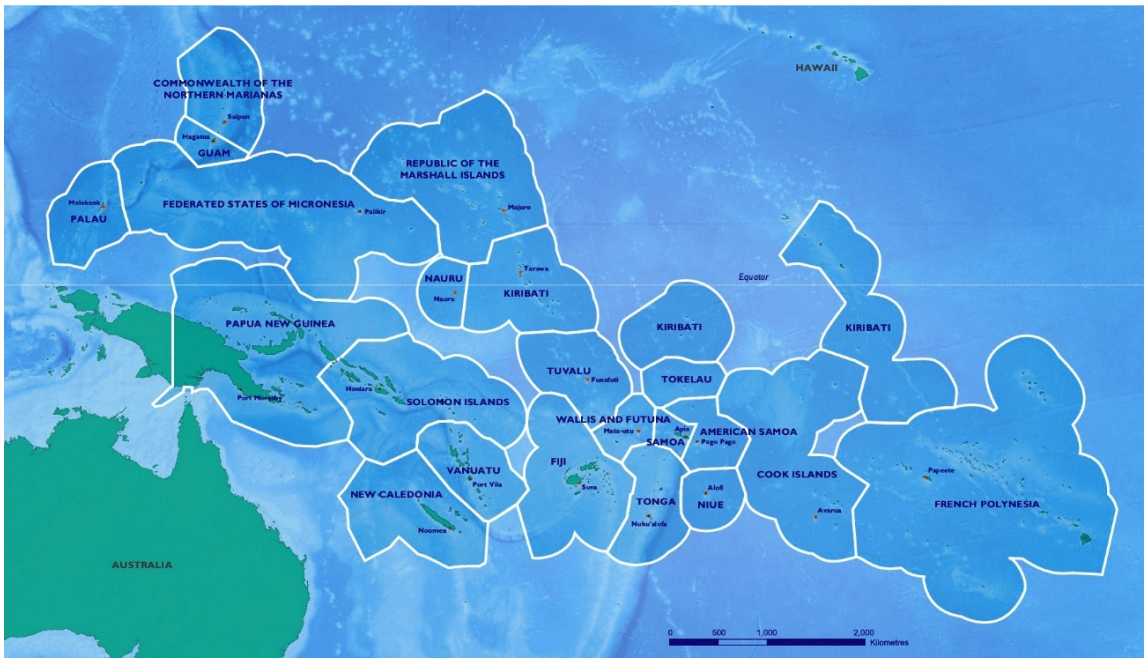
Priority Setting Workshop for Pacific Subregion, 23rd to 26th February 2021

Lima Adaptation Knowledge Initiative

Co-organized by:

United Nations Environment Programme, Secretariat of the Pacific Regional Environment Programme and United Nations Framework Convention on Climate Change



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1. Introduction

Adaptation to climate change has been identified as a top priority in regional climate change strategies and actions. However, adaptation knowledge gaps continue to be a barrier to widespread and successful adaptation actions. At the 20th Session of the Conference of the Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC) in Lima in December 2014, the COP Presidency endorsed and launched the Lima Adaptation Knowledge Initiative (LAKI) under the Nairobi work programme (NWP) on impacts, vulnerability and adaptation to climate change.

The LAKI addresses knowledge barriers that impede the implementation and scaling up of adaptation action. The first phase of LAKI focuses on understanding the critical knowledge gaps through a priority setting workshop that involves a participatory process of knowledge gap identification, categorization and prioritization for specific subregions. The second phase of the LAKI builds on the first phase by stimulating collaborative action to close knowledge gaps and helping stakeholders adapt more effectively to the adverse effects of climate change.

The LAKI is a joint action pledge under the NWP between the UNFCCC secretariat and UNEP through its Global Adaptation Network (GAN), a global knowledge sharing platform for climate adaptation composed of many regional networks and partners, each of which provide knowledge services in their respective regions.

Mandate: The LAKI has been firmly endorsed and mandated by Parties to the Convention. Mandates provided by Parties under the NWP over the years have acknowledged the efforts under the LAKI and encouraged the replication of this initiative in other subregions, particularly those including vulnerable developing countries such as Least Developed Countries (LDCs), Small Island Developing States (SIDS) and African States.

The three main goals of the LAKI initiative for the Pacific Sub-region in 2021 and beyond are:

- **Prioritize knowledge gaps for target knowledge users** in Pacific Sub-region. The Pacific sub-region consists of 14 SIDS, as well as Australia, New Zealand and 7 Pacific island territories, but in the context of this initiative the latter are not included. The Pacific sub-region for the LAKI consists of Cook Islands, Fiji, Kiribati, Marshall Islands, Micronesia, Nauru, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu. [1]
- **Close priority knowledge gaps** for the target knowledge users in Pacific Sub-region by convening adaptation experts and institutions to take actions and scale up adaptation action in the subregion
- **Gather evidence (**that capture **success**/progress**)** and **strengthen the alignment with the UNFCCC as well as other relevant processes/forums.**

Co-convenors and sub regional coordination entity

UNEP through the GAN and the UNFCCC secretariat are co-convenors of the LAKI. For the LAKI initiative in the Pacific Subregion, the collaboration is with Asia Pacific Adaptation Network (APAN), GAN's regional node in the Asia-Pacific, UNEP Regional Office for Asia and the Pacific and the

[1] The Pacific SIDS consist of 12 UN member countries, 2 non-UN member countries (Cook Islands & Niue) and 8 territories. The LAKI covers the first two categories.

Secretariat of the Pacific Regional Environment Program (SPREP) (a NWP partner)- a subregional coordination entity for the Pacific.

1.1. Objective of the priority-setting workshop

The priority-setting workshop for the Pacific subregion was organized from 23rd to 26th February.

The objectives of the workshop were to:

- Refine and prioritise the knowledge gaps for targeted knowledge users;
- Discuss a plan for closing the priority knowledge gaps and next steps.

1.2. Format of the workshop

This was the first LAKI workshop to be conducted in a virtual setting due to travel restrictions as a result of the COVID-19 pandemic. The workshop was convened via Zoom beginning at 12pm Apia time for the four days (23rd to 26th February, 2021), allocating approximately 2 hours a day.

2. Experts

Reference Group (RG)[2] : The RG are "core" experts in their fields in the subregion and have demonstrated relevant expertise and understanding of adaptation knowledge gaps that impede adaptation action in the Pacific. These experts were selected from regionals bodies, NGOs and private sectors. RG members participated in the LAKI workshop in their individual capacity as experts and were the best group to prioritize knowledge gaps in an objective manner.

The selection of the Reference Group members was coordinated by SPREP.

Functions

The RG members were responsible for providing inputs in identifying the adaptation knowledge gaps within the subregion, for contributing to the categorization and possible subsequent prioritization of the gaps and for contributing to the design and implementation of response actions. Based on their technical expertise, the RG were responsible for the following essential preparatory tasks prior to the workshop:

- Provide inputs to the pool of knowledge gaps, and review, comment, and substantiate gaps identified in the scoping paper;
- Provide inputs on the identified knowledge resources to match the identified knowledge gaps, as well as on the adaptation knowledge support programmes listed in the document;
- Familiarize themselves with key steps of the LAKI methodology.

During the workshop the RG:

- Discussed and complemented the list of gaps identified in the scoping paper so as to agree on the final pool of knowledge gaps to be considered for the sub-region;
- Conducted the categorization exercise using the agreed methodology;
- Conducted the prioritisation exercise using the agreed prioritisation methodology for the gaps;
- Provided pointers as to the best placed organisations to undertake response actions to close the prioritised knowledge gaps;
- Initiated discussion of response actions to close the knowledge gaps, including on the design of possible collaborative processes (such as innovative knowledge management strategies);
- Advised on the periodicity of the sub-regional workshop, so as to close newly identified knowledge-gaps at the sub-regional level.

After the workshop, RG members are expected to:

- Catalyse action pledges on response actions to close some of the identified knowledge gaps;
- Engage the organization they represent in undertaking response actions to close some of the identified gaps;

[2] The Reference Group is otherwise called as Multistakeholder Group (MSG) in the context of the LAKI. As MSG refers to the Melanesian Spearhead Group (MSG) secretariat in Pacific, the Reference Group is being used to avoid confusion.

- Engage in dialogues at the sub regional level to further discuss and finalize the collaborative actions; disseminate outcomes of the workshop, and/or progress and outcomes of the response actions.

Reference Group members:

- Wayne King - Office of the Prime Minister, Cook Islands
- Kathy Jetnil-Kijiner - Jo Jikum Office, Republic of the Marshall Islands
- Christopher Bartlett - Ministry of Climate Change, Vanuatu
- Malia Talakai - FAO Office, Samoa
- Taito Nakalevu - Independent expert**,** Fiji
- Linda Vaike - PACE-SD, University of the South Pacific, Fiji

Additional Experts working on adaptation projects in the Pacific subregion were also invited to the workshop. The role of these additional experts during the workshop were:

- contribute to the refinement and discussions of the knowledge gaps;
- engage in initial discussion on actions in closing the priority knowledge gaps.

Additional Experts:

- Hannah Barrowman and Katie Frisch - Australia Pacific Climate Partnership
- Professor Jon Barnett - University of Melbourne
- Salesa Nihmei, Filomena Nelson, Azarel Mariner-Maiai, Sione Fulivai, Ofa Kaisamy, Patrick Pringle, Monifa Fiu, Ella Strachan - Secretariat of the Pacific Regional Environment Program (SPREP).

3. Key Results

The adaptation knowledge gaps were categorized under the following areas or sectors of vulnerabilities: Agriculture and Fisheries, Human Health, Infrastructure and Human Settlement, Coastal Resources, Water Resources, Terrestrial Ecosystems, Energy and cross cutting issues: Social Protection and Gender, Information and Communications Technology (ICT) and Institutional Strengthening.

These key sectors were defined based on the mapping of national reports of countries in Pacific subregion to the UNFCCC process (National communications, NDCs and NAPs). Consideration was given to the adaptation knowledge gaps that were significant for the majority of countries in the sub-region.

Each knowledge gap was identified for targeted knowledge users and then grouped under the following four clusters:

[1] Lack of data (or limited data);
[2] Lack of access to existing knowledge;
[3] Lack of actionable knowledge (e.g., in need of repackaging existing knowledge);
[4] Lack of tools and methods to process knowledge into actionable form

The prioritization exercise during the workshop led to 65 priority knowledge gaps for Pacific subregion (see Annex 2).

