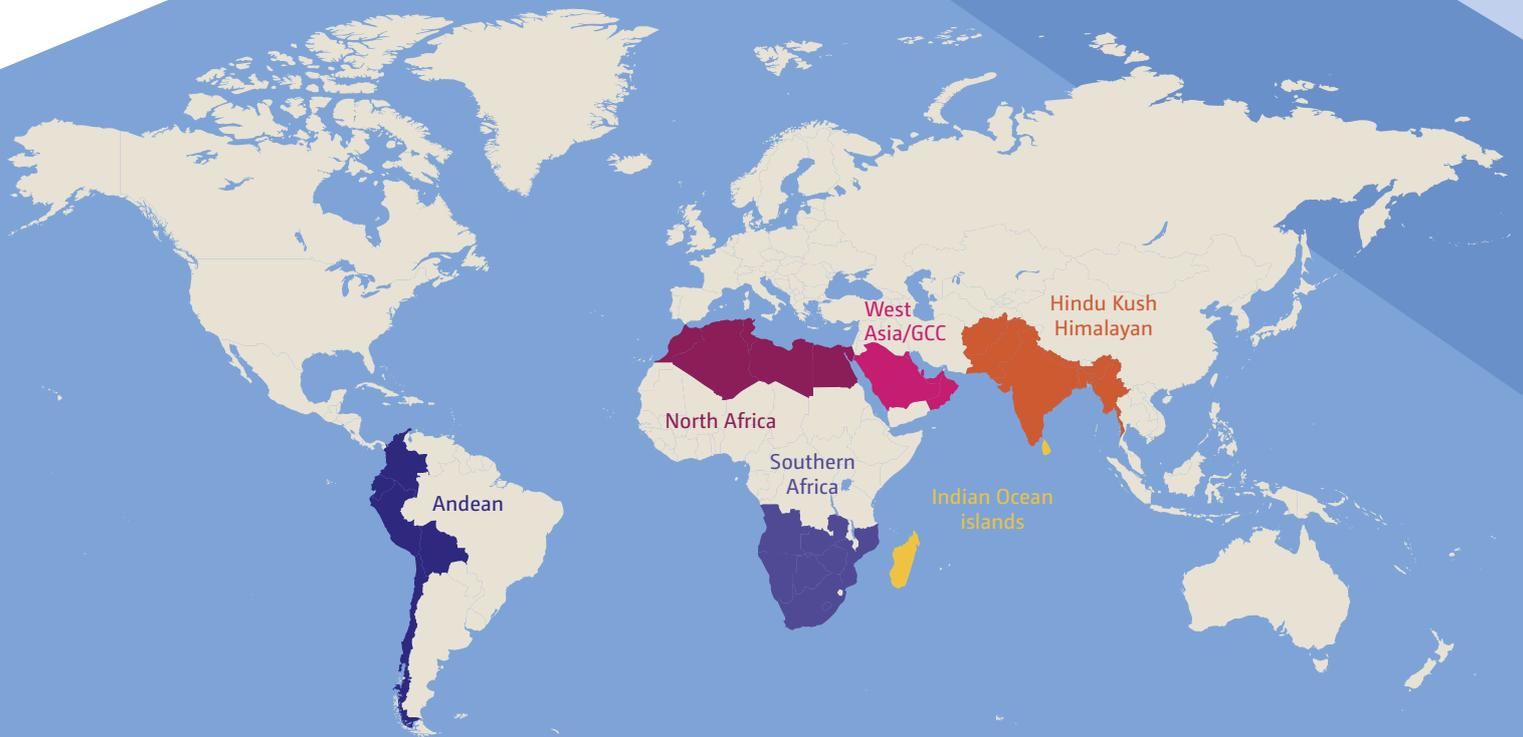


Lima Adaptation Knowledge Initiative:

Closing knowledge gaps to scale up adaptation



6 Subregions **38** Countries **85** Priority knowledge gaps

Knowledge gaps constitute significant barriers to successful climate change adaptation actions, whether it is the absence of knowledge, lack of access to existing knowledge or the disconnect between knowledge holders and users. The Lima Adaptation Knowledge Initiative (LAKI) identifies and prioritizes adaptation knowledge gaps, and catalyzes action to bridge these gaps. This document provides an overview of the first phase of the LAKI.



United Nations
Framework Convention on
Climate Change



Lima Adaptation Knowledge Initiative:

Closing knowledge gaps to scale up adaptation



United Nations
Framework Convention on
Climate Change





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“In order to fully scale up adaptation, we must understand knowledge needs. The LAKI elaborates the reasons behind adaptation knowledge gaps and illuminates a path toward bridging these gaps for end users. We look forward to working with our partners in the next phase to narrow the gaps and expand the LAKI to new subregions.”

Youssef Nassef, Director, Adaptation Programme, UNFCCC Secretariat



Introducing the LAKI

Climate change adaptation knowledge gaps pose significant barriers to successful adaptation actions. Knowledge about adaptation is growing, yet the persistence of such gaps demonstrates the need for further effort to align supply of and demand for adaptation knowledge. It also calls for a better understanding of knowledge gaps faced by practitioners and policymakers on the ground to facilitate the planning and implementation of efficient response actions at regional, national and sub-national levels.

The Lima Adaptation Knowledge Initiative (LAKI) addresses knowledge barriers that impede the implementation and scaling up of adaptation action. LAKI interventions seek to catalyze improved access to data, information and knowledge for end-users, for example, by making information available in the appropriate form for policymakers and practitioners. Facilitated science-policy-practice dialogues accompany a participatory process of knowledge gap identification, categorization and prioritization for specific subregions or thematic domains (e.g. a sector or area of vulnerability). In this way, the LAKI stimulates collaborative action to close knowledge gaps and help stakeholders adapt more effectively to the adverse effects of climate change (see Box 1).

The LAKI is a joint action pledge under the Nairobi work programme (NWP) between the United Nations Framework Convention on Climate Change (UNFCCC) secretariat and the United Nations Environment Programme (UN Environment) through its Global Adaptation Network (GAN). Activities under the initiative support the NWP's role as a knowledge-for-action network for climate resilience under the Convention.

Box 1

Key characteristics of the LAKI:

Generates ownership and legitimacy of the findings;

Directs knowledge and financial resources towards closing knowledge gaps;

Streamlines the process of identifying and prioritizing climate adaptation knowledge gaps, for enhanced replicability;

Fosters collaborative opportunities and resource efficiency by focusing on subregions with shared ecological and climatic characteristics.

