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Climate Resilience Pathways:

Water Security and WASH in Asia Pacific

Supporting climate resilience and water security through Nature-based Solutions in the Pacific

THURSDAY 1ST MAY 2025, 11AM

WaterAid

Pacific Community
Communauté du Pacifique

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ENVIRONMENTAL EDUCATION

Wildlife Conservation Society

KIWA INITIATIVE
Nature-based solutions for climate resilience

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Introduction to supporting climate resilience and water security through Nature-based Solutions in the Pacific

Dr. Rebecca Stirnemann, SPC

Pacific Community
Communauté du Pacifique

KIWA INITIATIVE
Nature-based solutions for climate resilience

What are nature-based solutions?

Nature Based Solution (NBS) are defined by IUCN as "*actions to protect, sustainably manage and restore natural or modified ecosystems that address societal challenges effectively and adaptively*"

NBS must answer to <u>at least</u> one of the following societal challenges:

- CC mitigation and adaptation
- Disaster risk reduction
- Economic and social development
- Human health
- Food security
- Water security
- Environmental degradation and biodiversity loss

NBS must deliver BOTH Human well-being and Biodiversity benefits

Examples of NbS application:

Protection, restoration and sustainable use of forest landscapes

Secures water supply, erosion control and risk reduction

Protection or restoration of coastal ecosystems

Brings community resilience, disaster risk reduction, economic development

Providing space for rivers to naturally flow

Enables flood protection, water security

Protection, restoration and management of wetlands

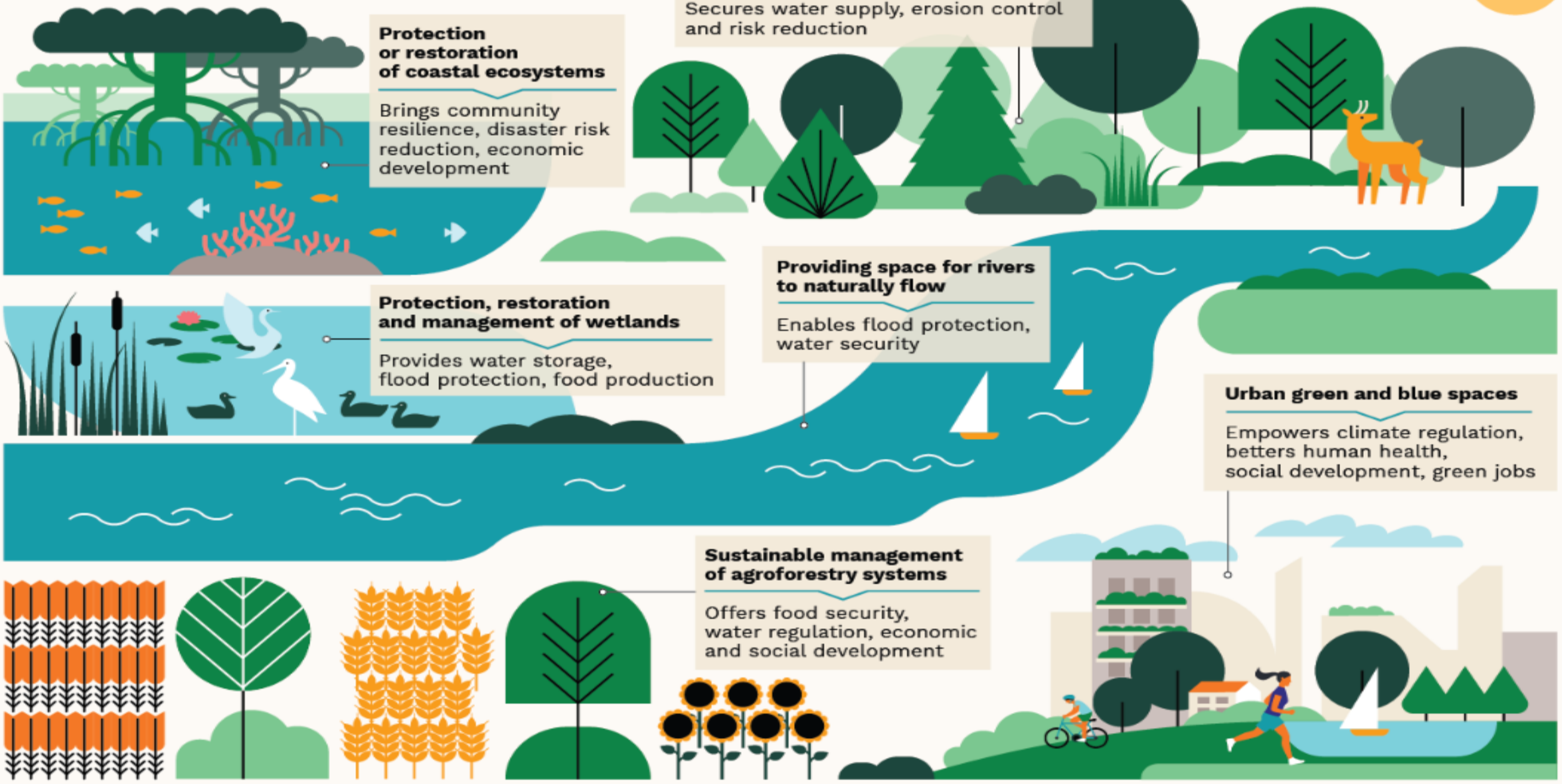
Provides water storage, flood protection, food production

Urban green and blue spaces

Empowers climate regulation, betters human health, social development, green jobs

Sustainable management of agroforestry systems

Offers food security, water regulation, economic and social development



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✅ Key Characteristics of Good NBS:

- Work with nature, not against it.
- Provide multiple benefits—climate resilience, biodiversity, water security, etc.
- Are locally appropriate and involve community participation.
- Focus on long-term sustainability.
- Enhance or restore ecosystem functions (not just appearance).

The need for NBS pacific solutions

- Unique climate and water security challenges (e.g. droughts, floods, saltwater intrusion, limited freshwater lenses)
- Socio-economic and environmental vulnerabilities

Enhancing climate resilience and water management

- There are many NBS options
- Multiple NBS solutions yields better performances than a single type.