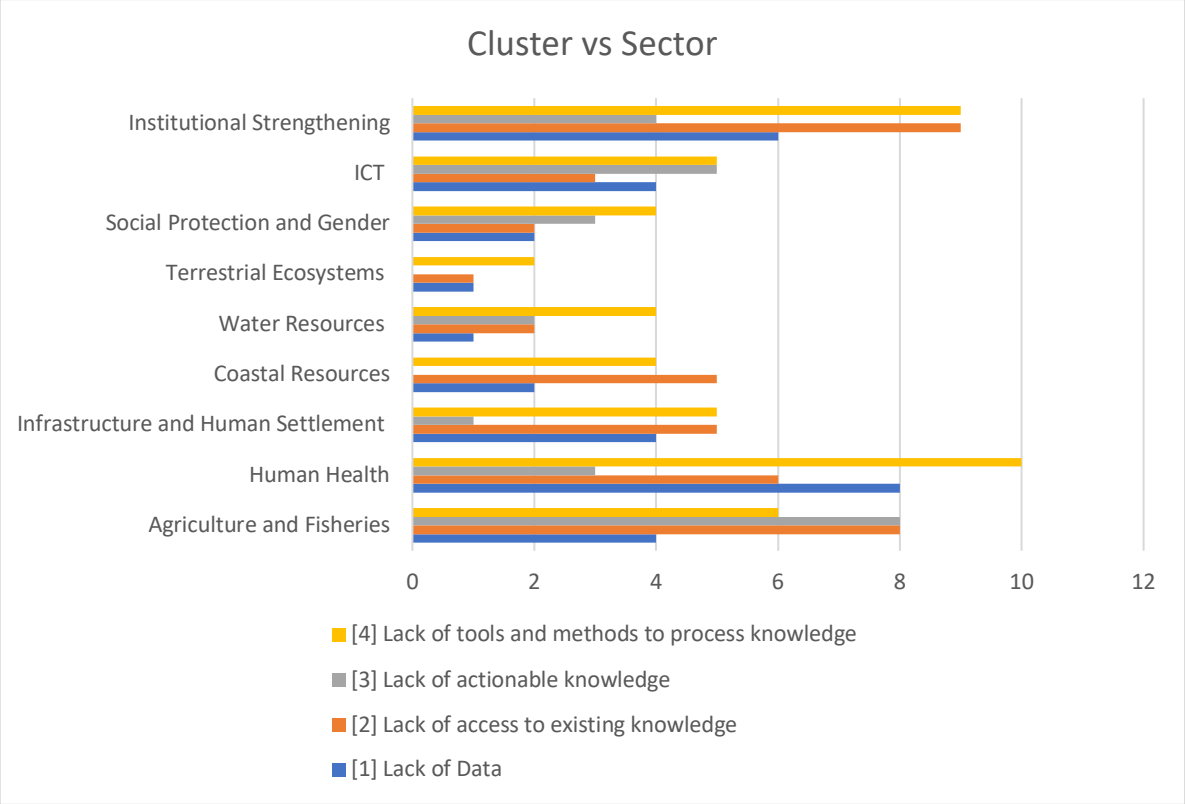


Figure 1:Chart showing clusters vs sectors

4. LAKI methodology

The LAKI methodology is used to identify and close adaptation knowledge gaps in the subregions. The methodology comprises of the following five steps:

Step 1: Scoping the knowledge gap

A scoping paper is prepared that identifies knowledge gaps for specific knowledge users for Pacific Sub-region based in technical inputs from Reference group of experts (February 2021).

The scoping paper includes an overview of the knowledge gaps (within the scope of the LAKI definition of the knowledge gaps) and targeted knowledge users. The scoping paper is informed by the mapping exercise based on review of reports submitted by countries to the UNFCCC process (e.g. NAPs, NDCs, national communications) and based on relevant literature.

Step 2: Convening a reference group

Reference group (RG): The members of the group are "core" experts for the prioritization exercise. They have demonstrated relevant expertise in understanding adaptation knowledge gaps that impede adaptation action in the subregion. The RG members can be associated with governments, regional bodies, research institutions, NGOs, private sector, regional platforms and have demonstrated relevant expertise based on the key themes/sectors for the sub-region.

The members of this group would be involved in adaptation projects and initiatives in the subregion and should involve policy-makers and practitioners with expertise in the needs and challenges arising from ground-level implementation.

RG members will participate in the LAKI workshop in their individual capacity as experts and are the best group to prioritise knowledge gaps in an objective manner.

Step 3: Refining knowledge gaps

Reference group is invited to provide inputs on the scoping paper. The group will specifically do the following:

- Provide inputs to the pool of knowledge gaps, and review, comment, and substantiate gaps identified in the scoping paper;
- Provide inputs on the identified knowledge resources to match the identified knowledge gaps, as well as on the adaptation knowledge support programmes listed in the document;
- Familiarize with key steps of the LAKI methodology.

Step 4: Prioritizing knowledge gaps and initial mapping of actions/initiatives/institutions in closing the knowledge gaps

The Pacific SIDS workshop was jointly organized by UNEP, SPREP and the UNFCCC secretariat to prioritize knowledge gaps for target knowledge users in Pacific Sub-region using the LAKI methodology, identify relevant institutions/partners as well as ongoing and upcoming initiatives that can address these knowledge gaps, develop monitoring and evaluation (M&E) to track and monitor the progress.

Step 5: Implementing actions to close the knowledge gaps and monitoring

Organize follow up meetings (could be in conjunction with relevant regional forums/events) to co-design actions and develop an implementation plan that involves the following: plan for designing and implementing actions with relevant institutions and experts in closing the priority knowledge gaps, resource mobilization and monitoring and evaluation (May-September2021).

Share the outcomes on the priority knowledge gaps and learning to-date with relevant regional and global fora and processes (e.g. APAN forum, events during SB52, COP26) (to continue in 2022).

Share the outcomes and learning with relevant constituted bodies under the UNFCCC process to strengthen alignment as well as support relevant mandates and work of the constituted bodies.

Figure 2: LAKI Methodology infographic

4.1. The priority setting workshop

The workshop (23-26 February 2021) was jointly organized by UNEP, SPREP and the UNFCCC secretariat to prioritize knowledge gaps for target knowledge users in Pacific Sub-region using the LAKI methodology, identify relevant institutions/partners as well as ongoing and upcoming initiatives that can address these knowledge gaps, and to develop M&E to track and monitor the progress.

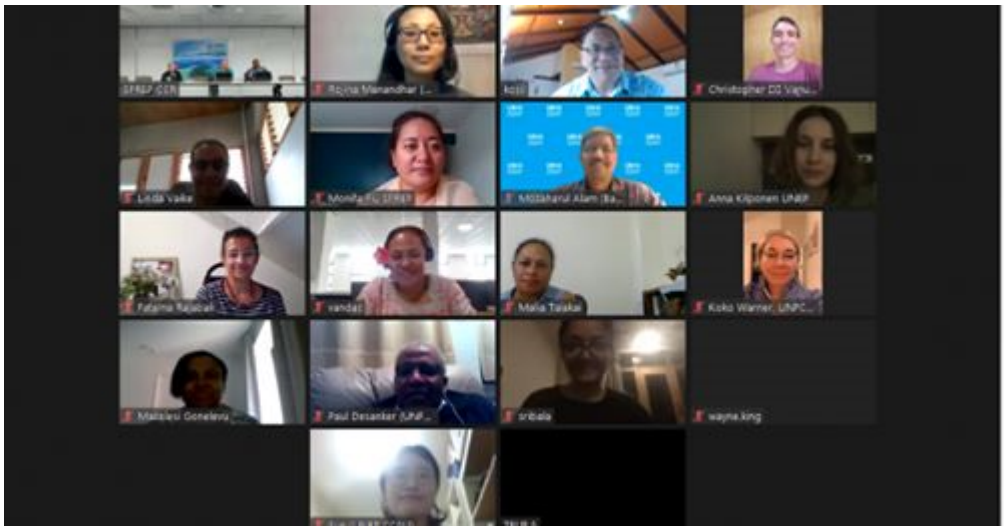


Figure 3: Photo of participants of virtual workshop

The following provides a step-wise overview in the context of the organization of the priority-setting workshop for Pacific SIDS:

Step 1: Scoping the knowledge gap

The scoping paper includes an overview of knowledge gaps (within the scope of the LAKI definition of the knowledge gaps) and targeted knowledge users. The scoping paper was informed by the mapping exercise based on review of reports submitted by countries to the UNFCCC process (e.g. NAPs, NDCs, national communications) and other relevant literature. The scoping paper contained 48 knowledge gaps identified from the NAPS, JNAPS, national communications, NDCs and other relevant sources.

The scoping paper was used as an entry point to inform the discussions in the priority-setting workshop.

Step 2: Convening a reference group (RG)

Nine experts were invited by SPREP to be part of the Reference Group and to participate in the LAKI priority-setting virtual workshop from 23rd – 26th February 2021.

Scoping paper and concept note of the LAKI Pacific SIDS (including an overview of prioritization methodology) were shared in advance with the RG members.

The workshop kickstarted with opening remarks by Mr Youssef Nassef, Director, Adaptation Division of the UNFCCC, Mr Kosi Latu Director General of SPREP and Mr Sefanaia Nawadra, Head, UNEP Pacific Office.

Opening remarks by Mr Kosi Latu, Director General, SPREP

Mr Latu informed that meeting that SPREP was the lead agency in the region for climate and environmental challenges and that the primary goal of SPREP was to build lasting durable partnerships

regarding climate change issues. Under the LAKI there was opportunity for knowledgeable experts in climate change adaptation to meet and review the knowledge gaps, identify actions needed to address those gaps and make well informed recommendations on a way forward.

SPREP is currently trialing a methodology to assess the impacts of the effectiveness of adaptation actions in the region under Global Climate Change Alliance Scaling Up Pacific Adaptation project. While there is difficulty in objectively and quantitatively assessing these actions, the results will benefit from understanding where the adaptation knowledge gaps are in the region. Furthermore, one of the priority actions of the Pacific Climate Change Centre is to enhance knowledge brokerage in the region within the LAKI work.

Mr Latu stressed the need to overcome institutional barriers and bridge the gap between the knowledge producers and the knowledge users. This would involve the consolidation, translation and communication of knowledge in a form that is usable and accessible to users such as decision makers and policy makers.

The LAKI will contribute to ongoing processes and initiatives and determine SPREP's engagement with development partners particularly in increasing their investment in closing the gaps with the overall objective to increase resilience.

Opening remarks by Mr Youssef Nassef, Director Adaptation Division UNFCCC

Mr Nassef acknowledged the partnership between UNFCCC, UNEP and SPREP. He informed the meeting that the LAKI sets out to remove knowledge barriers through a high impact activity with significantly low cost but stressing that the knowledge gaps needed to be identified before embarking on closing them.

The LAKI has established itself as a very rigorous methodology that allows for first a comprehensive literature review leading to consideration by experts assembled in workshop to further elaborate on the knowledge gaps and identify the criteria for prioritization, identify weights for these criteria and going through 2 rounds of prioritization which renders the process rigorous and the outcomes legitimate. The next step is engaging all institutions in the region to fill the gaps.

He mentioned that UNFCCC had a successful engagement for 2 subregions North Africa and West Asia where the Economic and Social Commission for West Asia had taken a leadership role to implement actions to fill the knowledge gaps. UNFCCC and UNEP will ensure this happens for the Pacific region after the Pacific workshop has concluded and there is a final list of priorities.

The evaluation of activities or indicators of success was to be measured by redoing the prioritization exercise in a few years (LAKI is iterative) and being able to demonstrate that the gaps have been filled.

The partnerships amongst experts and agencies will create a new ecosystem, a community of intellects, a community of practice that will work together to share knowledge and progress the discourse in adaptation knowledge and its implication on upscaling adaptation actions.

LAKI is an action pledge in NWP and the Subsidiary Body for Scientific and Technological Advise has mandated LAKI to upscale LAKI for all SIDS and LDCs and Africa and report back to Glasgow where there is opportunity to upscale further.

Opening remarks by Mr Sefanaia Nawadra, Head, UNEP Pacific Office

Mr Nawadra informed the meeting that the LAKI is a joint action pledge between UNFCCC secretariat and UNEP through the Global Adaptation Network (GAN). The LAKI process works to identify gaps at the sub regional level and is an important bridging mechanism between the national and UN regional work.

He stated that UNEP's midterm strategy 2022-2025 strengthens the mandate to implement climate action through 2 key modalities of programming and partnerships. In November 2020, the Green Climate Fund board approved UNEP's $50 million programme to support climate resilience through improving early warning systems in 5 Pacific island countries, executing the programme with 13 regional partners including SPREP and SPC as key partners.

For climate adaptation, UNEP has 70 projects in 50 countries with a total value of $365 million. However, in the Pacific UNEP has not had a significant presence in adaptation and this is the gap UNEP would like to address. UNEP has 50 Ecosystem-based Adaptation projects and would like to see the UNFCCC Least Developed Country fund used for adaptation in the 4 Pacific Least Developed Countries.