Box 2

Scope for LAKI interventions

- > Targets knowledge gaps which can be bridged using existing data, information and knowledge;
- > Facilitates informed application of and/or easy access to information for end users (e.g. through decontextualizing or re-contextualizing, processing, repackaging, synthesizing and disseminating information);
- > Focuses on knowledge gaps that do not require new research, generation/collection of new data, or action related to coordination, institutional processes or practices.

“LAKI is an innovative and successful initiative that can stimulate action to fill important knowledge gaps in the field of adaptation.”

Barney Dickson, Head of Climate Change Adaptation, UN Environment

Who are the LAKI “collaborators” and “experts”?

Subregional coordination entities are core partners in the implementation of the LAKI responsible for hosting and organizing a workshop in their target subregion. Entities are regionally or thematically recognized experts in cross-cutting environmental issues. They have a proven network and convening power of relevant partner institutions and experts from academia, the private sector and civil society. Entities collaborate with the UNFCCC secretariat and UN Environment to facilitate science-policy-practice dialogues and follow up on response actions at various scales.

A **Multistakeholder group (MSG)** of core experts is assembled for each subregional workshop to prioritize knowledge gaps. Members of this group have a thorough understanding of knowledge gaps that impede adaptation action in their subregion. As experts in the needs and challenges associated with ground-level implementation, they are also involved in response actions.

Methodology

The LAKI has consistently applied a rigorous methodology across all six subregions to identify and prioritize adaptation knowledge gaps (see Figure 1).

Key achievements

The UNFCCC secretariat and UN Environment, in partnership with subregional coordination entities, have convened six priority-setting workshops, one for each subregion. The workshops covered a total of 38 countries including 3 small island developing States (SIDS), 11 least developed countries (LDCs), and 13 African countries.

The first phase of the LAKI, as one of the activities under the NWP, has successfully:

- > Showcased a multi-partner collaborative initiative between the UNFCCC secretariat, UN Environment, subregional entities, research institutions, academia, the COP Presidency and the Chair of the SBSTA;
- > Demonstrated the NWP’s extended, catalytic functions to identify, prioritize, and ultimately remove knowledge barriers through robust knowledge development and dissemination processes, as well as successful partnerships;
- > Highlighted the objectivity of the LAKI process in producing authoritative lists of priority knowledge gaps;
- > Fostered ownership of outputs among relevant stakeholders capable of channeling knowledge, financial and in-kind support to close knowledge gaps.

Figure 1 **The LAKI Methodology**



1 Scoping the knowledge gaps

A scoping paper of adaptation knowledge gaps is prepared based on a literature review and input from the subregional coordination entity and multistakeholder group (MSG).

2 Convening a multistakeholder group

A core group of experts is assembled in collaboration with the subregional coordination entity and invited to a **workshop**. A support group representing institutions that could provide resources to close knowledge gaps may also be invited.

4 Prioritizing knowledge gaps and designing response actions

The gaps are prioritized through a quantitative process involving 2 Delphi rounds (workshop day 2).

The MSG drafts potential response actions to close each gap, noting how their organization or others could contribute (workshop day 3).

Workshop outcomes:

- > Categorized list of priority adaptation knowledge gaps
- > List of potential response actions and partners
- > Expressions of interest



3 Refining and categorizing knowledge gaps

The MSG refines the list of knowledge gaps from the scoping paper and categorizes them by type (workshop day 1).



5 Implementing actions and monitoring

UN Environment, UNFCCC, and subregional partners disseminate the workshop results and facilitate science-policy-practice dialogues to ensure the priority gaps are widely understood. Organizations submit action pledges to the Nairobi work programme to implement and report on response actions.



An overview of the priority-setting workshop results

The first phase of the LAKI has been completed for six subregions – Andean, West Asia/Gulf Cooperation Council (GCC), North Africa, Southern Africa, Indian Ocean islands, and Hindu Kush Himalayan. A total of 85 priority adaptation knowledge gaps (hereafter referred to as “priority gaps”) were identified across the six subregions during the priority-setting workshops.

Priority gaps were categorized by the MSGs into clusters, or conditions under which the priority gaps emerge (see Box 3). Clusters two and three fall broadly under the scope of the LAKI interventions.

This overview presents the 85 priority gaps by cluster, thematic area, and subregion. Commonalities and differences both within and between the subregions are highlighted with a view to advance collaborative opportunities and catalyse response actions to help bridge these priority gaps in a timely and resource-efficient way.

Box 3

Priority gap 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;
- [Mix] – An additional cluster, referred to as mix, captures priority knowledge gaps that fall under a combination of two or more of the four clusters.



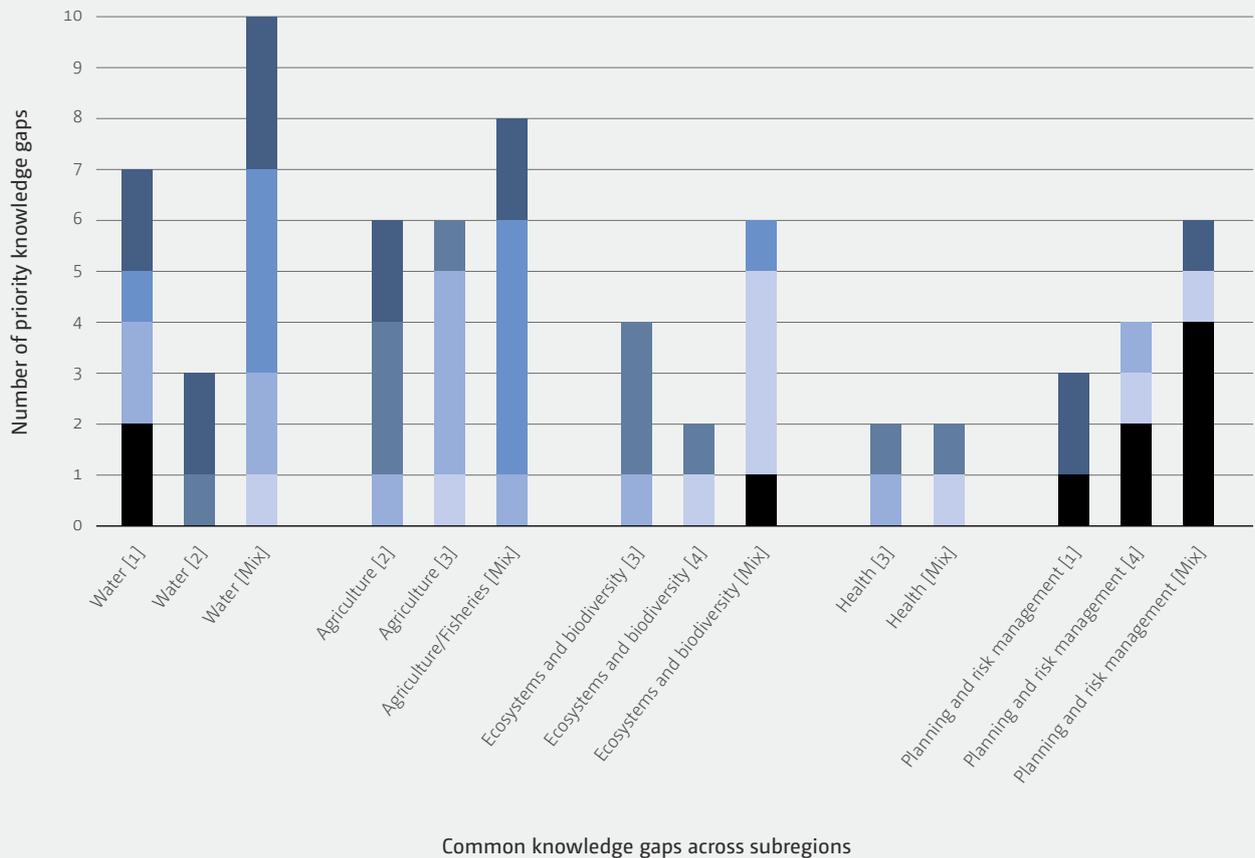
Photo by Nandhu Kumar.

