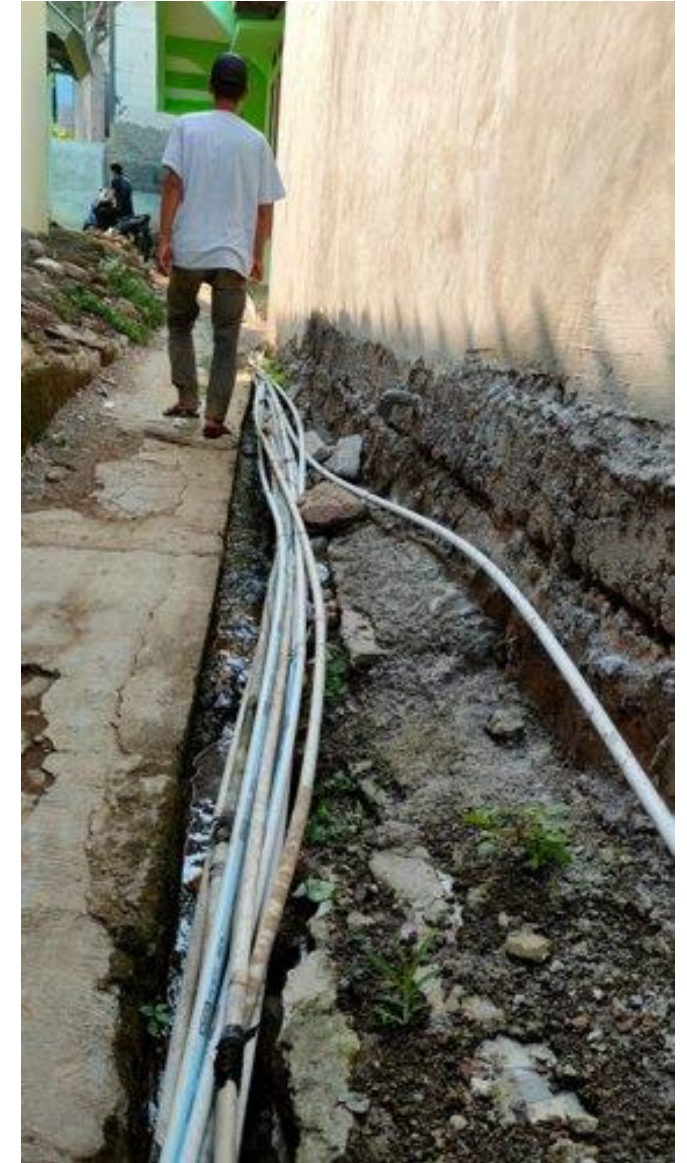
⁴ Pamsimas MIS data –2023



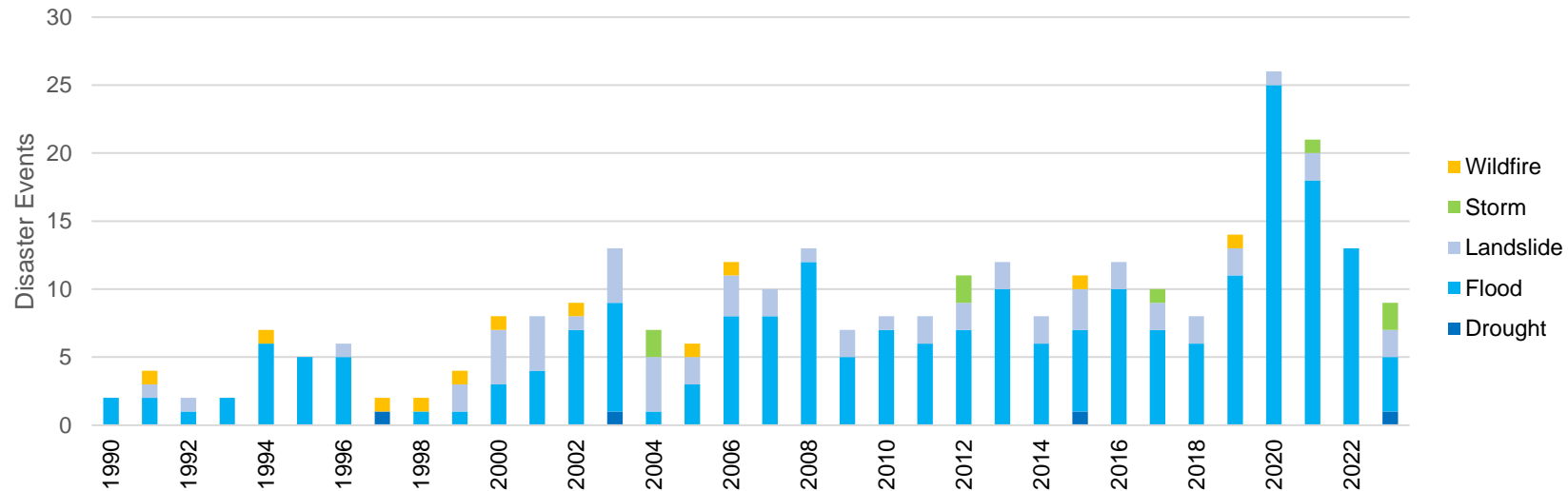
Existing Issues and Challenges in Indonesian Rural Water Supply