UNEP hosts the GAN, a global knowledge sharing platform for adaptation with 5 regional nodes, - APAN being one. From March 8-12, the Ministry of Environment in Japan hosted the 7th APAN forum and the outcomes from LAKI workshop were presented at the APAN Forum workshop session to show gaps and priorities in Pacific and partnerships in place.

The LAKI workshop uses a globally accepted and proven methodology to carry out the gap assessment and action prioritization. The outcomes will enable organizations to advocate subregional priorities at regional and global forums. The outcomes can be utilised for strategic planning processes that can be done individually as an organization or collectively with partnerships such as GAN etc.

It will further help develop strong climate rationale that are essential to accessing climate finance that will enable the Pacific to present a stronger case when trying to access financing.

Finally he concluded that the LAKI is an iterative process and the outcomes will be part of the living document, baseline setting exercise, to revisit in the near future to ascertain what has been achieved and what is yet to be done.

Step 3: Refining and categorizing knowledge gaps

On the first day of the priority-setting workshop, the key findings of the scoping paper were presented. Reference group members and experts then provided inputs to refine the knowledge gaps in a plenary setting. The group specifically did the following:

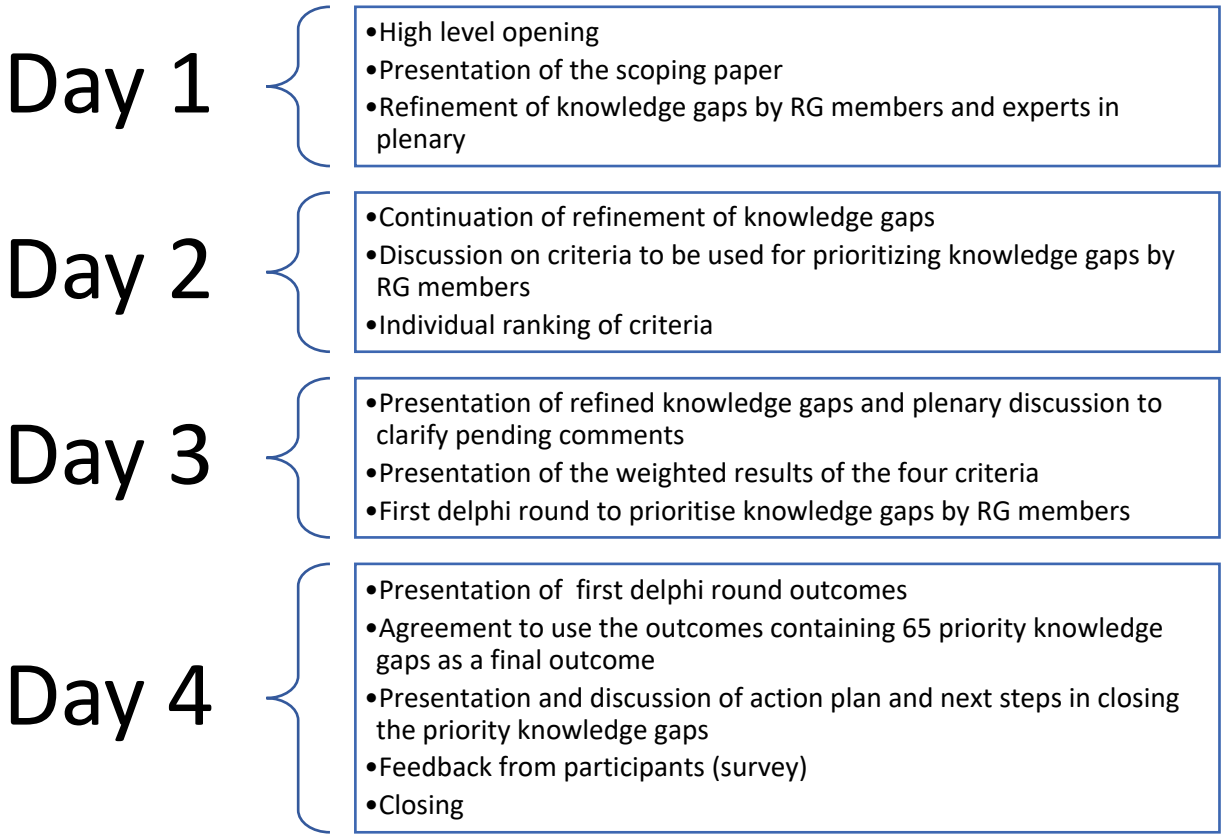
- Provided inputs and feedback to the pool of knowledge gaps, and reviewed, commented, and substantiated gaps identified in the scoping paper;
- Provided additional knowledge gaps.

The refinement of the knowledge gaps continued in a second day resulting in 65 refined knowledge gaps.

Step 4: Prioritizing knowledge gaps and designing response actions

On day 2, as a part of the prioritization exercise, RG members defined criteria and assigned weights to these criteria. RG members convened in day 3 to conduct the first Delphi round of the prioritization

exercise. On day 4, results of the first Delphi round were presented. RG members discussed and agreed to use the outcomes of the first Delphi round to inform the next steps. In addition, day 4 also involved presentation and reflections on overview of actions and next steps in closing the priority knowledge gaps, including various roles and responsibilities. Participants also provided feedback on the overall workshop.



Please see next section for discussions and results.

5. Results

Refinement of Knowledge Gaps

Reference group members and experts refined the knowledge gaps in plenary session. They reviewed, commented, and substantiated gaps identified in the scoping paper as well as provided additional knowledge gaps.

Below are key discussions during the refinement exercise:

Agriculture, Fisheries, Livestock & Forestry

All knowledge gaps were considered relevant. Three new knowledge gaps relating to livestock management, soil management and land use management were added.

Human Health

Experts noted that there is a need to link health and climate change data, managing vector bourne diseases post disaster taking into consideration lack of knowledge of customary practices of disease management, the state of mental health or psychosocial health post disaster/climate risks and observations of climate risks and 'modelling of changes in the risk of transmission of mosquito-borne diseases'. Five new knowledge gaps were added. These knowledge gaps related to the correlation between climate change and mental/psychosocial health, impact of climate change on non-communicable diseases, knowledge on customary and modern strategies, tools and methods for monitoring and managing disease vectors such as mosquitos, impacts of climate change on health related illness, morbidity, mortality, and productivity and information to understand the impacts of climate change on food security and health.

Infrastructure and Human Settlement

Migration and Displacement – Experts highlighted that more knowledge is essential in contextualizing issues around maintaining dignity, ownership over displacement process. However, there are lack of policies in terms of planning, and the policies need to be focused because this is not a major issue in some countries. Some resources to consider are best practices and tools, case studies, research on displacement funded by EU office in Suva and Displacement Guidelines developed by Fiji Government.

It was noted that consideration needs to be given to the types of migration - planned migration and ad hoc in response to disaster. Pacific Regional Consultation on Internal Displacement, organized by the Pacific Resilience Partnership's Technical Working Group on Human Mobility and the UN Secretary-General's High-Level Panel on Internal Displacement could provide a useful reference.

Building Codes – Experts noted that there is existing capacity to review building codes. However, better building codes require more financial resources and there is a lack of capability including accessing finance to implement building code. The issue of infrastructure needs to be included in land use planning.

Two new knowledge gaps were added under Infrastructure and Human Settlement relating to migration and displacement and mainstreaming infrastructure into planning.

Coastal and Marine Ecosystems

Nature Based Solutions – Knowledge gaps such as lack of understanding of the differences in terminology and principles of nature-based solutions and ecosystem based adaptation and lack of knowledge on the use of nature-based solutions to assist in the protection of reef-facing coastlines

were discussed. One new knowledge gap relating to lack of knowledge on ocean acidification adaptation solutions was added.

Terrestrial Ecosystems

Erosion hotspots – Lack of understanding of the drivers for erosions was noted as a knowledge gap. This is related to soil types and agricultural practices. More research, including high resolution spatial data such as Lidar data is needed on the erosivity of soils. One new knowledge gap relating to erosion hotspots was added.

Social protection and gender

Lack of knowledge on environmental and social safeguards was identified as a gap. Experts noted that initiatives need to be more gender sensitive and women need to be recognized as `agents of change`. Five new knowledge gaps were added. These relate to lack of knowledge of environment and social safeguards (ESS), lack of knowledge to design and implement social protection initiatives, lack of data on gender and the need to include women, girls and people with disabilities in planning and policy development.

Information, Communication and Technology

Two new gaps were added relating to the lack of the use of applications (that run on mobile devices) and social media as a medium to communicating climate change information and the need for an adaptation practices database.

A number of knowledge gaps that were not fully contextualized during the workshop are provided in ***Annex 5*** for future consideration.

Criteria setting and weighting

The Reference Group were tasked with defining the criteria for the prioritization of adaptation knowledge gaps and assigning weights to the criteria.

The Reference Group agreed on the following criteria:

- **Urgency** (Closing the gap will generate immediate benefits or addresses urgent adaptation needs)
- **Sustainability** (Filling the knowledge gap will help sustain benefits over the long term)
- **Contribution to building the resilience of community** (Filling the knowledge gap will increase the resilience of the community against climate change)
- **Multiple co-benefits** (Filling the knowledge gap will bring co-benefit to other sectors as well as mitigation efforts)

The Reference Group ranked the criteria (individual exercise). The objective of the scoring is to produce distinct weights for each of the criteria to be applied during the prioritisation of gaps. The infographic below shows the relative weights assigned to these criteria. Urgency ranked highest at 32%, followed by Contribution to Resilience Building 26%, Sustainability 24% and Multiple co-benefits at 18%.

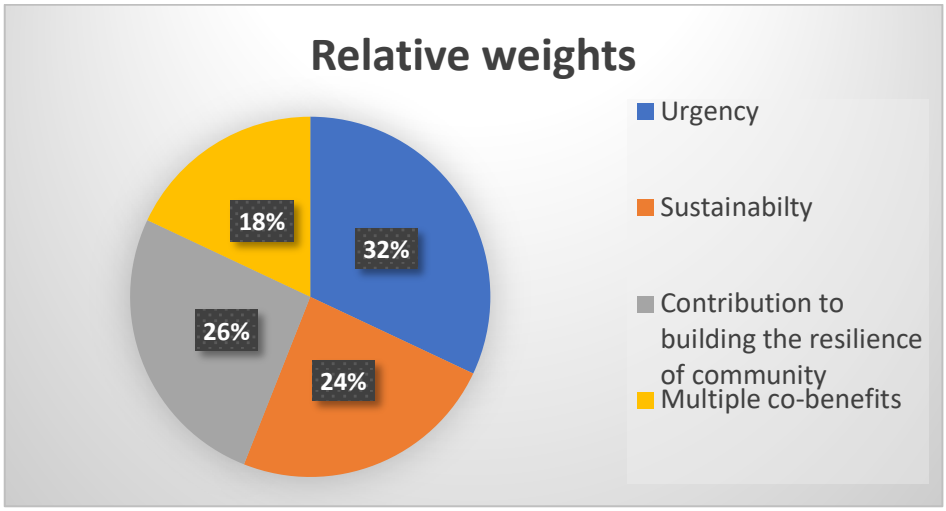


Figure 4: Outcomes of the weighted criteria: based on ranking by the Reference Group

Prioritization of Knowledge Gaps

5.1. Results of Delphi Round 1

Ranking of Priority Knowledge Gaps

The results of the prioritization exercise for Delphi Round 1 showed that knowledge gaps under the theme Social Protection and Gender ranked highest followed by Infrastructure and Human Settlements and Human Health. See table below that provides an overview of the top 20 knowledge gaps. The full list of all 65 priority knowledge gaps is available in Annex 2.