Reforestation & Agroforestry

Riparian Buffer Zones

Wetland & Mangrove Restoration

Traditional Agriculture

Floodplain & River Reconnection

Green Infrastructure (Urban)

Cover Cropping & No-Till Farming

Check Dams & Erosion Control

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NBS Type	Purpose	Pacific-Specific Pros	Challenges	Effectiveness
Reforestation & Agroforestry	Restore forests, stabilize slopes, enhance food security	Uses native species, integrates crops, supports food systems	Limited land, long-term maintenance	★★★★☆
Riparian Buffer Zones	Protect streams, reduce sediment to reefs	Preserves aquatic life, reduces reef degradation	Land ownership disputes, space constraints	★★★★★
Wetland & Mangrove Restoration	Buffer coasts, filter runoff, support fisheries	Natural flood control, nursery habitat	Development pressure, slow recovery	★★★★☆
Traditional Agriculture	Control runoff, retain soil	Culturally aligned, low-tech, effective on slopes	Labor-intensive, needs community commitment	★★★★☆
Floodplain & River Reconnection	Restore natural water flow	Flood reduction, sediment management	Terrain challenges on small islands	★★★★☆
Green Infrastructure (Urban)	Manage urban runoff	Scalable in towns, community involvement	Limited reach in informal settlements	★★★☆☆
Cover Cropping & No-Till Farming	Reduce erosion on slopes	Simple, low-cost, supports soil health	Needs outreach for adoption	★★★★☆
Check Dams & Erosion Control	Slow runoff in uplands	Uses local materials, supports community-led efforts	Small-scale, requires regular maintenance	★★★☆☆

Are all NBS beneficial?

Potential Downside	Explanation
Land Use Conflicts	NBS often require land (e.g., for forests, wetlands), which can displace farming, housing, or traditional land uses.
Displacement or Loss of Livelihoods	Restoring wetlands or forests might limit access to areas people rely on for income or food.
Slow Impact	Ecosystems take time to regenerate; benefits (e.g., flood control, carbon capture) may not be immediate.
Cost and Maintenance	Some NBS (like wetlands) require high up-front investment and long-term maintenance to remain effective.
Poor Design or Misalignment	If NBS are poorly designed or not suited to the local ecosystem, they may fail or even harm biodiversity.
Greenwashing Risk	Governments or companies may use NBS as a PR tool while continuing harmful environmental practices elsewhere.
Equity and Inclusion Issues	Projects may ignore or exclude Indigenous peoples or local communities from decision-making.

Making sure the NBS is the right choice

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Safeguard Type	Purpose
Environmental Assessments	Ensure NBS won't damage local biodiversity, water cycles, or ecosystems.
Social Impact Assessments	Evaluate effects on local communities, including access, culture, and livelihoods.
Inclusive Planning	Involve local and Indigenous communities in project design and governance.
Monitoring & Adaptive Management	Track performance, adjust over time to avoid unintended outcomes.
Land Tenure Clarity	Respect and clarify land rights before implementing restoration projects.
Transparency and Accountability	Prevent misuse of "nature-based" labels for greenwashing or funding misuse.

Making sure the NBS is the right choice

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"Don't be discouraged by the challenges—Nature-based Solutions are often the most effective and appropriate choice for building climate resilience."

Thank you

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Practical NbS lessons from across the Pacific: Timor-Leste

Huger Freitas (Plan International) and Meredith Hickman for Tara Bartnik (WaterAid)

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"Water Resource Management Through Nature-Based Solutions (NbS)"

Australian Aid

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Until we are all equal

RURAL YOUTH ACTION R Y A

Upstream Use Downstream Impact:

Established artificial ponds and conserve natural ponds in hilly upstream areas, Using a rainwater harvesting method

Introduced locally made check dams using eco-friendly materials like wood and vegetation

Planted trees around spring water sources

Upstream Use Downstream Impact:

Volume= Length × Width × Depth

6 × 4 × 1 = 24 Cubic meters

Water it can store: 24 m3 × 1,000 = 24,000 liters

Encouraging Behavior Change for Long-Term Impact:

- Raising awareness and building understanding on the importance of protecting natural water sources
- Integrating Traditions and Local Knowledge.
- Promoting peer learning between Villages, where communities inspire and support each other through shared experiences.
- Encouraging collective ownership and responsibility for managing and maintaining water sources.

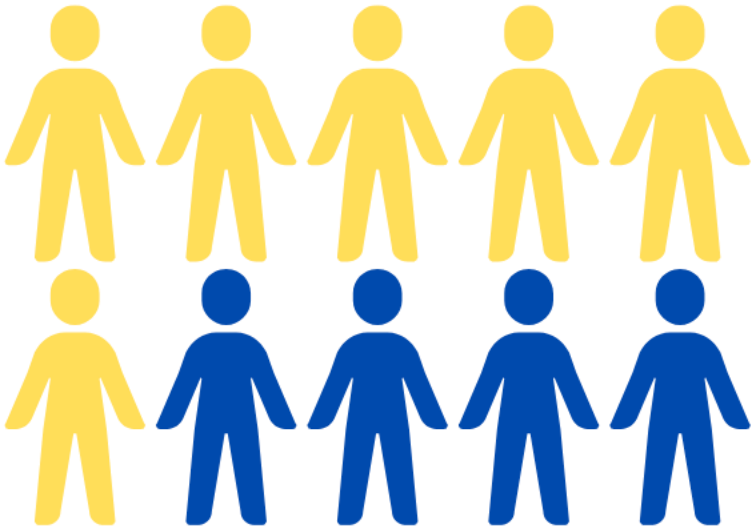
Inclusive Participation for Stronger Water Governance:

- Recognizing women and youth as key users of water.
- Promoting their involvement in community decision-making structures like water user committees (GMFs).
- Building capacity through leadership, public speaking, and technical training in water conservation and governance.
- Promoting role models especially Women and PwD who lead local initiatives in managing their water source.