Common priority gaps

For the purpose of this analysis, “commonality” refers to priority gaps that are identical or similar within a thematic area and a cluster. For example, lack of actionable knowledge [3] on the impacts of climate change on ecosystems and biodiversity is a common priority gap in both the Southern Africa and Hindu Kush Himalayan subregions (see Figure 2). Similar gaps might demand similar solutions. Thus, grouping gaps by commonality allows stakeholders to pinpoint synergies and design more efficient, cost-effective responses.

The agriculture thematic area has one of the highest concentrations of priority gaps. One quarter relate to a lack of access [2] to existing technologies or traditional and indigenous knowledge. Another six of the 20 agriculture priority gaps relate to a lack of actionable knowledge [3]. Common priority gaps in this cluster for the Southern Africa, Hindu Kush Himalayan, and West Asia/GCC subregions include a lack of actionable knowledge [3] on the sensitivity of agro-ecological zones, appropriate climate risk management, and climate-smart agriculture.

Figure 2 **Common priority knowledge gaps across subregions**



West Asia/GCC subregion
 Indian Ocean islands subregion
 North Africa subregion

Southern Africa subregion
 Hindu Kush Himalayan subregion
 Andean subregion

With regards to water, lack of access to existing knowledge [2] on water-related impacts (e.g. drought, landslide, debris flow, flooding, glacier lake outburst flood) have resulted in common water-related priority gaps in the Hindu Kush Himalayan and North Africa subregions.

Common priority gaps in relation to ecosystems and biodiversity are a lack of actionable knowledge [3] on climate change impacts. Both the Southern Africa and Hindu Kush Himalayan subregions are affected by these gaps.

Geo-specific priority knowledge gaps

While some priority gaps apply across multiple subregions, others are geo-specific. As shown in Figure 3, priority gaps related to energy were specific to the Indian Ocean islands and Southern Africa subregions. Priority gaps on desertification were only found in the North Africa subregion.

Certain clusters and knowledge users are also geo-specific. For example, priority gaps on energy are attributed to a lack of data [1] in the Indian Ocean islands subregion. In the Southern Africa subregion, data are available, but not actionable [3]. Similarly, the MSG for the Southern Africa subregion identified national energy planners as the knowledge users for these priority gaps, while in the Indian Ocean islands subregion it is policymakers and energy suppliers.

The geographical specificities of the priority gaps may become particularly relevant when allocating resources for climate change adaptation and formulating response actions in these subregions.

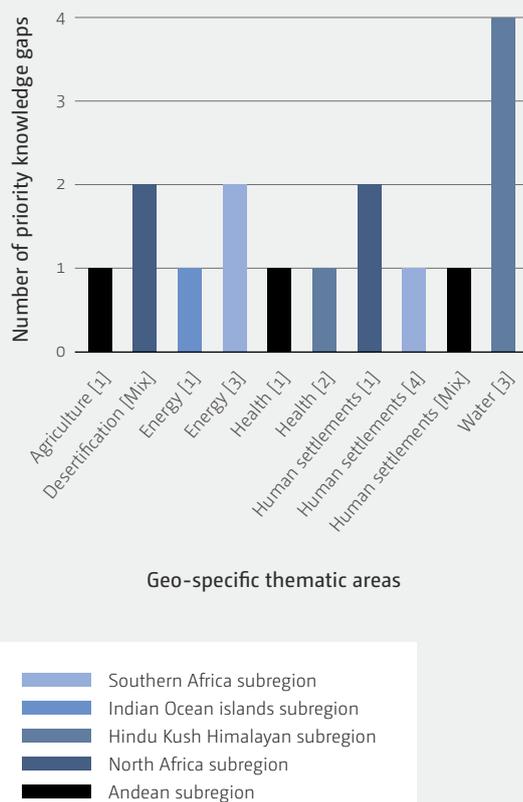
Interrelated priority knowledge gaps

Priority gaps are interrelated if closing one would contribute to closing others. Interrelated priority gaps are found across thematic areas and subregions. For example, an energy-related priority gap in Southern Africa and a health-related priority gap in the Andean subregion would both be served by increased knowledge of climate change impacts on water resources. Disseminating information on successful water resource management practices, especially in locally accessible and actionable format, would likely help to bridge the other thematic gaps.

Similarly, a lack of actionable knowledge [3] on climate change and human health affects both the Southern Africa and the Hindu Kush Himalayan subregions. The former described it as a “lack of knowledge on [the] relationship between climate change and human health, including the

Figure 3

Geo-specific knowledge gaps by thematic area



geographic distribution of human diseases”, while the latter noted a “lack of understanding of potential health co-benefits of climate change adaptation and mitigation measures in various sectors.”

A final example comes from the priority-setting workshop in the Hindu Kush Himalayan subregion. Four water-related priority gaps were identified under the same cluster of lack of access to actionable knowledge [3] (e.g. a repackaging of existing information is required). Improving information for any one will likely help to close the other two gaps.