Ranking	Theme	Description of knowledge gap	Targeted knowledge users
1	**Social Protection and Gender (marginalized/vulnerable groups)**	Lack of knowledge to include women, girls, people with disabilities in designing and implementing adaptation plans and policies	Project designers and implementers, policy makers, decision makers, communities, NGOs, CSOs
2	**Infrastructural and Human Settlements**	Lack of capacity to support climate proofing infrastructure	Civil engineers, town and country planners, construction companies, building material suppliers, private sector, local communities
3	**Institutional Strengthening**	Lack of knowledge to access climate change adaptation funds	Climate change officers, finance officers, relevant sector officers, NGOs, CSOs, faith based organisations, local communities
4	**Human Health**	Inadequate Early Warning System for health	Environmental health officers, epidemiologist, health inspectors, water officers, local communities, schools, NGOs, CSOs, faith based organisations
5	**Social Protection and Gender (marginalized/vulnerable groups)**	Lack of data on Gender	Project designers and implementers, policy makers, decision makers

6	Human Health	Lack of information to understand the impacts of climate change on food security and health (i.e. nexus of Climate change, food security and health)	Health professionals, Food nutritionists, food security officials, communities
7	Infrastructural and Human Settlements	Lack of knowledge of climate change impacts on human settlements	Civil engineers, town and country planners, construction companies, building material suppliers, private sector, local communities
8	Social Protection and Gender (marginalized/vulnerable groups)	Lack of access to Early Warning System by youth and remote communities	Social workers, local government, town and country planning, natural disaster management officers, NGOs, CSOs, faith based organisations, youth groups, remote communities
9	Water Resources	Lack of tools and methods to assess climate change impacts on water resources for water conservation and management (link to fisheries, agriculture and health)	Water experts, town and country planners
10	Institutional Strengthening	Lack of tools to integrate traditional knowledge for adaptation and disaster risk reduction	Climate change officers, environment officers, local communities, NGOs, CSOs
11	Human Health	Lack of information and tools to assess impact of climate change on mental/psychosocial health, particularly mental/psychosocial health from a Pacific perspective.	Health professionals, Psychologists, social health staff, counsellors, health inspectors, post disaster assessment officers
12	Institutional Strengthening	Lack of data to assess impacts of climate change and to develop cost-effective solutions	Climate change officers, bank officers, insurance officers, town and country planners, finance officers
13	Water Resources	Lack of knowledge and tools for monitoring water sources	Water experts, agriculture officers, health officers, town and country planners
14	Information & Communications Technology	Lack of access to meteorological data in climate change decision making	All relevant sectors
15	Information & Communications Technology	Lack of access to climate risks information to inform policy and planning	Policy developers, town and country planning, environment officers, fisheries officers, agriculture officers
16	Coastal and Marine Ecosystems	Lack of knowledge to monitor coastal and marine ecosystems	Fisheries officers, environment officers, NGOs, CSOs, faith based organisations, local communities
17	Water Resources	Lack of methods and tools for analyzing water quality and quantity due to impacts of climate change	Water experts, agriculture officers, health officers, country and town planners
18	Institutional Strengthening	Lack of knowledge to conduct Technology Needs Assessment	Climate change officers, energy officers, fisheries officers, agriculture officers, water experts
19	Institutional Strengthening	Lack of knowledge to assess climate change vulnerability and adaptation (V &A)	Climate change officers, environment officers

20	**Human Health**	Lack of data on health system to monitor impacts of climate change against climate sensitive diseases	Environmental health officers, epidemiologist, health inspectors, water officers

The outcomes of the rankings from the Delphi 1 and their priority order revealed knowledge gaps that some Reference Group members felt should have been included (with higher priority), with some suggesting the gaps to be grouped under a thematic outcome, i.e. gaps to be ranked within each thematic area. However, selecting 2 or 3 priority knowledge gaps from each thematic group for second Delphi round would have defeated the purpose of the methodology and as the reference group members were also concerned that second Delphi round would take some of the pertinent knowledge gaps off the priority list, a suggestion was made to include all knowledge gap rankings as an Outcome table, and not proceed to a second Delphi Round of Scoring noting that all the 65 knowledge gaps were pertinent for Pacific SIDS. The entire table with 65 priority knowledge gaps (ranked in order of priority) as an outcome would then be used to facilitate conversation with most relevant organizations and agencies and to convene partnerships to close these knowledge gaps.

6. Discussion on action and next steps to close the priority knowledge gaps

The final segment of the workshop involved presentation and discussion of next steps in closing the knowledge gaps for the Pacific subregion.

Developing collaborative action plan and convening partnerships in closing the priority knowledge gaps:

SPREP, in its role as a subregional partner for Pacific SIDS will take a lead role with inputs from UNEP and UNFCCC in this regard. Following actions will be considered:

- **Mapping of relevant actors and actions in closing knowledge gaps**
  - A strategy outlining mapping of relevant institutions in Pacific SIDS against the priority knowledge gaps and engagement plan;
  - SPREP to convene an internal workshop to discuss the outcomes of the priority-setting workshop to determine what initiatives are currently in place, what's in the pipeline/timeline and what activities can be undertaken by SPREP in closing the priority knowledge gaps;
  - SPREP to seek further inputs from RG members and additional experts on relevant national and regional agencies who might be best suited to close some of these knowledge gaps;
  - Bilateral consultations with relevant partners who would have been mapped out to explore their interest and discuss actions to close the priority knowledge gaps (as well as identify resource needs in implementing these actions);
  - Consultations and mapping exercise will help identify relevant institutions, agencies and relevant actions, required resources to take actions, that are underway and potentially could be scaled up in addressing some of these knowledge gaps.

- **Collaborative actions in closing the knowledge gaps:**
  - Co-designing actions in closing the knowledge gaps with partners (this could entail an organization of meeting with all interested partners and to explore possibility of organizing such meeting at the margin of relevant regional meetings/fora in Pacific SIDS);

- SPREP to seek the further comments from RG offline including information on which national or regional agencies might be suited to work in closing some of the knowledge gaps;
- SPREP to gauge what other agencies are doing in relation to the knowledge gaps and the seek their involvement in closing the knowledge gaps;
- UNEP to consider incorporating knowledge gaps into work areas and in the recently approved Mid-term strategy 2022-2025 for resource mobilization in closing gaps;
- Reference Group members also propose to incorporate the priority knowledge gaps in future planning and resources mobilization process within their respective institutions.
- Developing a monitoring and evaluation framework to track progress of the LAKI.

Sharing and advocacy

- Co-conveners UNEP (through the GAN) and UNFCCC in partnership with SPREP shared the outcomes of the workshop at a joint session on nature based resilience (science and assessment aspects) at the APAN Forum 8-12 March 2021. The session "Closing adaptation knowledge gaps to scale-up nature-based action in Asia-Pacific" took place on March 10, 2021. During this session, representatives from SPREP and the Reference Group reflected on the importance of stakeholder engagement, integration of traditional knowledge and the role of nature-based solutions in further scaling up adaptation action and closing adaptation knowledge gaps in the Pacific region. The session video recording is available at the APAN Forum YouTube channel (via this link), and the key messages of the session are captured in Figure 6.
- The outcomes of the workshop are to be shared with a wider UNFCCC/NWP, SPREP and GAN audience in the form of blog posts and articles, such as "What are the critical knowledge gaps in the Pacific?" and "Identifying and addressing knowledge gaps in adaptation in the Pacific Region ", and through NWP eUpdates, UNEP platforms, GAN newsletter, and GAN and APAN mailing lists.
- Findings of the workshop and progress in closing the knowledge gaps will be integrated in an official report of the Nairobi Work Programme which will be considered by Parties at SBSTA 52 under the UNFCCC process;
- UNEP, UNFCCC and SPREP to explore various platforms to share the outcomes and learning, including at COP26 and other adaptation events.

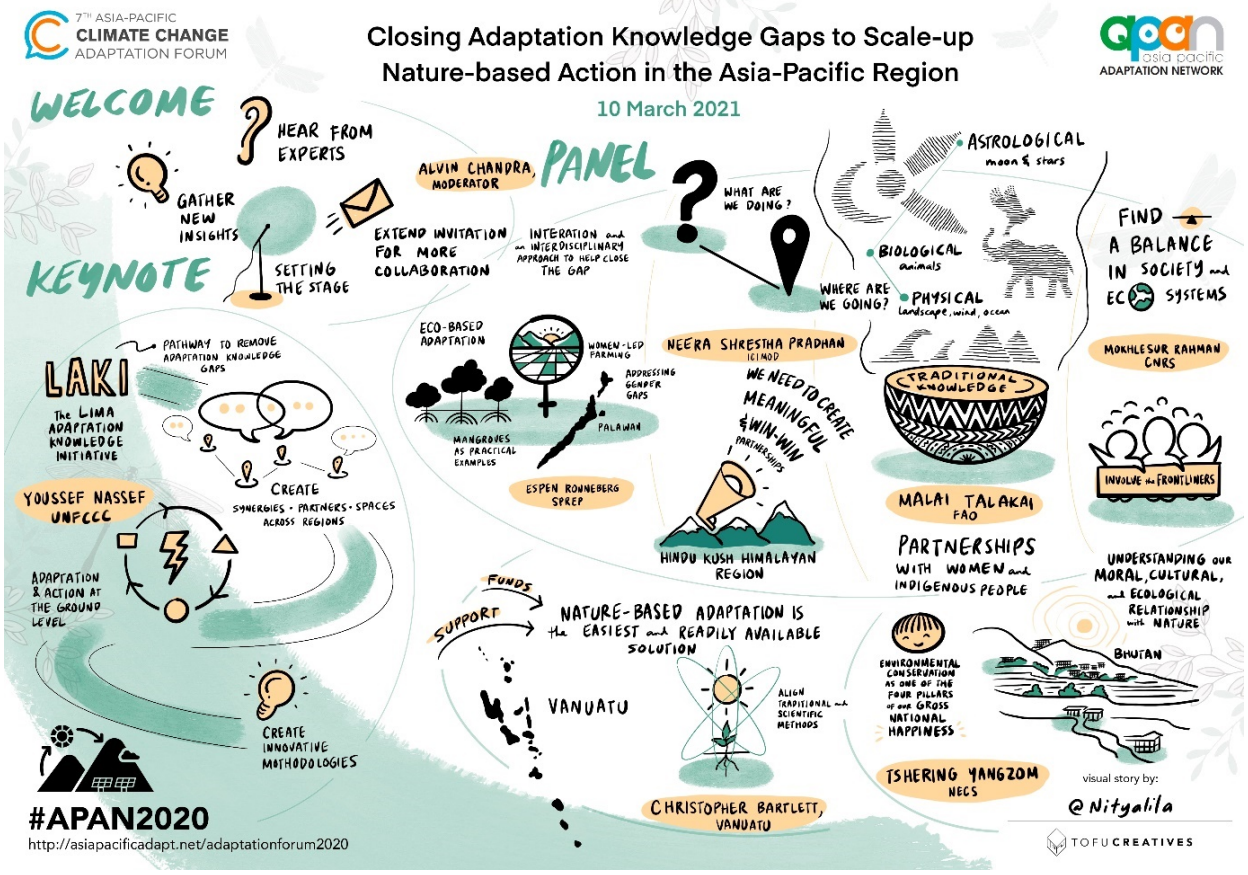


Figure 5: Key messages of the "Closing adaptation knowledge gaps to scale-up nature-based action in Asia-Pacific" session at the APAN Forum.