Linking Water Management Facilities with Financial Services:

- Providing training to GMF on managing water systems, maintenance, and local governance of water sources.
- Supporting communities with financial services establishment like Village Saving and Loan Associations (VSLAs).
- Encouraging collective savings to support long-term investment in water infrastructure and resource management.

Impacts:



- Increased awareness and capability among community and local leaders on spring water conservation using the NbS approach.
- Established 42 ponds and 103 check dams on hilly areas, contributed to the preservation of 23 water springs, and estimated to benefit 1067 households in Aileu and Ainaro.
- Planted 6,855 tree seedlings, promoting reforestation, enhancing water catchment areas, improving soil stability, and boosting biodiversity
- Successfully reactivated 11 Water User Groups (GMFs), which have collectively accumulated $1,310 in funds for water system maintenance and repairs.
- A total of three women have been nominated or elected as group chiefs, and 17 women have been appointed as treasurers and secretaries.

Obrigadu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Until we are all equal
RURAL YOUTH ACTION
R Y A

Climate change impacts in Timor-Leste

"*To be honest, during the long dry season we have less water and it can have a big impact on our community. Sometimes it creates conflict because there is not enough water for everyone in the village.*"

- Estanislao Borges, Xefe Suco Bubussusu

Challenges for rural water management, innovative locally based partnerships as the solution

- Water use rules set by committee were having a limited effect
- Irregular monitoring and a low level of information flowing from community to local government and supporting NGOs
- Achieving and maintaining water quality
- Siloed initiatives across WASH, WRM, DRR, environment, agriculture…

Innovative locally based partnerships as the solution

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WaterAid

Sustainable and scalable WASH governance systems, and behaviour change, locally-led solutions for low resource settings, strengthening local to national pathways

PERMATIL

Permaculture nature-based approaches to rehabilitate the local environment, including retention ponds, check dams, terracing, planting.

similie

Innovative and appropriate technology to accelerate change, including hydrometeorological monitoring system (All-Weather Stations, equipped with a soil moisture sensor) and water supply monitoring systems (water level sensors in tanks and water flow meters)

Community understand, apply, and maintain the interventions

"The benefits that we get from the retention pond are that during the rainy season, the retention pond will accumulate the rainwater, which is then infiltrated into the soil to help recharge the water source."

Elisa Goçalves, Hatuquese

"The program has 2 main benefits. First, accumulated rainwater from retention ponds and check dams flows to water source. Second, the program helps to minimize risk of natural disaster."

Estanislao Borges, Xefe Suco Bubussusu

"The water and land conservation training opened my mind. I realise that the materials we need are all around us – stones, wood and soil."

Strengthening traditional and formal governance

- Village *Tara Bandu* laws were altered to integrate water resource management (WRM) and Gender equity and social inclusion (GEDSI) best practices at the community level.
- This project focused on integrating water protection and reducing unsustainable community practices into the existing village *Tara Bandu* to support community accountability and attempt to regulate harmful environmental practices.

- In both districts, the project leveraged strong coordination mechanisms have been established between local Village GMFs and municipal government staff.
- This has prompted broader activities beyond the initial project scope of activities, eg the Municipal Agricultural Services under the Department of Forestry and Environment to provide additional seedlings to support community reforestation activities in Bubususu, and scaling across to other communities and districts

"as part of our responsibilities to strengthen our communication mechanism, we are thinking to continue to coordinate with the ministry of agriculture and fisheries to provide us with the seedling... [we will] facilitate community plants around the retention ponds to keep the water and minimize the risk of landslide and sedimentation downstream from the conservation activities we had with our communities as part of environmental restoration" Loidahar, the Chefe de Suco

Emerging results

- Repurposed land to establish new reservoirs or retention ponds within upstream areas of the catchment, building terraces and planting trees around the catchment to capture rainwater in the wet season. Captured rainwater then infiltrates into the ground and recharges neighbouring springs, giving communities improved access to clean water during dry seasons. 36 retention ponds, 167 check dams, 52 terraces constructed
- Tree planting was designed to reduce erosion and landslides by stabilising the soil and increasing biodiversity. 2,222 trees planted
- Sub-national stakeholders from the agricultural, forestry and water resources ministries, civil protection authorities, village committees and local CSOs are engaged to help drive community leadership and decision-making capacity.
- Improved availability of water, including in the dry season

"*In the past the community did not use toilets because [there was] no water, now the majority of the community use toilets because the water is sufficient"* - Chefe de Suco (village chief), Bubususu