- Around **two-thirds of the rural population** (78 million) in Indonesia still lack access to piped water
- **Gender and inclusion** continue to require attention
- **Climate resilience** presents a new and emerging area of critical importance
- Indonesia, as one of the most disaster-prone countries in the world, would be **highly affected by climate change effects**
- More than 1,400 PAMSIMAS water supplies (3.73%) are **not functional** due to water scarcity, infrastructure damage, electricity problems, and social conflicts⁴

⁴ Pamsimas MIS data –2023



Rising Climate Threats in Indonesia



Source : International Emergency Events Database (EM-DAT), 2024



Source : [Detik.com](https://www.detik.com) - Deretan Fakta Longsor yang Tewaskan 2 Warga Subang

- The increase in frequency of climate-related disasters is expected to continue⁵.
- The poor and vulnerable—one-third of the population—are likely to carry a **disproportionate burden**⁶.
- Up to 30% **Intensification of rainfall** in provinces north of the equator and 15% **decline in precipitation** below the equator in 2080⁷.
- by 2050, 31% of Indonesia's districts will **experience water scarcity**⁸.

⁵ The World Bank, 2023 - Indonesia Country Climate and Development Report

⁶ Kompas et al., 2018 - The Effects of Climate Change on GDP by Country and the Global Economic Gains From Complying With the Paris Climate Accord