Role of Reference Group and experts:

The RG members noted the outcome and committed to the following:

- At a national level, the RG members expressed interest to use the outcomes by mainstreaming the knowledge gaps identified during the LAKI workshop into project planning and policy making for better coordination, implementation, planning and resource mobilization in order to address the knowledge gaps. Resources, not only referring to financing but also tapping into the technical expertise that exist within the reference group or wider group of experts and regional organisations to provide the technical know-how to countries for closing these gaps;
- The RG members expressed interest to further engage with SPREP in close these knowledge gaps;
- At a regional level relating to agriculture, Food and Agriculture Organisation sub regional office will use the outcomes to gauge current activities in the Agriculture sector and linking to other cross cutting sectors such as water, health and gender in order to address these knowledge gaps and strengthen efforts in areas where needed;
- At a regional level relating to climate change research work, RG members will share the outcomes internally within University of the South Pacific in order to explore ways in which climate change research at USP can help in addressing the knowledge gaps, and to engage students and researchers at USP at the institution to help carrying out the relevant research work;

- The RG members stressed the importance of knowledge brokering and ensuring that knowledge is accessible in usable form for the targeted user. There was a reflection that the RG should convene in the near future to revisit the success of the actions in closing the knowledge gaps.

7. Key takeaways and feedback on the workshop:

RG Members and experts were very engaged and provided pertinent contributions to various parts of the exercise, as they are the experts in the field who have the rich experiences, knowledge and insights in adaptation gaps and solutions in the region.

These experts would have a pertinent role in closing the knowledge gaps. Here is an overview of reflections shared by experts:

- The workshop was very useful in identifying areas/sector in adaptation that were not highlighted before and new knowledge gaps that had not been considered and articulated previously. All gaps are crucial and should be addressed at an agency, national and regional levels;
- As outlined above, SPREP will be convening consultations with the RG members and experts to build the momentum and engage them in terms of designing the actions in closing the identified knowledge gaps;
- The workshop organisers have gathered several lessons given that this is the first LAKI priority-setting workshop to have convened in a virtual format. Virtual engagement entails more pre-engagement with experts as well as more workshop time to allow for conducive and insightful conversation. The organisers also learned that in a virtual setting, it is difficult to ascertain full time commitment of experts noting that experts also have other work-related commitments. While the organisers had prepared and shared detailed guidance and information prior to the workshop including the logistics of the workshop, given the objectives and modus operandi of the workshop, physical meeting would facilitate more robust conversations and allow participants to have more time to professionally make connections, which would be substantial for the potential adaptation initiatives that may involve collaboration between those entities to be implemented successfully;
- The workshop has produced a comprehensive synthesis of the pool of knowledge at the level of the Pacific SIDs subregion and those share ecological and other characteristics. The outcomes also highlight discussions and knowledge gaps in nature based solutions:
    - Out of the 65 knowledge gaps 23 were related to nature based solutions. Below are the sectors and corresponding ranked knowledge gaps from Annex 2:
        - Coastal Ecosystems - 16, 40, 49, 51, 54, 59 and 64;
        - Agriculture, fisheries, livestock and forestry - 24, 32, 41, 43, 44, 50, 60, 65;
        - Infrastructure and human settlements - 7, 22, 48;
        - Water resources - 9, 13, 17;
        - Terrestrial ecosystems - 42, 47.
    - The experts discussed **nature based solutions** in particular knowledge gaps such as lack of understanding of the differences in terminology and principles of nature-based solutions and ecosystem based adaptation and lack of knowledge on the use of nature-based solutions to assist in the protection of reef-facing coastlines were discussed.
    - There were knowledge gaps related to nature based solutions that needed further research into the context see Annex 4. These were:
        - Lack of knowledge on oceans;

- Lack of knowledge about the responses of reef-facing shorelines to climate change;
- Lack of knowledge about the scope from nature based solutions to assist in the protection of reef-facing coastlines;
- Lack of effective dissemination of research outputs and data on coral reef monitoring in accessible formats;
- Limited data on impact of sediment deposition on coral reefs. Linked to watershed management.

- The outcomes are useful for providing robust grounds for developing concrete proposals and request for funding. Given the recent experience with Vanuatu raised, the need to close the knowledge gaps in order to successfully go through rigorous screening and vetting requirements of the funding opportunities;
- The workshop has helped prioritise adaptation knowledge gaps that are needed to address adaptation needs in the subregion. This workshop in a sub-regional setting added value. From the perspective of Pacific SIDs, this will contribute to building resilience for vulnerable communities;
- The actions to close these priority knowledge gaps will be critical to be advanced soon through engagement with relevant institutions. The workshop could be reconvened in few years' time to monitor the progress being made in closing the knowledge gaps.

Annex

Annex 1: Organising Team

Name	Affiliation
Anna Kilponen	UNEP (Global Adaptation Network)
Lis Mullin Bernhardt	UNEP (Global Adaptation Network)
Espen Ronneberg	SPREP
Fatema Rajabali	UNFCCC
Koko Warner	UNFCCC
Mozaharul Alam	UNEP (Asia-Pacific Adaptation Network)
Rojina Manandhar	UNFCCC
Sefanaia Nawadra	UNEP, Pacific Office
Sophie Boehm	UNFCCC
Sribala Sah	UNFCCC
Suyeon Yang	UNEP (Global Adaptation Network)
Teuila Fruean	SPREP
Makelesi Gonelevu	Consultant

Annex 2: Priority knowledge gaps for Pacific SIDS (Final outcome)

Ranking	Thematic area	Title	Description (including the reasons why it is considered a gap)	Cluster	Target Knowledge User
1	Social Protection and Gender (marginalized/vulnerable groups)	Lack of knowledge to include women, girls, people with disabilities in designing and implementing adaptation plans and policies	Lack of knowledge – as agents of change and contribution to adaptation	[2] Lack of access to existing knowledge; [3] Lack of actionable knowledge (e.g., in need of repackaging existing knowledge)	Project designers and implementers, policy makers, decision makers, communities, NGOs, CSOs
2	Infrastructure and human settlements	Lack of capacity to support climate proofing infrastructure	Lack of capacity to develop/review building codes, zoning and minimum standards for the construction and management to be considered in designing and developing infrastructure. Lack of capability to implement building codes once reviewed.	[2] Lack of access to existing knowledge; [4] Lack of tools and methods to process knowledge into actionable form;	Civil engineers, town and country planners, construction companies, building material suppliers, private sector, local communities
3	Institutional Strengthening	Lack of knowledge to access climate change adaptation funds	Lack of capacity to enable direct access to climate finance such as gaining National Designated Authority for the Green Climate Fund and accreditation with other financing facilities Lack of knowledge to ensure sufficient funds are available for on	[2] Lack of access to existing knowledge; [3] Lack of actionable knowledge (e.g., in need of repackaging existing knowledge);	Climate change officers, finance officers, relevant sector officers, NGOs, CSOs, faith based organisations, local communities

Ranking	Thematic area	Title	Description (including the reasons why it is considered a gap)	Cluster	Target Knowledge User
			ground project implementation and meeting obligations to UNFCCC Lack of awareness amongst agencies and communities on climate change finance	[4] Lack of tools and methods to process knowledge into actionable form	
4	Health	Inadequate Early Warning System for health	Insufficient information dissemination to prepare against water bourne diseases, vector bourne diseases and malnutrition. Inadequate early warning system limiting timely interventions for disease control that is site specific and takes into account local climate and health relationships and local cultural factors. Inadequate early warning system limiting rapid and accurate disease notification;	[4] Lack of tools and methods to process knowledge into actionable form;	Environmental health officers, epidemiologist, health inspectors, water officers, local communities, schools, NGOs, CSOs, faith based organisations
5	Social Protection and Gender (marginalized/vulnerable groups)	Lack of data on Gender	Lack of sex disaggregated data, climate change and other sectors	[1] Lack of data (or limited data);	Project designers and implementers, policy makers, decision makers
6	Human health	Lack of information to understand the impacts of climate change on food security and health (i.e.	Lack on data on climate change and impacts on malnutrition in all of its forms, including obesity, undernutrition, and other dietary	[1] Lack of data (or limited data);	Health professionals,

Ranking	Thematic area	Title	Description (including the reasons why it is considered a gap)	Cluster	Target Knowledge User
		nexus of Climate change, food security and health)	risks. Limited assessment on the impact on vulnerable groups in particular, including babies, children, and pregnant women	[2] Lack of access to existing knowledge; [4] Lack of tools and methods to process knowledge into actionable form	Food nutritionists, food security officials, communities
7	Infrastructure and human settlements	Lack of knowledge of climate change impacts on human settlements	Lack of a comprehensive study and hazard mapping of climate-change implications for human settlements Coastal communities and urban centers (including capital cities) are prone to natural hazards such as cyclones, storm surges, coastal and riverine erosion, landslides, floods and sea level rise. Landslides are posing a significant threat to lives and infrastructure. The occurrence and impacts are difficult to quantify due to limited data. Insufficient data to determine if there has been a trend in frequency or intensity of cyclones over the past few decades. Lack of data to quantify the frequency and impacts of landslides	[1] Lack of data (or limited data)	Civil engineers, town and country planners, construction companies, building material suppliers, private sector, local communities

Ranking	Thematic area	Title	Description (including the reasons why it is considered a gap)	Cluster	Target Knowledge User
8	Social Protection and Gender (marginalized/vulnerable groups)	Lack of access to Early Warning System by youth and remote communities	Youth and remote communities have differing access rates to information and early warning systems	[3] Lack of actionable knowledge (e.g., in need of repackaging existing knowledge); [4] Lack of tools and methods to process knowledge into actionable form;	Social workers, local government, town and country planning, natural disaster management officers, NGOs, CSOs, faith based organisations, youth groups, remote communities
9	Water resources	Lack of tools and methods to assess climate change impacts on water resources for water conservation and management (link to fisheries, agriculture and health)	Lack of tools and methods to assess impact, vulnerability of shoreline erosion and impact on groundwater sources, design water resources supply during drought and floods, and water use in agriculture activities (reword)	[2] Lack of access to existing knowledge; [4] Lack of tools and methods to process knowledge into actionable form;	Water experts, town and country planners
10	Institutional strengthening	Lack of tools to integrate traditional knowledge for adaptation and disaster risk reduction	Establish a special program to promote, strengthen and coordinate the use of traditional knowledge and technology for adaptation and disaster risk reduction	[4] Lack of tools and methods to process knowledge into actionable form;	Climate change officers, environment officers, local communities, NGOs, CSOs
11	Human health	Lack of information and tools to assess impact of climate change on mental/psychosocial	Lack of information and tools to assess impact of climate change on mental/psychosocial health	[1] Lack of data (or limited data);	Health professionals

Ranking	Thematic area	Title	Description (including the reasons why it is considered a gap)	Cluster	Target Knowledge User
		health, particularly mental/psychosocial health from a Pacific perspective.		[2] Lack of access to existing knowledge; [4] Lack of tools and methods to process knowledge into actionable form	Psychologists, social health staff, counsellors, health inspectors, post disaster assessment officers
12	Institutional strengthening	Lack of data to assess impacts of climate change and to develop cost-effective solutions	Lack of data to assess the impact of climate change and in identifying a cost-effective response is the uncertainty surrounding estimates of the time and magnitude of the changes to be expected. Difficulty lies in the complexity of predicting the changes, uncertainty over future global emission pathways, the short history and variability of the historical data, and the problem of clearly distinguishing between cyclical effects (climate variability) and long-run climate change impacts.	[1] Lack of data (or limited data); [2] Lack of access to existing knowledge; [4] Lack of tools and methods to process knowledge into actionable form;	Climate change officers, bank officers, insurance officers, town and country planners, finance officers
13	Water resources	Lack of knowledge and tools for monitoring water sources	Lack of capacity to identify water sources and their volume, map groundwater flows	[2] Lack of access to existing knowledge; [4] Lack of tools and methods to process	Water experts, agriculture officers, health officers, town and country planners