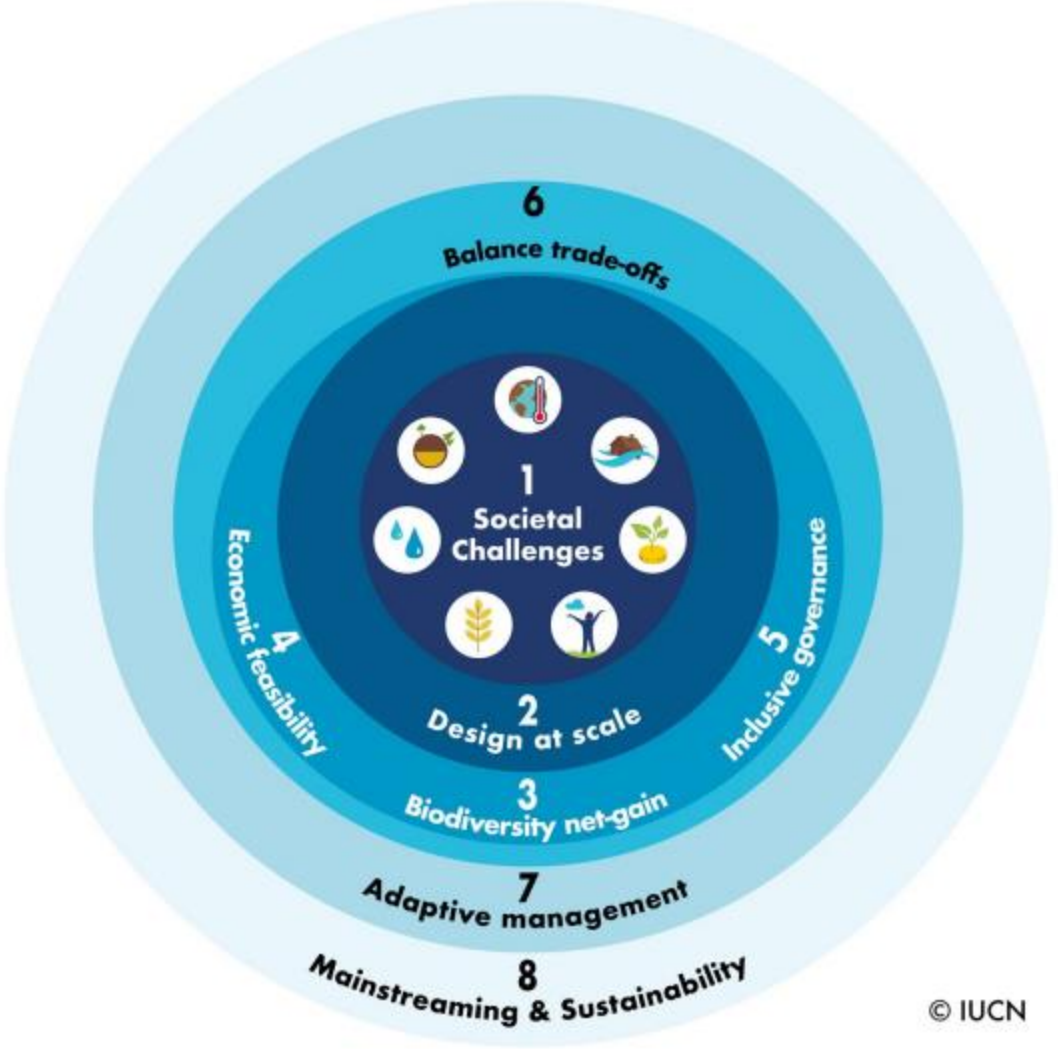
"The village is more green"

"Before … during the long dry season we experienced less water. But now that our water flow is more stable, we can now take a shower and grow vegetables as we want."

- Susanna Dos Santos, Loidahar community

Assessment Against IUCN Global Standard, and Challenges

- The Global Standard is universal
- The Global Standard asks very specific questions
- The Global Standard is not a pass or fail – identifies opportunities for improvement
- The Global Standard aims to provide benefits for HUMANS and BIODIVERSITY
- This all changes our scoring



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Practical NbS lessons from across the Pacific: WISH in PNG and Fiji

Alice Latinne, Wildlife Conservation Society

Wildlife Conservation Society

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WISH

Watershed
Interventions
for
Systems
Health

The WISH approach

Interventions:

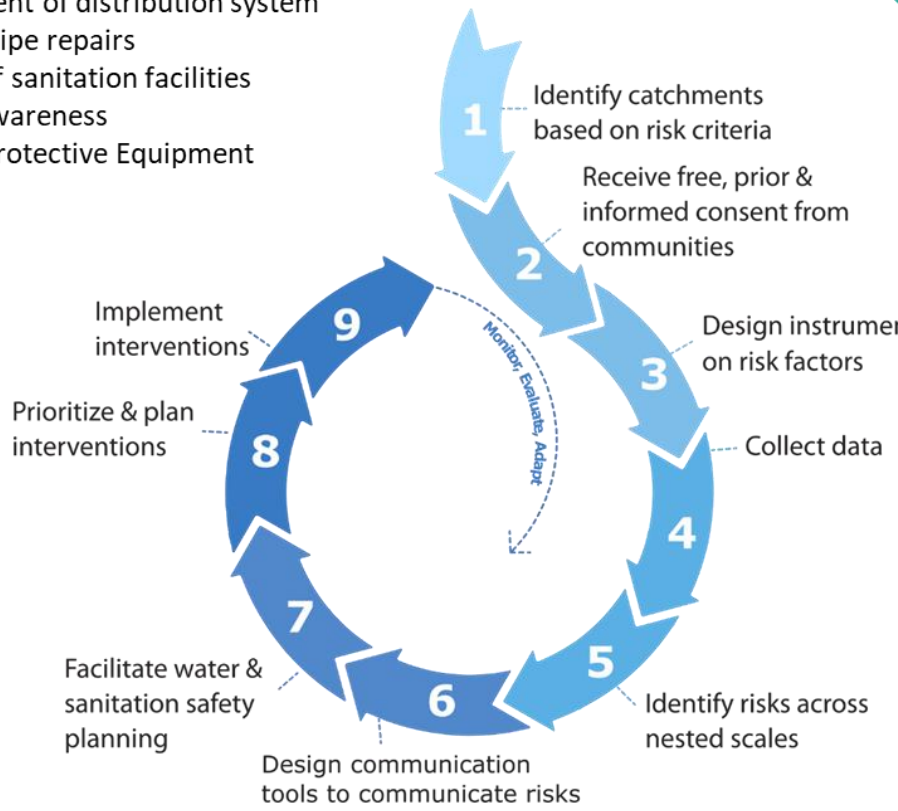
Nature-based Solutions (NbS) +

- Tree nurseries
- Riparian vegetation restoration
- Forest protection and restoration around water sources
- Protected area establishment
- Soil conservation through improved agriculture practices
- Sediment socks

Water, Sanitation and Hygiene (WaSH) infrastructure improvement

- Water tanks
- Improvement of distribution system
- Dam and pipe repairs
- Upgrade of sanitation facilities
- Hygiene awareness
- Personal Protective Equipment

Water and Sanitation Safety Plans (WSSP)



Ecological monitoring:

- Water quality
- Coral reef health
- Soil quality

Human health and well-being

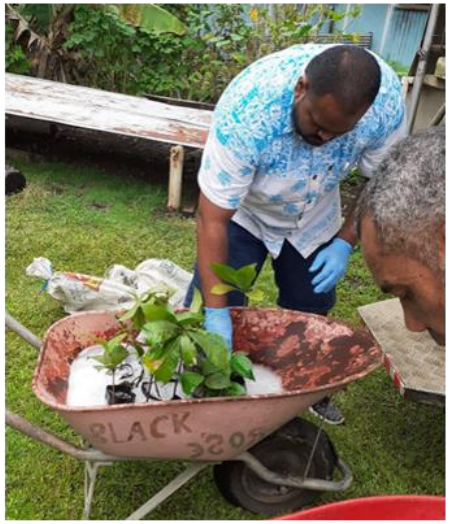
WISH in Fiji

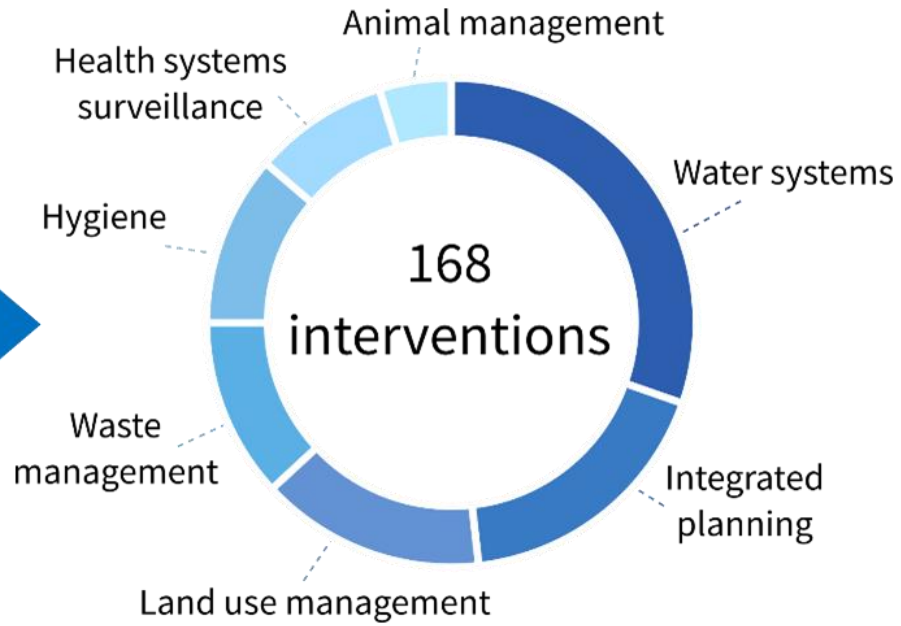
29 communities in Fiji

5 watersheds

29 Water & Sanitation Safety Plans

339 priority risk reduction actions identified





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Nature-based Solutions (NbS)

- Riparian vegetation restoration
  - **3,800 trees planted in 2022**
  - **8,000 trees planted in 2025**
  - More to come
- Forest protection and restoration around water sources
  - **1,364 ha protected**
  - More to come
- Riverbank stabilization
  - **Vetiver grass planted in 4 communities**
- Soil conservation through improved agriculture practices
- Sediment socks
- Tree nurseries

WISH in Fiji

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Follow-up monitoring indicated reduced risks in several communities against specific risk factors linked to water-related diseases and environmental health that may at least partially be attributed to project interventions.

RISK FACTOR	INTERVENTIONS	NUMBER OF COMMUNITIES IN EACH RISK CATEGORY	High	Medium	Low
 Drinking water supply	Existing dam repaired & pipes fixed connecting dam to reservoir Installation of air valves & washouts on main line	2019	4	19	6
		2022	1	21	7
 Piped drinking water quality (*E. coli*)	Replacement of damaged pipes Replacement of broken, exposed pipes Improvement works to distribution systems	2019	8	9	12
		2022	3	10	16
 Washing hands before cooking	Distribution of WASH kits Distribution of hygiene practice pamphlets Awareness about disease transmission	2019	2	12	15
		2022	1	4	24

RISK FACTOR	INTERVENTIONS	NUMBER OF COMMUNITIES IN EACH RISK CATEGORY	High	Medium	Low
 River water quality (*E. coli*)	Fencing of reservoir	2019	12	9	6
		2022	8	5	11
 Primary drinking water source quality (*E. coli*)	Riverbank stabilization through vetiver grass planting	2019	7	10	11
		2022	1	11	16

WISH in Papua New Guinea (Manus Island)

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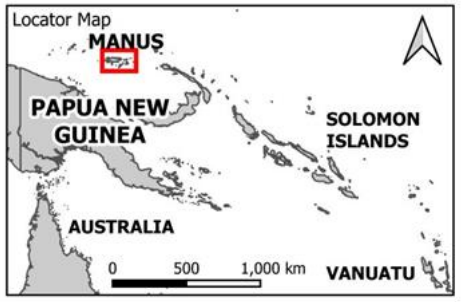
9 communities on Manus Island



4 watersheds

9 Water & Sanitation Safety Plans being developed

Priority risk reduction actions being identified

Nature-based Solutions (NbS)

- Community-based forest management through conservation deeds
  - **6,345 ha protected since 2021**
- Vanilla farming
- Riparian vegetation restoration
- Riverbank stabilization
- Soil conservation through improved agriculture practices
- Tree nurseries

WISH in Papua New Guinea (Manus Island)