Interrelated priority gaps could be low-hanging fruits for impactful and resource-efficient climate change adaptation actions.



Photo by Makalu, 2016.

Next steps

The pilot phase of the LAKI has enjoyed international recognition and support from partners as well as Parties to the Convention. Going forward, the initiative will build on the successful outcomes outlined above to facilitate knowledge-sharing, foster learning opportunities to bridge priority gaps, and channel knowledge outputs to support regional, national, and subnational adaptation planning and implementation.

The aim of the next phase of the LAKI will be two-fold. First, the initiative will aim to bridge priority gaps identified in the six subregions. This will be achieved by reaching out to research institutions and academia, including PROVIA, to close gaps resulting from a lack of data [1] or lack of tools and methods [4]. In parallel, the LAKI will catalyze collaborations between new and existing partners to close gaps related to a lack of access to existing [2] or actionable [3] knowledge.

For example, the University of Michigan School for Environment and Sustainability is leading a project to narrow two priority gaps in the Seychelles related

to the impacts of sea-level rise and storm surge on Seychelles' critical infrastructure. Similarly, coordination entities such as ICIMOD are currently working with partners to formulate action pledges and research proposals that target priority gaps in their subregions (see subregional profiles below for more information).

Second, the LAKI will be scaled up to reach new subregions, particularly those which include vulnerable developing countries such as the LDCs, SIDS, and African States.

The next phase of the LAKI has been firmly endorsed and mandated by Parties to the Convention and planning and resource mobilization is already underway. The LAKI is currently seeking partners to support the organization and implementation of programme activities that will narrow existing priority gaps and bring the LAKI to new subregions. Expressions of interest from expert organizations to address specific priority knowledge gaps are also welcome.

Andean subregion



Countries covered by the LAKI in the Andean subregion



I.

Andean subregion

Partnership with the International Center for Tropical Agriculture (CIAT)

Context

The Lima Adaptation Knowledge Initiative (LAKI) held its pilot priority-setting workshop from **24-26 September 2014 in Bogota, Colombia**. The workshop facilitated the assessment and prioritization of knowledge gaps hindering climate adaptation action in five countries in the Andean subregion with a **multi-stakeholder group (MSG)** of 17 experts. MSG members were affiliated with national organizations from Colombia, Ecuador, Peru and Chile, and with regional organizations engaged in research and actions on adaptation to climate change in the Andean subregion.

Scoping paper

A scoping paper summarizing existing literature was prepared in advance of the workshop with inputs from CIAT and MSG members. The paper identified 37 adaptation knowledge gaps in the subregion categorized into five thematic areas:

- > Scientific research and climate observation
- > Impacts on production sectors
- > Capacity-building and participation
- > Land use, planning and risk management
- > Public policies and institutions

Priority-setting workshop

Step 1

Refining the pool of knowledge gaps

The MSG refined the gaps identified in the scoping paper by adding, deleting, amending and/or merging gaps and categorizing them into thematic groups. By doing so, the experts defined an initial pool of 50 adaptation knowledge gaps.



Illustration copyright: <http://www.piktochart.com>

Step 2

Prioritizing the knowledge gaps

To prioritize the adaptation knowledge gaps, the MSG agreed on a set of evaluation criteria and their individual weights (see annex I). Over the course of two Delphi rounds,¹ the MSG refined the list of gaps to 13 priority gaps (see Table 1). According to the evaluation criteria, closing these gaps would yield the most benefits for the subregion.

The distribution of these gaps by thematic area is illustrated in Figure 4. The highest number are related to scientific research and climate observation, and impacts on production sectors. Regarding knowledge gap type, almost half were deemed to be the result of a mix of factors. Five were considered to result from a lack of data (cluster 1).

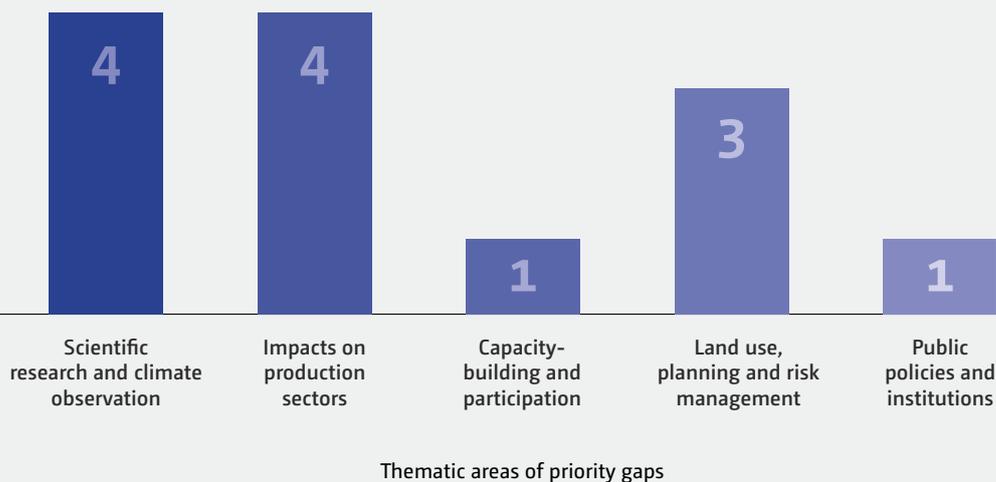
Step 3

Designing possible response actions

The MSG suggested potential response actions for some gaps and identified organizations that were well placed to undertake these actions. For example, for gap three on scientific research and climate observation, experts recommended strengthening research on the effects of climatic variables on vector and water-borne diseases associated with climate change. For gaps four and six related to impacts on production sectors, suggested responses were conducting a cost-benefit analysis of adaptation measures based on national, sectorial, and subnational adaptation plans and creating an online database to store national socio-economic information for key sectors. Lastly, the MSG considered that existing networks and structures working with territorial planning and land use associations in local communities could help to address gaps 12 and 13.

1. The Delphi method is a technique used to structure research discussions and generate a group response to specific questions. Experts' individual responses are collected via a questionnaire (the LAKI workshops used a scorecard) and shared anonymously with the larger group. The process is repeated in rounds in order to arrive at a group consensus.

Figure 4 **Number of priority gaps by thematic area for the Andean subregion**



Implementing actions to close knowledge gaps

The outcomes of the priority-setting workshop for the Andean subregion, including the full workshop report, have been disseminated through the Adaptation knowledge portal² and regional and global events.