⁷ World Bank Climate Change Knowledge Portal, 2024 – Mean Climate Projections

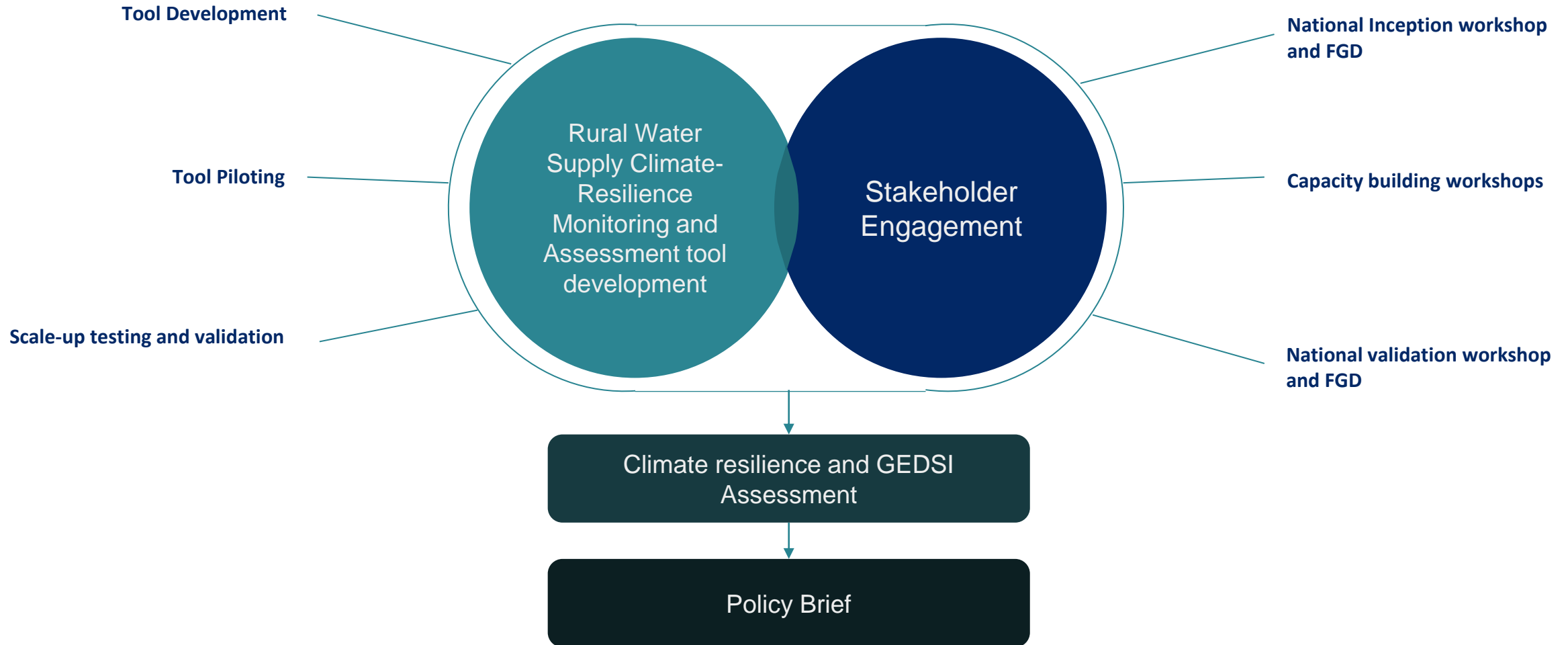
⁸ World Bank Group and Asian Development Bank, 2021 - Climate Risk Country Profile: Indonesia

Objectives

1. Development of a gender equality, disability, and social inclusion (GEDSI) -responsive, climate-resilient community-managed rural water supply **monitoring and assessment tool and procedure** to inform decision-makers about **specific vulnerabilities** and responses at the local level.
2. Integrating **climate resilience aspects** into the nationwide water supply monitoring and evaluation system.



Research Components



Tool Development

Framework

- Modified framework from The Indonesian Ministry of National Development (for RWS-CRMAT)
- How Tough is WaSH⁹ (For FGD-based assessment)

Theoretical Concepts

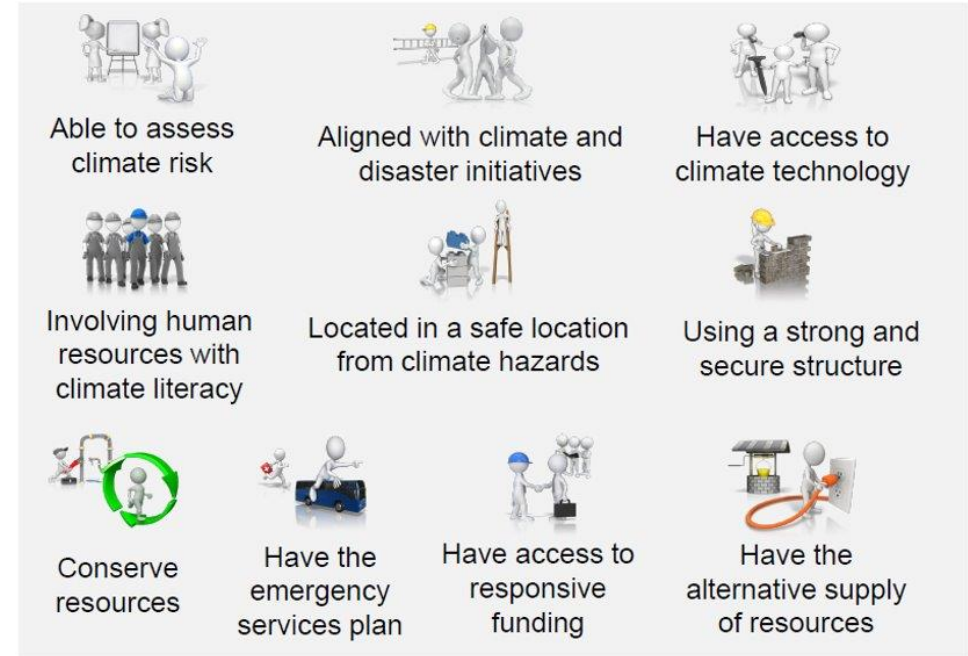
- Climate change adaptation perspectives: Risk-Hazard, socio-ecological resilience, and social vulnerability¹⁰
- Generic and adaptive capacity¹¹

⁵ Howard et al., 2021) The how tough is WASH framework for assessing the climate resilience of water and sanitation.