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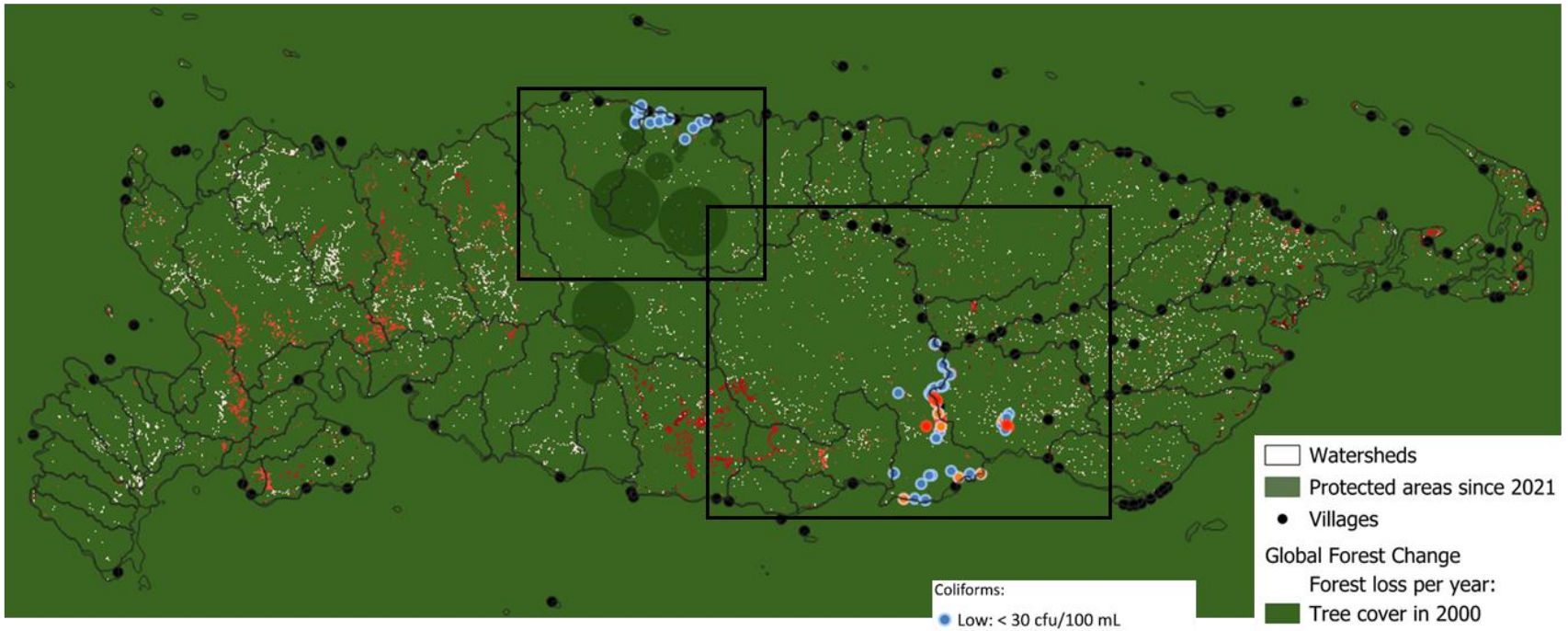
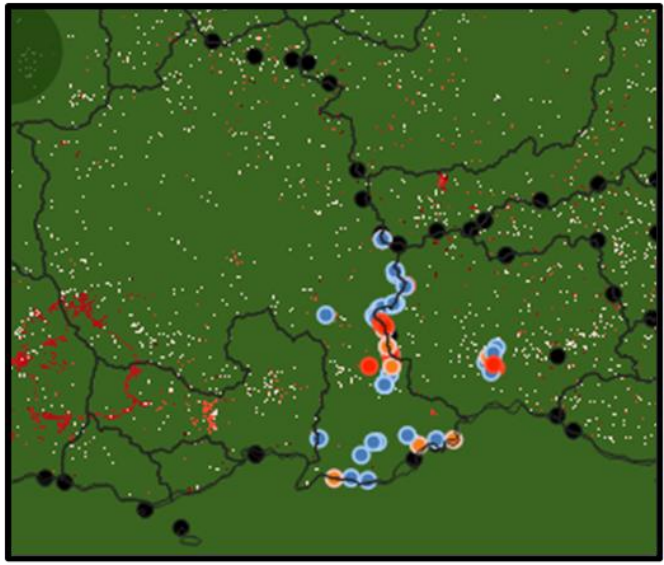
Community-based forest management: 6,345 ha protected since 2021





Better water quality (coliform contamination) in watersheds with less deforestation and less disturbance

WISH in Papua New Guinea (Manus Island)