Science-policy-practice dialogues have also been convened to discuss response actions to close the knowledge gaps. These include events organized by GAN during the 2015 GAN meeting in Latin America³ and during Adaptation Knowledge Day 2015 in Bonn, Germany.⁴

2. see: www4.unfccc.int/sites/NWP/Pages/LAKI-South-America.aspx

3. see: www.ctc-n.org/sites/default/files/GAN_Workshop_Report_Final.pdf

4. see: www.asiapacificadapt.net/sites/default/files/event/attach/AKD6.pdf

Table 1 | Priority knowledge gaps for the Andean subregion

No.	Thematic area	Gap description	Cluster	Knowledge user
1	Scientific research and climate observation	Gaps in integrated research on the effects of climate change on ecosystem services, and their relationship with the quality of life of populations	Lack of data, lack of actionable knowledge (e.g., in need of repackaging existing knowledge), lack of tools/methods [Mix]	Authorities and ministries for water and irrigation, human consumption, enterprises for drinking water and hydro-energy, ministries and agencies for planning, authorities for the environment, carbon markets, authorities for the environment, plant breeders
2	Land use, planning and risk management	Scarcity of mechanisms for including adaptation in current planning tools	Lack of tools/methods [4]	National government (different parts of the government and different ministries), local governments, public institutions, academia, civil society (including non-governmental organizations), Andean regional entities
3	Scientific research and climate observation	Lack of data and information on health and associated variables, and on the impact of climate change on health in the Andean subregion	Lack of data [1]	National and subnational governments, universities, non-governmental organizations
4	Impacts on production sectors	Lack of economic information and cost-benefit analyses needs for adaptation	Lack of data, lack of tools/methods [Mix]	National and subnational governments, universities, non-governmental organizations
5	Land use, planning and risk management	Gaps in methodologies for promoting processes that facilitate multi-sectoral adaptation	Lack of actionable knowledge (e.g., in need of repackaging existing knowledge), lack of tools/methods [Mix]	National and local governments
6	Impacts on production sectors	Gaps in socio-economic information for evaluating the impact of climate change	Lack of data, lack of access [Mix]	National government (different parts of the government and different ministries), local governments, public institutions, academia, civil society (including non-governmental organizations)
7	Impacts on production sectors	Scarcity of sectoral analyses on the costs of climate change and on the investment needs for adaptation	Lack of data [1]	National and local governments

No.	Thematic area	Gap description	Cluster	Knowledge user
8	Land use, planning and risk management	Gaps in information on tools for territorial planning and land use	Lack of data, lack of tools/methods [Mix]	National and local governments, academia: universities and relevant research centres, private sector: trade and associations, civil society, including non-governmental organizations, organizations for development cooperation
9	Scientific research and climate observation	Gaps in the analyses of social variables, and of supply and demand for water, associated with different climate change scenarios	Lack of data [1]	National and local governments
10	Impacts on production sectors	Scarcity of information and of analyses relating to the impact of climate change on agricultural and livestock production systems	Lack of data [1]	Regional governments, national government (different parts of the government and different ministries), local governments, public institutions, academia, civil society, including non-governmental organizations
11	Scientific research and climate observation	Gaps in research and the exchange of knowledge on techniques, and in the optimization of technologies for managing hydric resources and adapting to the effects of climate change	Lack of data [1]	Authorities and ministries for water and irrigation, human consumption, enterprises for drinking water and hydro-energy, ministries and agencies for planning, authorities for the environment, carbon markets, plant breeders
12	Capacity-building and participation	Absence of mechanisms for the dissemination of knowledge on adaptation to local communities	Lack of access, lack of tools/methods [Mix]	Local governments, academia, universities, private sector; farmer associations, civil society, including non-governmental organizations
13	Public policies and institutions	Lack of tools to enhance systematization of existing experiences on adaptation	Lack of tools/methods [4]	n/a

For more information, see the full workshop report available via the Adaptation knowledge portal at <http://www4.unfccc.int/sites/nwp/Pages/Home.aspx>

West Asia/ Gulf Cooperation Council subregion

“The importance of sharing knowledge and information regarding climate change adaptation cannot be emphasized enough; regional networks that allow organizations to collaborate and share their experiences and lessons deserve our full attention and efforts. AGEDI is proud to have contributed to the LAKI process as the subregional coordination entity for the GCC and will continue working towards actively closing knowledge gaps.”

Ahmed Baharoon, Acting Director of the Abu Dhabi Global Environmental Data Initiative (AGEDI)

Countries covered by the LAKI in the West Asia/GCC subregion



II.

West Asia/GCC subregion

Partnership with Abu Dhabi Global Environmental Data Initiative (AGEDI)

Context

The second LAKI priority-setting workshop was held from **15-17 June 2015** in **Abu Dhabi, United Arab Emirates**. The workshop focused on adaptation knowledge gaps in the West Asia/Gulf Cooperation Council subregion which encompasses six countries.

The subregional MSG was composed of 18 experts from the private and public sector, civil society organizations and, most prominently, regional research institutions and academia.

Scoping paper

The scoping paper for the subregion identified 24 adaptation knowledge gaps through a literature review. The gaps fell into six thematic areas:

- > Water resources
- > Ecosystems (terrestrial and marine)
- > Coastal zones
- > Public health
- > Food security
- > Cross-cutting

Priority-setting workshop

Step 1

Refining the pool of knowledge gaps

The MSG reviewed the knowledge gaps identified in the scoping paper, adding, deleting, amending, and/or merging gaps and categorizing them in thematic groups. A total of 72 adaptation knowledge gaps were identified for consideration.



Illustration copyright: <http://www.piktochart.com>

Step 2

Prioritizing the knowledge gaps

The MSG defined seven evaluation criteria and their relative weights (see annex I). Over the course of two Delphi rounds, MSG members used these criteria to narrow the 72 gaps down to 10 priority gaps (see Table 2).