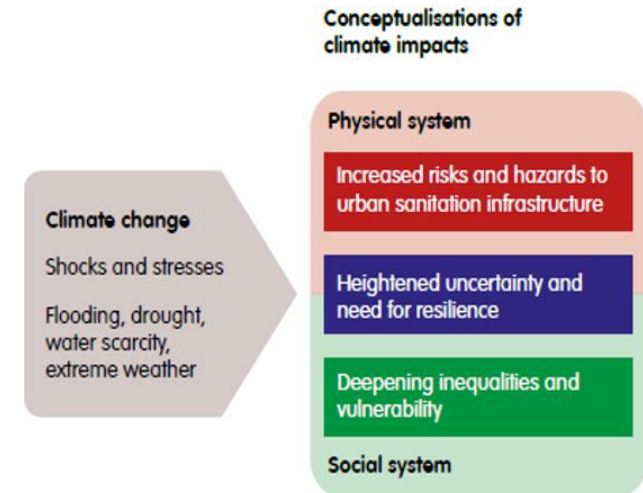
⁶ Kohlitz et al., 2017 – Climate change vulnerability and resilience of water, sanitation, and hygiene services: a theoretical perspective

⁷ Eakin et al., 2014 - Differentiating capacities as a means to sustainable climate change adaptation

10 Features of a Climate-Resilient Water and Sanitation System



Source : Bappenas, 2023



Source : ISF-SNV, 2023 – Considering climate change in urban sanitation

Data Collection Methods

Qualitative Assessment

- Semi-structured interviews with community-based water groups (KPSPAMS) that consists of open-ended questions
- Focus group discussions with the users and non-users of PAMSIMAS