Ranking	Thematic area	Title	Description (including the reasons why it is considered a gap)	Cluster	Target Knowledge User
				knowledge into actionable form;	
14	Information and Communications Technology	Lack of access to meteorological data in climate change decision making	The use of existing meteorological information is limited to specific agencies, and this information needs to be tailored to decision makers across a wider series of sectors.	[1] Lack of data (or limited data); [2] Lack of access to existing knowledge; [3] Lack of actionable knowledge (e.g., in need of repackaging existing knowledge); [4] Lack of tools and methods to process knowledge into actionable form;	All relevant sectors
15	Information and Communications Technology	Lack of access to climate risks information to inform policy and planning	Inaccessibility of information such as hazard mapping, socioeconomic data and season and climate projections by development planners, communities and private sector to enhance their understanding of climate risks Lack of access to relevant climate data and information to enhance understanding by policy developers and planners of climate risk. Such	[1] Lack of data (or limited data); [4] Lack of tools and methods to process knowledge into actionable form;	Policy developers, town and country planning, environment officers, fisheries officers, agriculture officers

Ranking	Thematic area	Title	Description (including the reasons why it is considered a gap)	Cluster	Target Knowledge User
			climate data include hazard maps, socioeconomic data and season and climate projections. Modelling of storm-surge zones, taking into consideration possible sea-level rise. Planning mechanisms can subsequently be used to direct all new investments in infrastructure, housing construction, and agriculture outside this zone to minimize vulnerability, reduce repair costs and decrease disruption to economic activities.		
16	Coastal and marine ecosystems	Lack of knowledge to monitor coastal and marine ecosystems	Insufficient technical capacity for monitoring ecosystems to protect natural resources from coastal development pressures and overexploitation coupled by climate change. Insufficient use of high-resolution satellite imagery and Global Positioning Satellite (GPS) technology to detect harmful algal blooms that can smother reefs and to monitor elevated sea surface temperatures, which can cause coral bleaching	[2] Lack of access to existing knowledge; [4] Lack of tools and methods to process knowledge into actionable form;	Fisheries officers, environment officers, NGOs, CSOs, faith based organisations, local communities

Ranking	Thematic area	Title	Description (including the reasons why it is considered a gap)	Cluster	Target Knowledge User
			Insufficient system and information for monitoring and mapping of coastal habitat specifically seaweeds, sea grass etc.		
17	Water resources	Lack of methods and tools for analyzing water quality and quantity due to impacts of climate change	Lack of understanding on how water supplies will be impacted by rising temperatures and climate change, particularly in the smaller atoll nations that are dependent on rainwater Software for analysing hydrological data Tools/technology/equipment needed to analyse/test/monitor water quality/quantity. (this is hardware unless they lack capacity to use these tools?)	[1] Lack of data (or limited data); [3] Lack of actionable knowledge (e.g., in need of repackaging existing knowledge); [4] Lack of tools and methods to process knowledge into actionable form;	Water experts, agriculture officers, health officers, country and town planners
18	Institutional Strengthening	Lack of knowledge to conduct Technology Needs Assessment	Insufficient capacity to conduct Technology Needs Assessments & Technology Transfer Insufficient information on technology transfer Lack of qualified staff in transferring technology	[2] Lack of access to existing knowledge; [4] Lack of tools and methods to process knowledge into actionable form	Climate change officers, energy officers, fisheries officers, agriculture officers, water experts

Ranking	Thematic area	Title	Description (including the reasons why it is considered a gap)	Cluster	Target Knowledge User
19	Institutional Strengthening	Lack of knowledge to assess climate change vulnerability and adaptation (V &A)	Lack of adequate information to support vulnerability and adaptation assessments Lack of knowledge of V&A toolkits, community planning, GIS, community engagement Limited capacity for integrated assessments of risks, including gaps in enforcement of environmental impact assessments, cost benefit analyses and feasibility studies	[1] Lack of data (or limited data); [2] Lack of access to existing knowledge; [3] Lack of actionable knowledge (e.g., in need of repackaging existing knowledge); [4] Lack of tools and methods to process knowledge into actionable form;	Climate change officers, environment officers
20	Human health	Lack of data on health system to monitor impacts of climate change against climate sensitive diseases	Lack of or incomplete disease surveillance or health data and data collection systems on monitoring of climate change against climate-sensitive infectious vector borne and water bourne diseases such as malaria, leptospirosis and typhoid fever. To include the use of GIS. Lack of knowledge on links between incidence of vector-born and water-borne diseases and climatic parameters such as rainfall and temperature.	[1] Lack of data (or limited data); [4] Lack of tools and methods to process knowledge into actionable form	Environmental health officers, epidemiologist, health inspectors, water officers

Ranking	Thematic area	Title	Description (including the reasons why it is considered a gap)	Cluster	Target Knowledge User
			Lack of data to predict disease outbreaks		
21	Social protection and gender (marginalized and vulnerable groups)	Lack of integrated Early Warning System to facilitate information flow before and after events	Lack of integrated Early Warning System to facilitate information flow before and after events to include people with disabilities. Improvement is required to ensure it reaches vulnerable communities in time and in a language they can understand.	[3] Lack of actionable knowledge (e.g., in need of repackaging existing knowledge); [4] Lack of tools and methods to process knowledge into actionable form;	Social workers, local government, town and country planning, natural disaster management officers, NGOs, CSOs, faith based organisations
22	Infrastructure and human settlements	Lack of monitoring tools to identify hazard areas in order to mitigate flooding	Lack of monitoring tools to identify hazard areas in the country for flooding in highlands, coastal regions and islands Mapping and planning to mitigate flooding are needed using a blended approach of traditional knowledge and modern infrastructure tools and methods Promote the use of drone GIS mapping, artificial intelligence (AI) and internet of things (IoT) technology to mitigate flooding, both inland and islands.	[4] Lack of tools and methods to process knowledge into actionable form;	Civil engineers, town and country planners, construction companies, building material suppliers, private sector, local communities Water experts, agricultural officers, health inspectors

Ranking	Thematic area	Title	Description (including the reasons why it is considered a gap)	Cluster	Target Knowledge User
			GIS and Remote Sensing Tools could be used to ensure connectivity and linkages between landslides and rainfall patterns and intensity		
23	Water resources	Lack of effective awareness raising activities for water and public health	Lack of community education, awareness and participation in freshwater management, conservation and protection. Lack of awareness on the various other water sources such as rainwater harvesting and desalination. Communication strategy and tools to promote health and sanitation	[3] Lack of actionable knowledge (e.g., in need of repackaging existing knowledge); [4] Lack of tools and methods to process knowledge into actionable form;	NGOs, CSOs, faith based organisations, local communities
24	Agriculture, fisheries, livestock and forestry	Lack of access to information on sustainable agricultural practices	Farmers lack of access to information and knowledge of cropping systems in order to adjust agriculture practices to prepare for climate change such as mixed cropping, mulching, composting. Farmers lack of information/understanding of the impacts of climate change on their cropping systems.	[3] Lack of actionable knowledge (e.g. in need of repackaging existing knowledge) [4] Lack of tools and methods to process knowledge into actionable form	Subsistence and commercial farmers, local communities

Ranking	Thematic area	Title	Description (including the reasons why it is considered a gap)	Cluster	Target Knowledge User
25	Infrastructure and human settlements	Lack of data knowledge to mainstream climate change into infrastructure and settlement plans	Lack of policies, legislation and enforcement (policy gap not K gap) Lack of knowledge, information and capacity to mainstream climate change into infrastructure and settlement plans across the region there are many examples of new housing types being built after cyclones, associated with resettlement projects, and just because. Some use imported materials, some use local materials, there are different designs and standards, and associated technologies for water, power, and sewerage (Ok, the latter are common). A database of types, their performance, who provides them, and their costs and benefits would be really helpful.	[2] Lack of access to existing knowledge;	Urban Planners, utilities, decision makers
26	Institutional Strengthening	Lack of tools and methods to mainstream climate change in various development planning and processes	Lack of environmental and climate risk in development planning processes. Need to improve capacity to lead mainstreaming process. Need for tools such as strategic environment assessment, multi-criteria analysis, integrated	[4] Lack of tools and methods to process knowledge into actionable form;	All government ministries Ministry of Finance, Climate Change, Environment, Health, Agriculture, Fisheries, Infrastructure, Water

Ranking	Thematic area	Title	Description (including the reasons why it is considered a gap)	Cluster	Target Knowledge User
			vulnerability assessments, as well as gender analysis and action plans to support development planning and integration process.		
27	Institutional strengthening	Lack of knowledge on impacts of climate change on various sectors	There is need to translate the climate science and predicted impacts into local language so all communities can prepare accordingly. Lack of awareness on climate change in general, and its impacts on the specific sectors in particular across all levels of the government and the public and even within the relevant sectors	[2] Lack of access to existing knowledge; [3] Lack of actionable knowledge (e.g., in need of repackaging existing knowledge); [4] Lack of tools and methods to process knowledge into actionable form;	All sectors, private sector, NGOs, CSOs, faith based organisations
28	Information and communication technology	Lack of tools for information and knowledge sharing between government and stakeholders	Lack of protocols for integrated data and information sharing and management Need for adaptation knowledge sharing, coordination and collaboration among ministries as well as with non-governmental organisations (NGOs), the private sector, faith-based organisations and development partners	[3] Lack of actionable knowledge (e.g., in need of repackaging existing knowledge); [4] Lack of tools and methods to process knowledge into actionable form;	All relevant government ministries, non-governmental organisations (NGOs), private sector, faith-based organisations and development partners

Ranking	Thematic area	Title	Description (including the reasons why it is considered a gap)	Cluster	Target Knowledge User
29	Human health	Lack of substantial evidence on impact of climate change on non-communicable diseases	No recent context-specific research on climate change and non-communicable diseases in the subregion, despite notable increase in rates of non-communicable diseases	[1] Lack of data (or limited data); [2] Lack of access to existing knowledge; [4] Lack of tools and methods to process knowledge into actionable form	Environmental health officers, epidemiologist, health inspectors, water officers, local communities, schools, NGOs, CSOs, faith based organisations
30	Information and communication technology	Lack of a database of adaptation practices, classified by sector, with examples from across the region	Lack of data and information on adaptation activities and practices, lessons leant	[3] Lack of actionable knowledge (e.g., in need of repackaging existing knowledge);	National government climate change officials, project developers, academia, regional organisations, communicators, project designers
31	Institutional strengthening	Lack of tools and methods to conduct risk assessment of climate change at sector level	Lack of understanding of climate change risks and risk assessments by various sectors in order to integrate climate risks into respective sectors	[1] Lack of data (or limited data); [2] Lack of access to existing knowledge; [3] Lack of actionable knowledge (e.g., in	All relevant sectors, decision makers, town and country planners

Ranking	Thematic area	Title	Description (including the reasons why it is considered a gap)	Cluster	Target Knowledge User
			Lack of specific information and data on current and future vulnerability and risks across the sectors is hindering meaningful action on climate change. This issue is exacerbated by the lack of sector specific information and data, or information and data management systems, in key sectors such as health and water	need of repackaging existing knowledge); [4] Lack of tools and methods to process knowledge into actionable form;	
32	Agriculture, fisheries, livestock and forestry	Lack of tools and methods for understanding of future impacts of climate change on agriculture and food production	This gap has several components: • Lack of agrometeorological data on climate change and variability in order to manage food production and supply. • Lack of climate models and cropping calendars to be made available for future production and minimize food shortages. • Lack of Early warning and forecasting information/systems to all	[1] Lack of data (or limited data); [2] Lack of access to existing knowledge; [3] Lack of actionable knowledge (e.g., in need of repackaging existing knowledge); [4] Lack of tools and methods to process knowledge into actionable form	Agriculture Extension Officers, subsistence and commercial farmers, health inspectors, water officers, land use planning officers