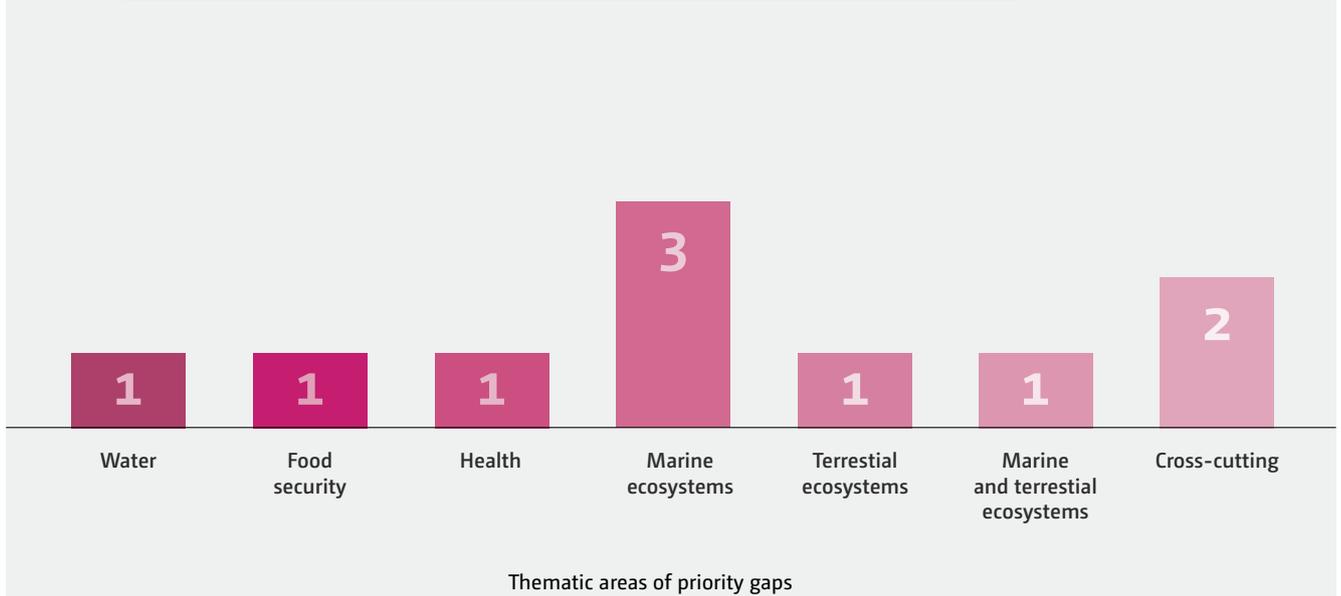
These gaps were fairly evenly distributed across seven thematic areas, with a slight concentration in the area of marine ecosystems (see Figure 5). The underlying cause of the gaps was also evenly mixed across the four cluster types, with most relating to two or more causes.

Step 3

Designing possible response actions

During the third step of the workshop, the MSG proposed potential response actions and noted implementing organizations that were well placed to carry these out. For gaps four and six related to insufficient information and technical capacity to address climate change impacts on marine ecosystems, the MSG suggested creating a habitat map of ecosystem services and a joint programme for capacity building. The MSG also suggested that gap one on water resources and gap eight on human health would benefit from improved data sources including technical and statistical reports as well as policy briefs.

Figure 5 Number of priority gaps by thematic area for the West Asia/GCC subregion



Implementing actions to close knowledge gaps

The outcomes of the priority-setting workshop for the West Asia/GCC subregion, including the full workshop report, were disseminated through the Adaptation knowledge portal.⁵

The results were complemented by a comprehensive (12 sub-projects) analysis of the impacts climate change is having and will have on the Arabian Peninsula⁶ released by AGEDI. The analysis was the product of AGEDI's Local, National, Regional Climate

Change Programme (2013-2017). AGEDI has also been active in a number of national and regional initiatives that are relevant to closing LAKI knowledge gaps. These include contributing to the United Arab Emirates (UAE) Climate Change Adaptation Strategy, establishing national and regional blue carbon technical working groups, and supporting the Second Global Adaptation Network (GAN) Forum that was held in Abu Dhabi on 20-21 March 2018.

5. see: www4.unfccc.int/sites/NWP/Pages/LAKI-Asia.aspx

6. see: <https://www.ccr-group.org/cc-inspectors>

Table 2 | Priority knowledge gaps for the West Asia/GCC subregion

No.	Thematic area	Gap description	Cluster	Knowledge user
1	Water	Limited availability and access to observed data on quantity and quality of conventional (groundwater reserves, surface water, shared transboundary flows, recharge levels) and non-conventional (treated wastewater, desalinated water) water resources	Lack of data, lack of access [Mix]	Decision makers, planners, media, researchers, civil society including non-governmental organizations. Ministries of environment, water, agriculture and energy
2	Cross-cutting	Limited availability and lack of access to scenario data at various spatial scales for projected climatic variables, including temperature, precipitation, wind, evapotranspiration, drought, flash floods, sea level, extreme events, etc.	Lack of data, lack of access [Mix]	Climate modelers, researchers, climate change stakeholders
3	Terrestrial ecosystems	Fragmented baseline data (biological, ecological and climate) and lack of standardized methodologies for consolidating information on terrestrial ecosystems at the subregional level	Lack of data, lack of access [Mix]	National implementers, environmental agencies, research institutes, public authorities, academia
4	Marine ecosystems	Incomprehensive data and information as well as lack of integrated approaches related to climate change impacts on coastal and marine ecosystems' goods and services	Lack of data, lack of actionable knowledge (e.g., in need of repackaging existing knowledge), lack of tools/methods [Mix]	Environmental hubs in the region, decision makers
5	Marine ecosystems	Inadequate knowledge and awareness on coastal defense and protection services provided by coastal and marine ecosystems and their response to a changing climate	Lack of data, lack of access [Mix]	Decision makers, academia, civil society including non-governmental organizations
6	Marine ecosystems	Insufficient technical capacity for monitoring, assessing and projecting impacts of climate change in the marine ecosystems	Lack of access, lack of actionable knowledge (e.g., in need of repackaging existing knowledge), lack of tools/methods [Mix]	Municipalities, planners, policymakers

No.	Thematic area	Gap description	Cluster	Knowledge user
7	Food security	Limited knowledge of climate smart agricultural practices	Lack of actionable knowledge (e.g., in need of repackaging existing knowledge) [3]	Consumers and producers, farmers, decision makers, ministries of agriculture
8	Health	Lack of information and knowledge on the direct and indirect impacts of climate change on human health	Lack of data, lack of actionable knowledge (e.g., in need of repackaging existing knowledge) [Mix]	Ministries of health, faculties of medicines, syndicates of pharmaceuticals, World Health Organization, health agencies
9	Cross-cutting	Limited knowledge on developing adaptive measures and projects	Lack of tools and methods [4]	Local communities, civil society including non-governmental organizations
10	Marine and terrestrial ecosystems	Lack of knowledge of the costs of climate change impacts and adaptation investment opportunities for sustainable development in the marine and terrestrial ecosystems	Lack of tools and methods [4]	Gulf Cooperation Council Secretariat General Ministries

For more information, see the full workshop report available via the Adaptation knowledge portal at <http://www4.unfccc.int/sites/nwp/Pages/Home.aspx>

Southern Africa subregion



Countries covered by the LAKI in the Southern Africa subregion



III.