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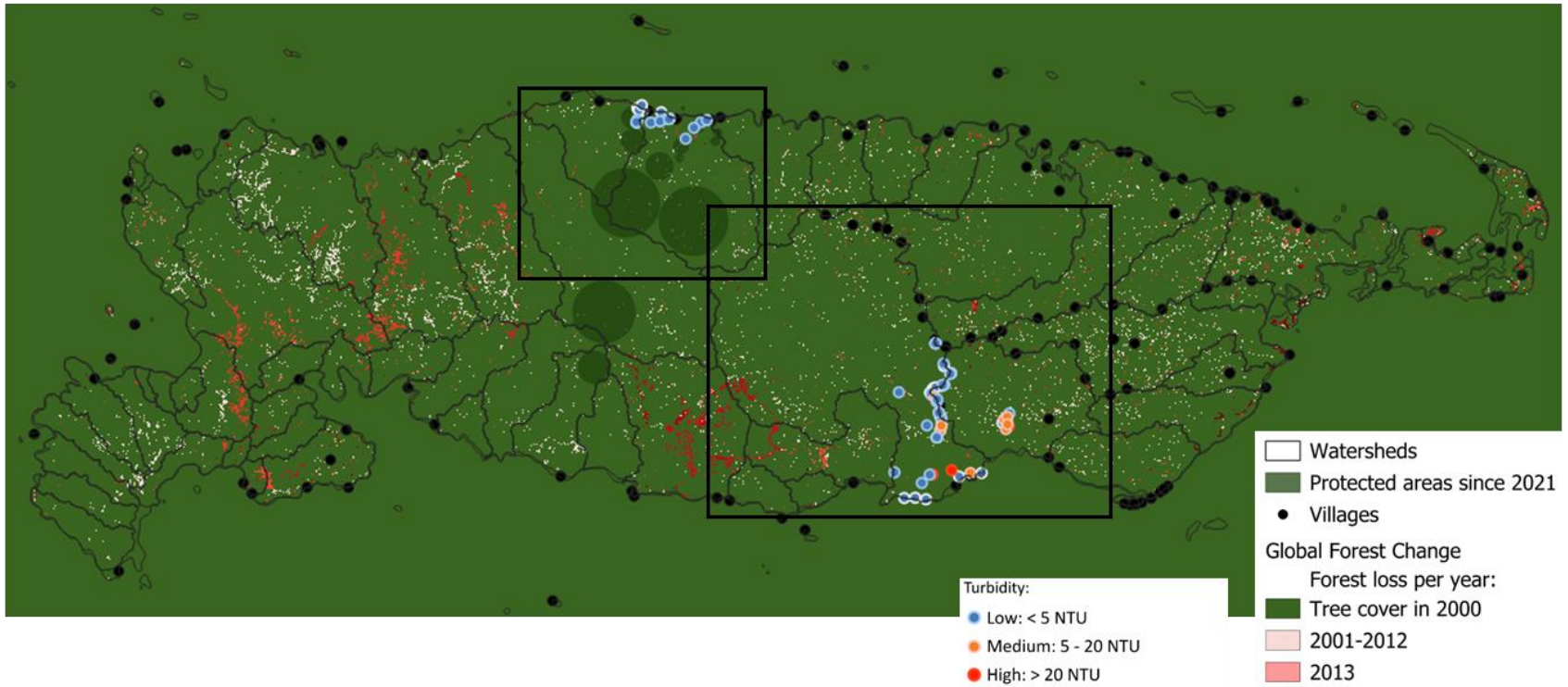
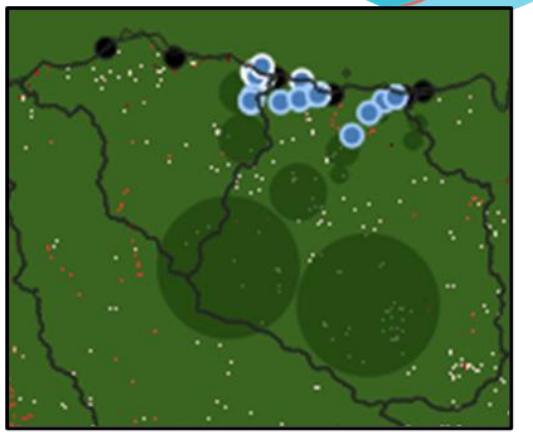
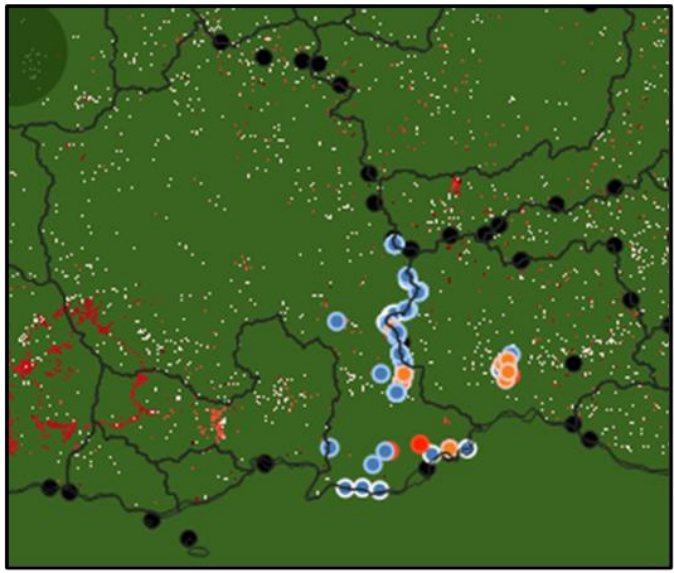
Community-based forest management: 6,345 ha protected since 2021







Better water quality (turbidity) in watersheds with less deforestation and less disturbance

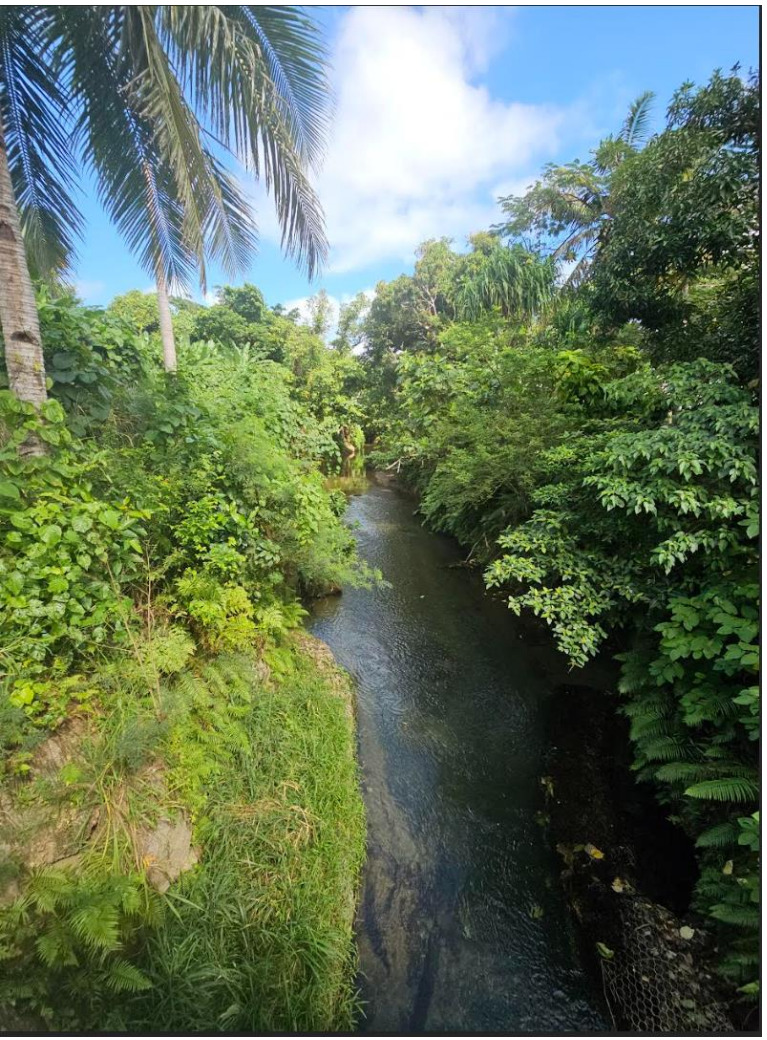
Challenges

- NbS take time to show full benefits. Communities may be more interested in infrastructure interventions showing quicker and more tangible benefits.