Ranking	Thematic area	Title	Description (including the reasons why it is considered a gap)	Cluster	Target Knowledge User
			communities including information on disaster impacts on agriculture and water etc. • Lack of information on agriculture insurance, probing an indemnity insurance framework, weather index setup, linking with multi-hazard early warning systems, etc. for disaster risk management in agriculture • Lack of development and application of satellite forecasting for the planning and agriculture sectors		
33	Human health	Lack of knowledge on customary and modern strategies, tools and methods for monitoring and managing disease vectors such as mosquitos	Modelling of changes in risk of transmission of mosquito-borne diseases	[1] Lack of data (or limited data); [2] Lack of access to existing knowledge;	Environmental health officers, epidemiologist, health inspectors, water officers, local communities, schools, NGOs, CSOs, faith based organisations

Ranking	Thematic area	Title	Description (including the reasons why it is considered a gap)	Cluster	Target Knowledge User
				[3] Lack of actionable knowledge (e.g., in need of repackaging existing knowledge); [4] Lack of tools and methods to process knowledge into actionable form	
34	Infrastructure and human settlements	Lack of knowledge on migration and displacement due to impacts of climate change	Gaps contextualizing issues, community's movement, best practices and tools Additional policy examples, case studies Research underway/existing for migration and settlements Understanding from around the region regarding displacement e.g. Fiji Displacement guidelines Planned migration and ad hoc migration in response to disaster	[1] Lack of data (or limited data); [2] Lack of access to existing knowledge; [3] Lack of actionable knowledge (e.g., in need of repackaging existing knowledge); [4] Lack of tools and methods to process knowledge into actionable form	Communities, policy makers, planners, immigration officers, social workers, utility service providers, DRM officers

Ranking	Thematic area	Title	Description (including the reasons why it is considered a gap)	Cluster	Target Knowledge User
35	Social Protection and gender (marginalized and vulnerable groups)	Lack of knowledge to design/implement social protection initiatives (link to Gender)	Lack of information and knowledge on social protection	[2] Lack of access to existing knowledge;	communities, farmers, fishers, project designers
36	Institutional strengthening	Lack of knowledge of climate science and tools and methods to monitor impacts of climate change	Lack of knowledge of basic climate science, competencies based on International Meteorological Service standards Specialized training for officers in forecasting, modelling, early warning systems, ocean monitoring, agro-meteorology and sea level monitoring Use of projections in adaptation planning needs a strong advocacy program to put it to use and for stakeholders to use them in everyday planning as a forward looking tool and adapting to climate change. Climate projections should be used for conducting EIA and the Meteorological Service (projection scenarios) should be involved in the production of EIAs.	[1] Lack of data (or limited data); [2] Lack of access to existing knowledge; [3] Lack of actionable knowledge (e.g., in need of repackaging existing knowledge); [4] Lack of tools and methods to process knowledge into actionable form;	Meteorology officers

Ranking	Thematic area	Title	Description (including the reasons why it is considered a gap)	Cluster	Target Knowledge User
37	Information and communication technology	Lack of tools and skills for downscaling climate scenarios	Limited capacity, tools and local data to enable downscaling of climatic variations and impacts Downscaling of Global climate models is vital for developing more reliable localized projections. (find where suitable)	[1] Lack of data (or limited data); [2] Lack of access to existing knowledge; [3] Lack of actionable knowledge (e.g., in need of repackaging existing knowledge); [4] Lack of tools and methods to process knowledge into actionable form;	Climate change officers, agriculture officers, water experts, health officers, town and country planners, NGOs, CSOs, faith based organisations
38	Information and communication technology	Lack of use of communication tools (applications and social media) as a medium to communicate climate change information	Lack of knowledge for developing climate change apps for specific audiences	[2] Lack of access to existing knowledge; [3] Lack of actionable knowledge (e.g., in need of repackaging existing knowledge); [4] Lack of tools and methods to process knowledge into actionable form	farmers, service providers (NGOs, govt agencies, international partners)

Ranking	Thematic area	Title	Description (including the reasons why it is considered a gap)	Cluster	Target Knowledge User
39	Institutional strengthening	Lack of tools and methods for undertaking vulnerability mapping, adaptation planning and implementation of adaptation interventions,	Limited capacity at the community level to undertake local level vulnerability mapping, adaptation planning and the implementation of priority adaptation interventions.	[2] Lack of access to existing knowledge;	local communities, NGOs, CSOs
40	Coastal and marine ecosystem	Lack of scientific data and/access to data on coral reef monitoring	Lack of data and research into the adaptation of coral reefs to determine natural adaptive response to higher sea surface and air temperature. Clarity around applications to access to research for end users. Lack of research on nature-based solutions and hybrid technology? Lack of knowledge of sedimentation – coral reef dynamics in a changing climate	[1] Lack of data (or limited data); [2] Lack of access to existing knowledge; [2] Lack of access to existing knowledge;	Fisheries officers, environment officers, NGOs, CSOs, faith based organisations, local communities
41	Agriculture, fisheries, livestock and forestry	Lack of access to knowledge of crop resilience skills	Lack of access to knowledge in crop adaptability, crop seasonal cycles, crop/food preservation skills, traditional skills, pest/weed control skills, traditional agri-forestry/agroforestry (to reduce deforestation)	[2] Lack of access to existing knowledge [3] Lack of actionable knowledge (e.g., in need of repackaging existing knowledge);	Subsistence and commercial farmers, local communities

Ranking	Thematic area	Title	Description (including the reasons why it is considered a gap)	Cluster	Target Knowledge User
				[4] Lack of tools and methods to process knowledge into actionable form	
42	Terrestrial ecosystems	Lack of data on erosion hotspots	Lack of data on erosion hotspots and the lands and seas around them, which is needed for modelling possible interventions before piloting them in the field (this is very relevant for nature-based solutions). Highlands have high erosion hotspots as a result of soil type, cropping practices used mono culture over a vast area of land. Research on rainfall erosivity (capacity of rain to produce erosion) and soil erodibility (susceptibility of the soil to be eroded).		Agriculture officers, land use planners, utility service providers, communities, conservation officers, farmers
43	Agriculture, fisheries, livestock and forestry	Lack of data to assess the impacts of climate change on fisheries monitoring such as fish stocks	Lack of data to assess the impacts of climate change on fisheries such as ocean observation and monitoring data such as wave, sea-level rise, ocean acidification, coral bleaching and geospatial	[1] Lack of data (or limited data); [2] Lack of access to	Fisheries officers, commercial fishing companies, local communities

Ranking	Thematic area	Title	Description (including the reasons why it is considered a gap)	Cluster	Target Knowledge User
		(Fisheries off shore and near shore)	information on climate and ocean processes which may impact tuna stocks, invasive fish species and ciguatera poisoning. A lack of understanding of actual fisheries stock that will make it more difficult to set foreign fishing fees for the future. Insufficient evidence exists to conclusively assess climate change impact on fisheries.	existing knowledge; [3] Lack of actionable knowledge (e.g., in need of repackaging existing knowledge); [4] Lack of tools and methods to process knowledge into actionable form	
44	Agriculture, fisheries, livestock and forestry	Lack of knowledge and tools for land use and land use management practices	Lack of Knowledge on mainstreaming climate change into agriculture land use planning Lack of actionable information on integrated land use planning – e.g. policies, strategies, legislation	[2] Lack of access to existing knowledge; [3] Lack of actionable knowledge (e.g., in need of repackaging existing knowledge); [4] Lack of tools and methods to process knowledge into actionable form	Agriculture Extension Officers, subsistence and commercial farmers Planning officers (refine term)

Ranking	Thematic area	Title	Description (including the reasons why it is considered a gap)	Cluster	Target Knowledge User
45	Infrastructure and human settlements	Lack of data for understanding climate change impacts on public assets	Lack of data for climate change impacts on public assets such as power lines, telecommunications and government buildings	[1] Lack of data (or limited data); [4] Lack of tools and methods to process knowledge into actionable form;	Civil engineers, town and country planners, construction companies, building material suppliers, private sector, local communities
46	Human health	Lack of information on impacts of climate change on health-related illness, morbidity, mortality, and productivity	Heatwaves in the Pacific region increase the risk of heat-related injuries and death, and dehydration. There is limited research in the Pacific about the impact of climate change on these particular health issues and their longer-term impacts	[1] Lack of data (or limited data); [2] Lack of access to existing knowledge; [4] Lack of tools and methods to process knowledge into actionable form	Health professionals
47	Terrestrial ecosystem	Lack of tools (e.g. GIS) for land use and land use management (link to Human Settlement)	Insufficient use of GIS for land use planning	[4] Lack of tools and methods to process knowledge into actionable form;	Agricultural officers, forestry officers, town and country planning
48	Infrastructure and human settlements	Lack of knowledge to utilize information on climate change impacts to	Lack of capacity to develop certification standards for climate-proofing transport infrastructure	[1] Lack of data (or limited data);	Civil engineers, town and country planners, construction companies, building

Ranking	Thematic area	Title	Description (including the reasons why it is considered a gap)	Cluster	Target Knowledge User
		design climate-resilient infrastructure	and establishing enforcement measures to ensure compliance. Limited information on climate change impacts is available to engineers designing and constructing the infrastructures around the country Negative impact of poorly designed infrastructure on the environment due to lack of capacity, understanding natural processes and resources; e.g. seawalls causing erosion or causeways harming marine habitats.	[2] Lack of access to existing knowledge;	material suppliers, private sector, local communities
49	Coastal and marine ecosystem	Lack of knowledge to integrate ecosystem-based adaptation into programme design and lack of knowledge of the limits to EBA in the face of future climate change.	Lack of integration of EBA into development, climate change adaptation responses, natural resource management policy and planning processes, traditional conservation taboos, Marine Protected Areas Lack of awareness amongst private sector and NGOs to support the integration of EBA into programme design with a focus on the potential of green, nature-based, or hybrid infrastructure solutions in reducing	[2] Lack of access to existing knowledge; [4] Lack of tools and methods to process knowledge into actionable form;	Fisheries officers, environment officers, NGOs, CSOs, faith based organisations, local communities

Ranking	Thematic area	Title	Description (including the reasons why it is considered a gap)	Cluster	Target Knowledge User
			vulnerability to environmental and climate risk. Lack of tools to document and share traditional knowledge for EBA Lack of community involvement		
50	Agriculture, fisheries, livestock and forestry	Lack of knowledge on soil health, soil fertility and water management in agriculture	Lack of knowledge on improved soil carbon, soil health, soil fertility and practices that maintain or enhance soil health. Knowledge and access to information and CSA practices on water management in agriculture	[2] Lack of access to existing knowledge; [3] Lack of actionable knowledge (e.g., in need of repackaging existing knowledge); [4] Lack of tools and methods to process knowledge into actionable form	Agriculture Extension Officers, subsistence and commercial farmers
51	Coastal and marine ecosystems	Lack of knowledge on ocean acidification adaptation solutions	There is work being done but often technical and not actionable	[2] Lack of access to existing knowledge	coastal communities

Ranking	Thematic area	Title	Description (including the reasons why it is considered a gap)	Cluster	Target Knowledge User
52	Social protection and gender (marginalized and vulnerable groups)	Lack of knowledge of environmental and social safeguards	Lack of application of environmental and social safeguard screening and knowledge of processes relating to environmental and social safeguards	[4] Lack of tools and methods to process knowledge into actionable form;	Project developers, project managers, project beneficiaries
53	Human health	Lack of communication tools to raise awareness regarding impacts of climate change and extreme weather events on public health	Lack of education programmes/public awareness of the impacts on climate change and extreme weather events such as droughts, flooding, temperature on human health and responses to aftermath	[3] Lack of actionable knowledge (e.g., in need of repackaging existing knowledge); [4] Lack of tools and methods to process knowledge into actionable form	Local communities, schools, NGOs, CSOs, faith based organisations
54	Coastal and marine ecosystem	Lack of data to monitor mangroves	Absence of baseline data on mangrove position and parameters.	[1] Lack of data (or limited data);	Environment officers, fisheries officers
55	Human health	Lack of a systematic data collection and information systems for health and climate change data	Lack of functioning Health Information Systems and data collection systems Lack of capacity to management health information systems Information must be timely to ensure timely response such as the above early warning system.	[1] Lack of data (or limited data); [4] Lack of tools and methods to process	Environmental health officers, epidemiologist, health inspectors, water officers