Southern Africa subregion

Partnership with SouthSouthNorth (SSN)

Context

The third priority-setting workshop covering eight countries in the Southern Africa subregion was held from **16-18 November 2015** in **Johannesburg, South Africa**. The MSG consisted of 10 core experts with representatives from non-governmental organizations, the private and public sector and research institutions working on crosscutting as well as sector-specific adaptation challenges in the subregion.

Scoping paper

The scoping paper for the Southern Africa subregion included 52 adaptation knowledge gaps derived from a literature review of published information on:

- > Agriculture and food security
- > Forestry and biodiversity
- > Water resources
- > Fisheries
- > Energy
- > Meteorological data
- > Human settlements and infrastructure
- > Health

Priority-setting workshop

Step 1

Refining the pool of knowledge gaps

The MSG refined the gaps identified in the scoping paper by adding, deleting, amending and/or merging gaps and categorizing them into thematic groups. The initial pool of knowledge gaps was refined from 52 to 45 for the prioritization exercise.



Illustration copyright: <http://www.piktochart.com>

Step 2

Prioritizing the knowledge gaps

The MSG agreed on the criteria and aggregated weights for prioritizing the adaptation knowledge gaps (see annex I). Subsequently, these criteria were used to analyse the 45 knowledge gaps through two Delphi rounds. The exercise produced 16 priority gaps which the MSG determined would yield the most tangible and sustainable benefits if closed (see Table 3).

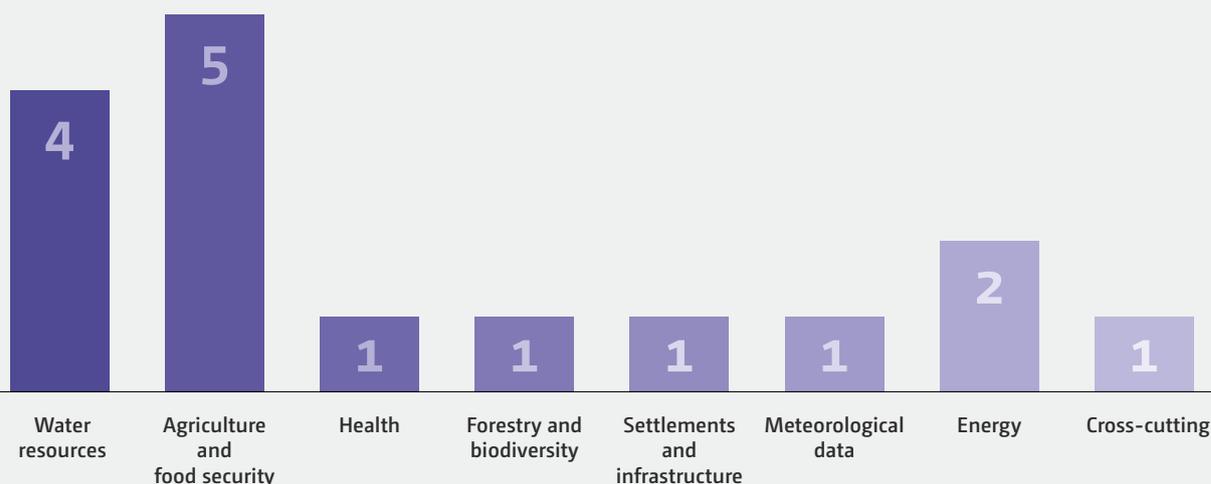
The distribution of these gaps by thematic area is illustrated in Figure 6. The highest number of priority knowledge gaps for the Southern Africa subregion are related to agriculture and food security, followed by water resources. Half were the result of a lack of actionable knowledge (cluster 3).

Step 3

Designing possible response actions

The third and final step of the workshop centred on potential response actions and organizations best placed to drive them (see Table 3). For example, the MSG suggested that vulnerability maps would help to close the first gap on water resources. They also noted that priority gap three on agriculture/food security could be addressed by integrating climate-sensitivity into agro-ecological zoning guidelines. Similarly, gaps 11 and 12 relating to meteorological information and human settlements, respectively, could be narrowed by providing trainings on how to integrate climate science into decision-making processes and spatial planning.

Figure 6 **Number of priority gaps by thematic area for the Southern Africa subregion**



Thematic areas of priority gaps

Implementing actions to close knowledge gaps

The outcomes of the priority-setting workshop, including the full workshop report, were disseminated through the Adaptation knowledge portal.⁷ They were also presented at a side event in Paris with scientists, policymakers and practitioners during the 21st Session of the Conference of the Parties to the UNFCCC in December 2015. The event featured expert panellists from the Climate

Development Knowledge Network (CDKN), the Adaptation Committee, the International Centre for Climate Change and Development (ICCCAD), the Environmental Protection Agency of Ghana, UN Environment-DEPI, and the UNFCCC Secretariat. Speakers discussed strategies for closing the priority gaps in the subregion.⁸

7. see: <http://www4.unfccc.int/sites/NWP/Pages/LAKI-Africa.aspx>
8. see https://www.afdb.org/fileadmin/uploads/afdb/Documents/Events/COP21/Abstracts/03_Dec_2015_-_Lima_Adaptation_Knowledge_Initiative.pdf

Table 3 | Priority knowledge gaps for the Southern Africa subregion

No.	Thematic area	Gap description	Cluster	Knowledge user
1	Water resources	Lack of knowledge on the vulnerability of and impacts of climate change on river basins and watershed systems	Lack of data [1]	River basin authority, department responsible for water resources management
2	Cross-cutting	Lack of information on available adaptation options for agriculture	Lack of actionable knowledge (e.g., in need of repackaging existing knowledge) [3]	Farmers and extension officers
3	Agriculture/ Food security	Lack of knowledge on the sensitivity of agro-ecological zones across the subregion to historic and future climate change	Lack of actionable knowledge (e.g., need to repackage existing knowledge) [3]	National planners, land managers, small holder farmers
4	Agriculture/ Food security	Lack of knowledge in implementing appropriate climate risk management strategies for agriculture	Lack of actionable knowledge (e.g., in need of repackaging existing knowledge) [3]	National committee for disaster management; extension workers
5	Water resources	Lack of knowledge on the vulnerability of and impacts of climate change on river basins and watershed systems	Lack of data [1]	National and regional water planners, (River basin authority, department responsible for water resources management)
6	Agriculture/ Food security	Lack of usable knowledge products on short and long-term meteorological data and seasonal forecasting for agriculture planning	Lack of actionable knowledge (e.g., in need of repackaging existing knowledge) [3]	Agricultural extension department, extension workers and farmers
7	Water resources	Lack of clear information on the relative contribution of natural variability, climate change and other human impacts on trends in the hydrological cycles	Lack of data, Lack of actionable knowledge (e.g., in need of repackaging existing knowledge) [Mix]	Water resource planners, climate change department, meteorological department
8	Agriculture/ Food security	Limited knowledge on technologies available for adaptation in the agricultural sector	Lack of access [2]	Small-scale farmers, extension workers, technology providers, financiers, and planners