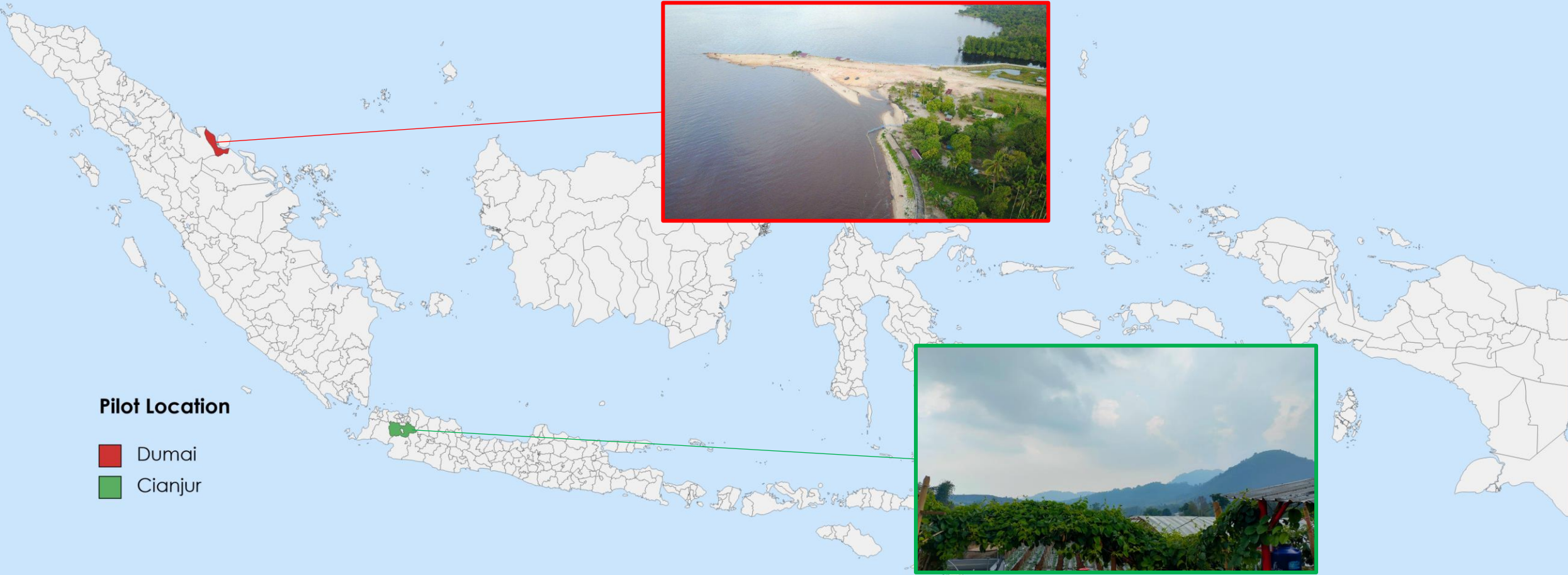


Quantitative Assessment

- Close-ended questions designed to be filled by a group of KPSPAMS members for monitoring purposes