Ranking	Thematic area	Title	Description (including the reasons why it is considered a gap)	Cluster	Target Knowledge User
56	Human health	Lack of understanding of climate change impacts on the health sector	Lack of data on the impacts on climate change and extreme weather events such as droughts, flooding, temperature change on human health Limited understanding of climate change within the health sector	[1] Lack of data (or limited data); [2] Lack of access to existing knowledge; [3] Lack of actionable knowledge (e.g., in need of repackaging existing knowledge); [4] Lack of tools and methods to process knowledge into actionable form	Environmental health officers, epidemiologist, health inspectors, water officers, local communities, schools, NGOs, CSOs, faith based organisations
57	Infrastructure and human settlements	Lack of knowledge of climate proofing of human settlements certification	Lack of knowledge on climate-resilient of climate proofing of human settlements certification to rebuild post natural disaster.	[2] Lack of access to existing knowledge; [4] Lack of tools and methods to process knowledge into actionable form;	Civil engineers, town and country planners, construction companies, building material suppliers, private sector, local communities

Ranking	Thematic area	Title	Description (including the reasons why it is considered a gap)	Cluster	Target Knowledge User
58	Institutional strengthening	Lack of access to national climate change research data and information	Lack of an information system to track climate related research and make it accessible to relevant stakeholders. Informed decision making requires accurate, consistent and timely provision of advices which should be based on factual, science-based and rigorous planning.	[1] Lack of data (or limited data); [2] Lack of access to existing knowledge;	Decision makers, climate change officers, environment officers, town and country planners, project/programme developers, academic researchers
59	Coastal and marine ecosystem	Lack of knowledge and tools for mangrove monitoring	Lack of capacity to produce maps of mangrove boundaries, topographic information, and locations of coastal roads and development, and use these products to assess site-specific mangrove vulnerability to projected sea level rise	[4] Lack of tools and methods to process knowledge into actionable form;	Environment officers, fisheries officers,
60	Agriculture, fisheries, livestock and forestry	Insufficient research data on climate resilient crops	This gap has several components: • Lack of data and information of climate resilient crops that are able to survive extreme climate events such as flooding, droughts and high soil salinity	[1] Lack of data (or limited data); [2] Lack of access to existing knowledge;	Agriculture Extension Officers, subsistence and commercial farmers

Ranking	Thematic area	Title	Description (including the reasons why it is considered a gap)	Cluster	Target Knowledge User
			• Lack of adoption of SLM technologies due to mismatch in agricultural priorities. • Lack of an agricultural gene bank in some countries • Lack of research to develop climate-adaptive crops/food supply in the islands and hinterland		
61	Social protection and gender (marginalized and vulnerable groups)	Lack of tools to manage data and information for 'vulnerable' people	Lack of a registry for vulnerable people ascertained using a robust and common vulnerability framework as it would enhance efforts to support low-income and otherwise disadvantaged groups and support monitoring and evaluation of progress at national and sub-national level	[1] Lack of data (or limited data); [4] Lack of tools and methods to process knowledge into actionable form;	Social workers, local government, town and country planning, natural disaster management officers, NGOs, CSOs, faith based organisations
62	Agriculture, fisheries, livestock and forestry	Lack of information on Livestock Management	Lack of data, data storage, and accessing existing information Lack of information on and/or access to information on proper	[1] Lack of data (or limited data);	Livestock farmers, small scale farmers

Ranking	Thematic area	Title	Description (including the reasons why it is considered a gap)	Cluster	Target Knowledge User
			animal husbandry and CSA management practices Livestock feed formulation, use of legumes and other locally available alternatives Lack of knowledge and information on farm bio-security Lack of information available to farmers on impacts of climate change on livestock, livestock practices to both resilient and mitigation efforts (even at small scale)	[2] Lack of access to existing knowledge; [3] Lack of actionable knowledge (e.g., in need of repackaging existing knowledge);	
63	Information and communication technology	Lack of data to meet reporting obligations to UNFCCC	Lack of accurate and reliable data for the national communication process and other UNFCCC reporting obligations Lack of systematic data collection and sharing between government agencies	[1] Lack of data (or limited data);	Climate change officers, environment officers and all relevant ministries and offices involved in NC process
64	Coastal and marine ecosystem	Lack of Wave Modelling data for determining impact of climate change on coral reefs	Lack of wave modelling data to enhance understanding on the impact of waves on coral reefs and its significant relationship with the climate change and sea level rise.	[2] Lack of access to existing knowledge; [4] Lack of tools and methods to process	Fisheries officers, environment officers, NGOs, CSOs, faith based organisations, local communities

Ranking	Thematic area	Title	Description (including the reasons why it is considered a gap)	Cluster	Target Knowledge User
			Lack of wave damage risk maps	knowledge into actionable form;	
65	Agriculture, fisheries, livestock and forestry	Lack of knowledge and/or access to information on nutrients use and manure management for climate resilient agriculture system	Lack of information and practices and access to information on nutrient use and manure management towards climate resilient agriculture systems	[2] Lack of access to existing knowledge; [3] Lack of actionable knowledge (e.g., in need of repackaging existing knowledge);	Farmers

Annex 3: Agenda of the priority-setting workshop

DAY 1: Opening and setting the scene	
12:00-12:15	Opening remarks: Kosi Latu, Director General of SPREP Youssef Nassef, Director, Adaptation Division, UNFCCC Secretariat Sefanaia Nawadra, Head, UNEP Pacific Office, UNEP
12:15-12:30	Introduction and ice-breaker
12:30-12:35	Objective of the workshop and expectation for day 1
Presenting and refining knowledge gaps	
12:35-12:50	Presentation of the results of the scoping paper
12:50-14:20	Refinement of the knowledge gaps
14:20-14:30	Key messages and overview of day 2
Offline exercise	If needed, Reference Group (RG)to continue work in an offline mode and share the list of knowledge gaps via email before start of day 2
DAY 2: Refining and categorizing knowledge gaps and Criteria setting	
12:00-12:05	Expectation for day 2
12:05-12:35	Reporting of the results from day 1 followed by a collective discussion to produce the exhaustive list of identified gaps
12:35-13:20	Identification of criteria for prioritization of the knowledge gaps (plenary session) Assignment of weights to the different criteria (individual exercise by RG members)
13:20-13:35	(Comfort break) Presentation of the weighted criteria (plenary session)
13:35-13:50	
13:50-14:00	
DAY 3: Prioritising knowledge gaps	
12:00-12:10	Recap from day 2 and expectation for day 3 Presentation of prioritisation methodology
12:10-12:40	Finalise weighting criteria for remaining RG members Address comment on knowledge gaps
12:40-12:55	Break
12:55-13:15	Presentation of weighted criteria
13:15-13:45	First Delphi round for scoring of the priority knowledge gaps (individual exercise by RG members) (plenary session)
13:45-14:00	Break

14:00-14:30	Offline exercise to complete prioritization exercise
Offline exercise	Reference group members will suggest responsible relevant institutions and indicative actions (innovative long -term approaches, entry points and alignment with relevant regional/international processes, resource mobilization) to close the priority knowledge gaps
DAY 4: Closing knowledge gaps and next steps	
12:00-12:10	Recap from day 3 and expectation for day 4
12:10-13:10	Presentation and discussion of delphi round 1 results
13:10-13:40	Overview of next steps (UNFCCC, UNEP, SPREP) Discussion (plenary)
13:40-13:50	Feedback (survey)
13:50-14:00	Closing

Annex 4: Knowledge gaps for future discussion

Below are the Knowledge GAPS raised by the experts for future consideration. These were not included in the final list of knowledge gaps as these would need more context-specific details.

Cluster: Agriculture, fisheries, livestock and forestry	
Adaptation in forestry	Use of wind breaks, shading, water source protection through forestry
Cluster: Human health	
Lack of correlation between climate and health	through COSPAC project, MalaClim MODEL was trialed in the Solomon Islands focusing more on sub seasonal climate and not focusing on climate change. Need for more research about identifying the thresholds and parameters that correlate with the climate and monitoring that change over time. Share lessons learnt from using sub seasonal climate and health as a model.
Cluster: Infrastructure and human settlements	
Lack of data	Several P-SIDS have capitals on low-lying islands (e.g. Kiribati, RMI, Tonga, Tuvalu) and there is a need for a really strategic approach to engineering those capitals better – Hulhumale in the Maldives is often cited as the exemplar, but it isn't. There's just a whole heap of ambitious thinking and evidence needed here.
Lack of data knowledge to mainstream climate change into infrastructure and settlement plans	Lack of policies, legislation and enforcement (policy gap not K gap) Lack of knowledge, information and capacity to mainstream climate change into infrastructure and settlement plans b. Housing: across the region there are many examples of new housing types being built after cyclones, associated with resettlement projects, and just because. Some use imported materials, some use local materials, there are different designs and standards, and associated technologies for water, power, and sewerage (Ok, the latter are common). A database of types, their performance, who provides them, and their costs and benefits would be really helpful.
Lack of data	On nature-based solutions for coastal erosion: there is a lot of talk but few examples relevant to tropical coasts, what is known needs to be brought together and examples highlighted.
Lack of capturing traditional knowledge on traditional housing	
Lack of knowledge on modern housing technologies	There are portable houses and decentralized systems of power, water and sewerage that might enable settlements to move as coastlines change
Cluster: Coastal and marine ecosystems	
Lack of knowledge on oceans	Lack of knowledge and expertise around ocean dynamics A strong link to oceania knowledge – navigation, inter island mobility food security, traditional knowledge
Lack of data - b. on blue/green shipping: it is often not seen as 'adaptation' but connectivity is key to sustaining livelihoods and improving access to services in rural islands: it is an age old problem but initiatives like the Pacific Blue	Work has commenced with Micronesian region Sustainable shipping options for small islands Sustainable sea transport access to disaster relief adaptation support etc. in remote areas

Shipping partnership add a new focus, and it seems to me there is a need to share what is known and push for more development in this space.	
Lack of knowledge about the responses of reef-facing shorelines to climate change	
Lack of knowledge about the scope from nature based solutions to assist in the protection of reef-facing coastlines	
Lack of effective dissemination of research outputs and data on coral reef monitoring in accessible formats	
Limited data on impact of sediment deposition on coral reefs. Linked to watershed management.	
Cluster: Water resources	
Lack of data on water technologies and practices	A database of water technologies and practices would be helpful – there are lots of different practices out there and if it were all in one place in a database/platform that would make a good menu of options for decision makers
Cluster: Terrestrial ecosystems	
Coastal forests	
Cloud forests (SPREP team to send edits)	
Cluster: Institutional strengthening	
Lack of understanding the factors that drive social change	Tactics from behavioural economics/psychology/social marketing and related fields and the function of communication/engagement in driving change, may be key enabling knowledge to support many of these gaps presented here. Look at social norm change work by Cristina Bicchieri Methodology could be applied to understand existing social norms and what changes could foster social norms that support strategies for governing adaptation
What about Monitoring and Evaluation of adaptation efforts and/or NAPs?	Very few countries have M&E frameworks and systems in place – is this a knowledge gap? There have certainly been recent efforts in this are because it is perceived as a gap.