- Sectors relevant for holistic implementation of watershed management operate in silos.

- Watershed intervention implementation may stop when project funding is depleted. It's essential to scale up and develop blended financing mechanisms.

NbS in the Pacific



Practical NbS lessons from across the Pacific: Solomon Islands

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Lessons from the *Climate Inclusive WASH (WFW) informing the design of the* PacFresH2O – Protecting freshwater resources for increased climate resilience in the Solomon Islands

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ENVIRONMENTAL EDUCATION

WFW Project

- Target sites provides easier access, but also poses climate related risks such as landslides, coastal erosion, high water levels during storm surges, and flooding in and around river areas.

- The project has significantly improved the health, gender equality, and well-being of communities in the Solomon Islands

Lessons learn

-Findings highlight the importance of community engagement, realistic project design, and strong government partnerships. There is a continued need to address climate resilience, gender equality, social inclusion and stakeholder capacity (particularly government and community).

- **Strategic Planning and Governance**
- **Community Engagement and Capacity Building**
- **Infrastructure Design and Implementation**
- **Resource Management and Sustainability**
- **Monitoring and Quality Assurance**

Design considerations for the PacFresh H20

- Overarching goal of improving the overall well-being of rural communities by building climate resilience. This includes improving access to water and sanitation and protecting water resources, with additional emphasis on contributing to gender equity and improving livelihoods (**Impact**). The Project has 3 main outputs.

I - aim to improve multi-level coordination, decision-making and planning mechanisms.

II - focuses on the implementation of concrete adaptation measures, taking advantage of opportunities to increase climate resilience in two phases: (1) quick win actions, and (2) support for climate-resilient water resources management.

III aims to catalyze transformative effects beyond the local level to influence broader changes in national policies, regional cooperation, and access to finance

Design considerations for the PacFresh H20

- **Output II** :
- The two phased approach will allow the project to build early trust with the community through so called “quick wins” improving engagement and ownership with the communities while more sustainable long-term “climate resilient water management measures” can be developed and implemented.
- The implementation of more sustainable climate resilient water and sanitation measures will likely include identification and development of groundwater sources
- The development of these new water sources will be strategically integrated as a long-term solution to increase the communities' adaptability to changing climate conditions.

NbS consideration

- By taking advantage of these opportunities, the project will ensure that **water supply and sanitation systems are not only resilient to climate-related challenges**, but also **designed in harmony with local ecosystems**, whereby the groundwater abstraction will be considered to avoid impact to other ecosystems services such as existing springs and river baseflow.
- **Sustainable groundwater development** is an example of utilizing existing climate resilient natural water resources which are readily capable of meeting community needs, while building community awareness for protection of fresh groundwater resources, including the application of NbS such as identification and protection of groundwater recharge areas.
- Implementing the project in **collaboration with other partners and agencies** to improve NbS , SPC and Ecological Institute)

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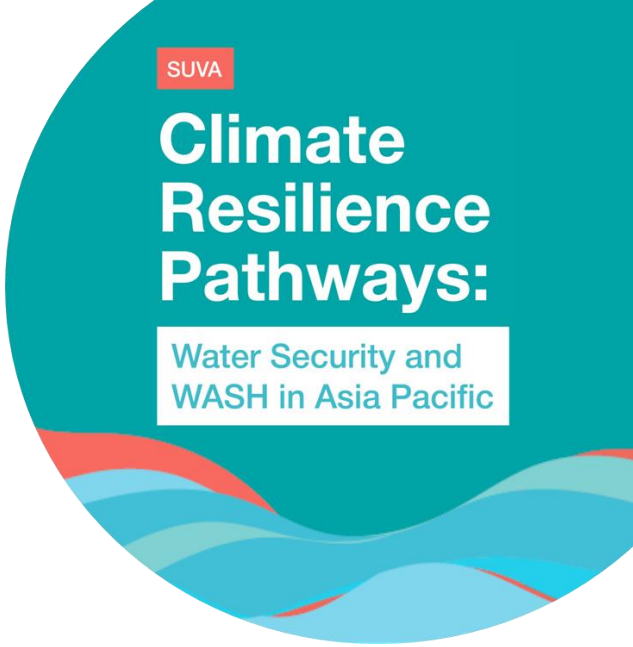
Vinaka vakalevu, tenkui tumas

Questions? Comments?



Group 1: How to scale up NbS

Facilitator: Rebecca Stirnemann (SPC, Kiwa)

- **Capacity and Technical Barriers??**
- Are there sufficient local technical expertise to design, implement, and maintain NbS?
- Is more training capacity development needed?
- Are we lacking technical knowledge or techniques?
- Do local institutions and governments have the technical and financial capacity to plan, implement, and maintain NbS?
- How to improve multi-sector and cross-level collaboration?
- **How to scale up NbS**
- “Think of an example in your country or region—what helped it scale, or what’s missing to go beyond the pilot stage?”
- “List 2–3 key actors that could strengthen NbS scaling—and what each needs to contribute or improve.”

Group 2: Monitoring of NbS

- locally feasible monitoring of biodiversity, cost of monitoring
- How to standardised monitoring – so we can collect similar data that can be compared, used, analysed over a long time period.
- different timescales of monitoring b/w sectors (i.e. WASH monitoring vs biodiversity monitoring)

Who is responsible for monitoring, and do they have the capacity and resources to do it effectively?

- Is monitoring community-led, government-driven, or a partnership?
- Are there sufficient tools, training, and funding to sustain monitoring over time?

- **How are monitoring results used to inform decisions and improve future NbS implementation?**

- Are data and lessons shared with stakeholders and used for adaptive management?
- Is there a feedback loop between monitoring results and project planning, policy, or scaling?

Group 3: GEDSI in NbS work

- what does this look like in practice?
- How to get government buy in on gender transformative approaches relating to NbS
- How to ensure women are benefitting (not just participating / using their time)

Feedback from group discussions

- Summary reporting from each group – 5 mins each

Conclusion and close