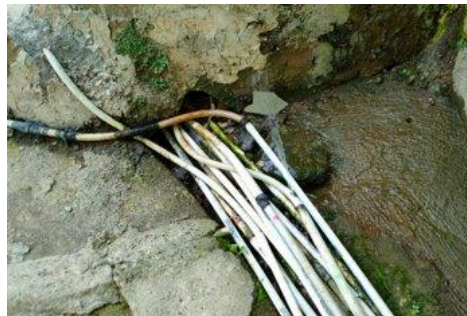
Pilot Locations



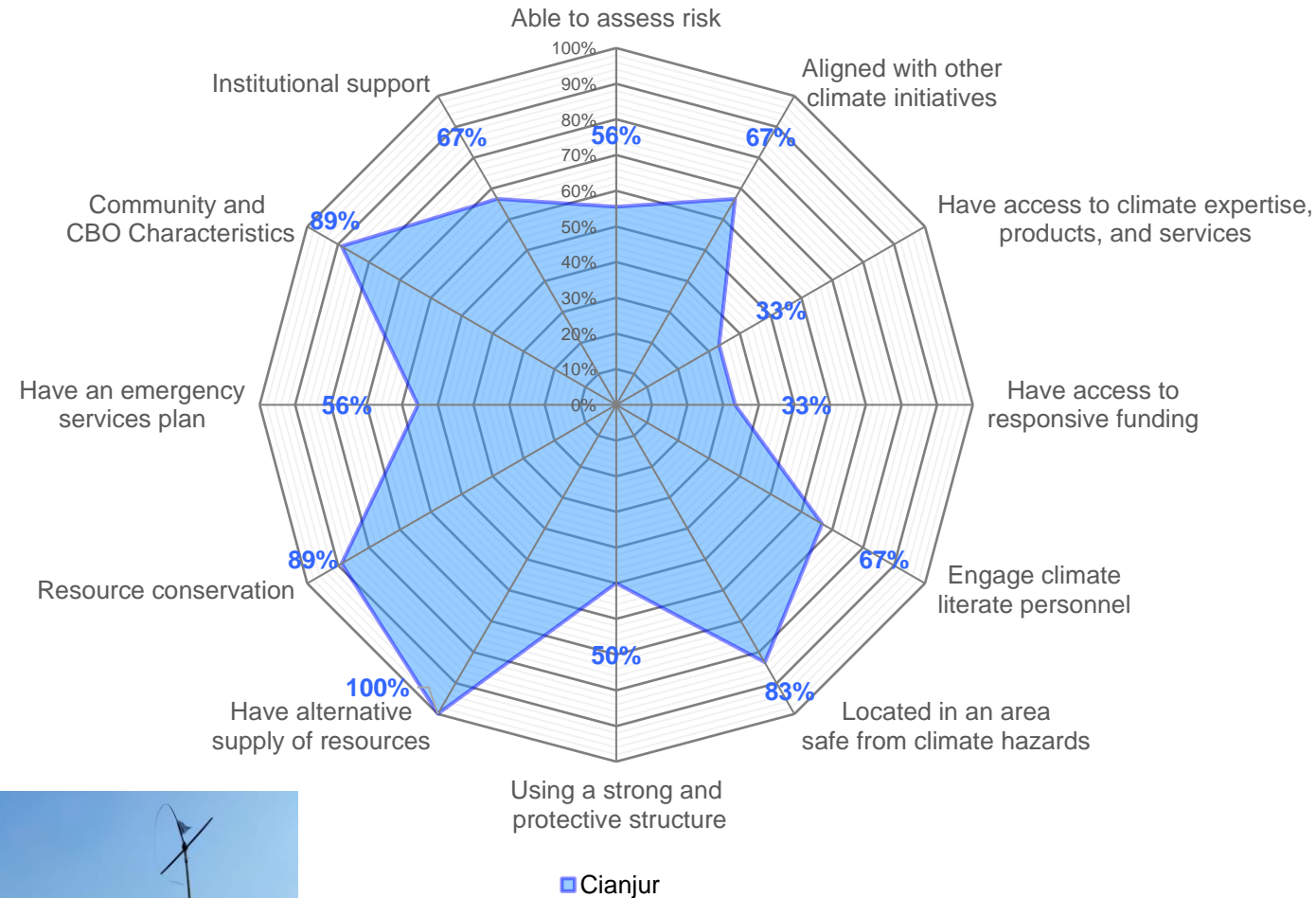
Cianjur Resilience Score

Cianjur

- This hilly region faces the threat of **landslides due to heavy rain events**
- **Emerging key issues:**
 - No external funding after construction
 - Water tariffs cannot cover maintenance costs
 - Lack of emergency response plan
 - Lack of access to technical expertise



Key Resilience Indicators Score



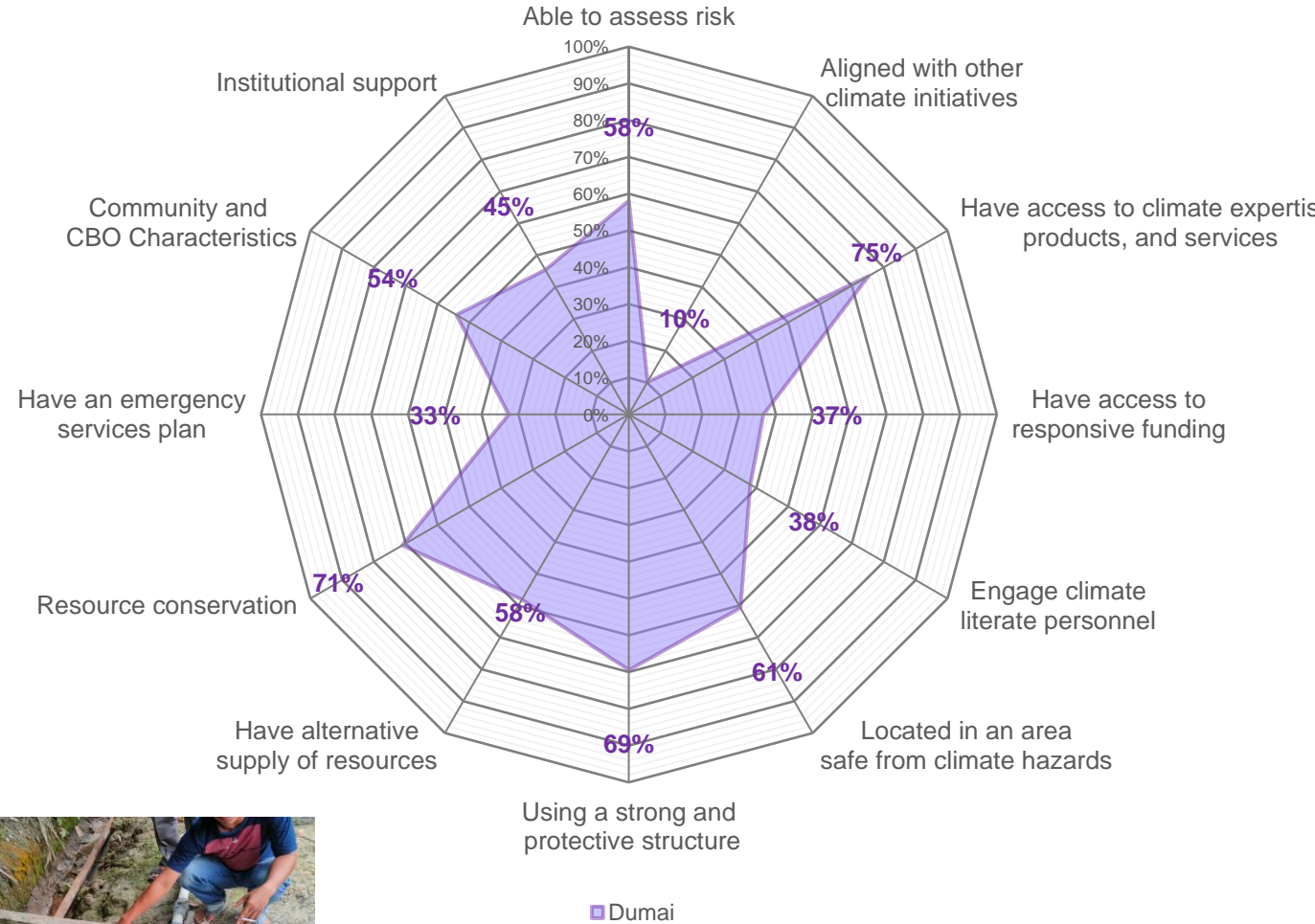
Dumai Resilience Score

Dumai

- This coastal region faces the threat of **drought and coastal flooding**
- **Emerging key issues:**
 - No coordination with other agencies
 - Lack of emergency response plan
 - Lack of access to emergency funds
 - Lack of training, especially climate-related
 - 4/9 PAMSIMAS had high sanitary risk



Key Resilience Indicators Score



Gender Dynamics Within the CBO and Community



- Female KPSPAMS members are **not directly involved in technical aspects.**
- Female members are **not included in village or city-level meetings.**
- **Unequal opportunity for training** compared to male members
- Male members perceive female members to **not influence the decision-making process.**
- Women users tend to be the **first ones to notice and report any disturbance**



Arising Conflicts Within the Community

- Most problems that the KPSPAMS encountered revolve around **social conflicts**.
- The social conflicts that we encountered were:
 - **Distrust** of KPSPAMS due to unfulfilled promises, nepotism, and privatization
 - **Conflicts** between villagers due to water scarcity
 - **Social jealousy** of different treatment (e.g. connection fee subsidy for poorer households)
 - The use of personal pumps connected to the PAMSIMAS network **without permission**
 - **Water stealing** from community tap stands



Climate Resilience and Risks

PAMSIMAS vs Other water supply

- Drought causes private shallow wells to go dry
- Private wells are prone to saltwater intrusion
- PAMSIMAS is available for 24 hours most of the time
- PAMSIMAS suffer breakage more often
- PAMSIMAS monthly cost is cheaper

Present Risks in PAMSIMAS

- **Technical** : limited network coverage, frequent breakage of water supply infrastructures (e.g. water meter, pipe, pump), diminished water quantity in long dry seasons.
- **Non-Technical**: High installation cost (13-32% of the region's minimum wage), social conflicts, lack of emergency plan.

Differences between well water and Pamsimas



Well water



Pamsimas

Efforts to Increase Resilience

- **Emergency water supply** bilateral agreement with PDAM
- Catchment area **afforestation**
- Using **coastal-flood-proof** piping material
- **Emergency funds** from water tariffs
- Establishing connections with **pump and pipe repair services**
- Formation of regional **KPSPAMS association**
- Suggestion to build **household-level water storage** from the women within the community.



Source : perhutani.co.id, 2024 - Perhutani Bersama Green Ambassador Adakan Penanaman Bersama di Cianjur



Next milestones

- **Scale-up testing** and validation through self-assessment test by the KPSPAMS
- **National validation** workshop and FGD.
- **Integration** of RWS-CRMAT to the nationwide water supply monitoring and evaluation system.

Reflection and Recommendation

- The monitoring system should also include **social aspects**.
- **Financial planning training** or incentives might be needed for PAMSIMAS which is struggling financially.
- The need for **climate-resilience integration** into the existing PAMSIMAS development scheme.
- Need for **capacity development** regarding climate change and emergency plans.
- Mandatory **inclusion of women members** in training and women member-specific training.

Thank You

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