No.	Thematic area	Gap description	Cluster	Knowledge user
9	Health	Lack of knowledge on relationship between climate change and human health including the geographical distribution of human diseases	Lack of actionable knowledge (e.g., in need of repackaging existing knowledge) [3]	Ministry of Health, public health department
10	Energy	Insufficient knowledge on the climate change impacts on hydropower generation	Lack of actionable knowledge (e.g., in need of repackaging existing knowledge) [3]	National level energy planners
11	Meteorological data/ information	Lack of knowledge on effective integration of climate model results into decision-making	Lack of tools/methods [4]	National level planners
12	Human settlements	Lack of knowledge on how to integrate climate science into spatial planning	Lack of tools/methods [4]	City planners, champions and higher education students
13	Energy	Lack of integrated and sustainable approach to sustainable energy planning for households	Lack of actionable knowledge (e.g., in need of repackaging existing knowledge) [3]	National energy planners
14	Water resources	Inadequate access to long-term meteorological data that limits rainfall-runoff modelling for the rivers and floodplains	Lack of access, lack of actionable knowledge (e.g., in need of repackaging existing knowledge) [Mix]	National water resource planners, researchers
15	Agriculture/ Food security	Lack of knowledge on the sensitivity of agro-ecological zones across the subregion to historic and future climate change	Lack of data, lack of actionable knowledge (e.g., in need of repackaging existing knowledge) [Mix]	Ministry of Agriculture, crop production departments, national level extension planners
16	Forestry and Biodiversity	Lack of policy relevant information on the impacts of climate change on forestry, biodiversity and structure, functions and provisions for ecosystems	Lack of actionable knowledge (e.g., in need of repackaging existing knowledge) [3]	Ministry responsible for forestry and biodiversity

For more information, see the full workshop report available via the Adaptation knowledge portal at <http://www4.unfccc.int/sites/nwp/Pages/Home.aspx>

Hindu Kush Himalayan subregion



Countries covered by the LAKI in the Hindu Kush Himalayan subregion



IV.

Hindu Kush Himalayan subregion

Partnership with the International Centre for Integrated Mountain Development (ICIMOD)

Context

The adaptation knowledge gaps of the Hindu Kush Himalayan subregion were analyzed during the fourth LAKI priority-setting workshop from 20-22 October 2016 in Colombo, Sri Lanka. The twelve-member MSG was composed of experts affiliated with government agencies, academia, and civil society organizations. In addition, a support group of three professionals specializing in adaptation challenges related to forest and biodiversity, health, and agriculture provided inputs during the workshop.

Scoping paper

The scoping paper for the Hindu Kush Himalayan subregion included an initial list of 64 adaptation knowledge gaps categorized into the following thematic areas:

- > Agriculture
- > Water resources
- > Health
- > Forest and biodiversity
- > Cross-cutting

Priority-setting workshop

Step 1

Refining the pool of knowledge gaps

Collectively, the MSG reviewed, refined and amended the gaps identified in the scoping paper to produce an updated pool of 46 adaptation knowledge gaps.



Illustration copyright: <http://www.piktochart.com>

Step 2

Prioritizing the knowledge gaps

The MSG agreed on four criteria and their relative weights for prioritizing the adaptation knowledge gaps (see annex I). Over the course of two Delphi rounds, MSG members used these criteria to prioritize the 46 adaptation knowledge gaps identified in step 1, resulting in 16 priority gaps (see Table 4).

The distribution of priority gaps by thematic area is shown in Figure 7. Several priority gaps were included for each of the four areas of water, agriculture, forest and biodiversity, and health. The highest number of priority gaps (five) are related to water. Over half of the priority gaps were determined to be the result of a lack of actionable knowledge (cluster 3), while one third related to a lack of access to existing data (cluster 2). In contrast to other subregions, several of the priority gaps in the Hindu Kush Himalayan subregion are highly geo-specific and related to local and indigenous knowledge.

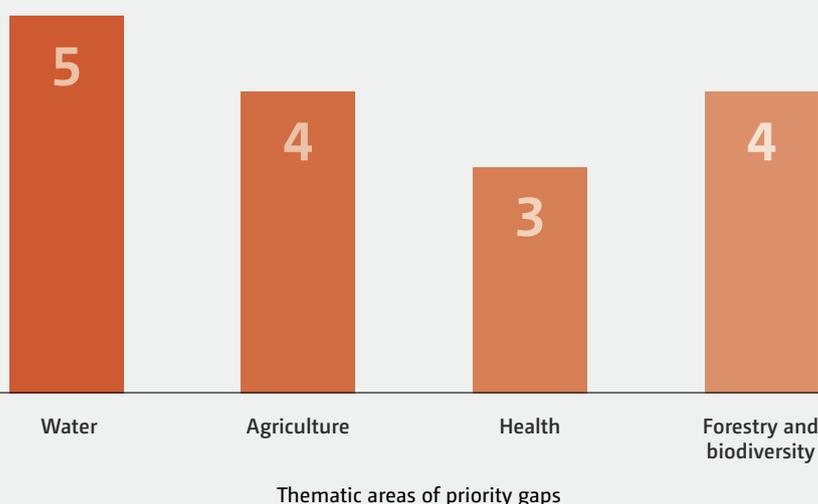
Step 3

Designing possible response actions

For the third step of the workshop, the MSG members were invited to provide potential response actions and share expressions of interest to implement these actions, or recommend other organizations well placed to do so. Regarding priority gap one, for example, the MSG recommended pre-monsoon workshops on weather and seasonal forecasting be organized in Myanmar for decision makers, planners, and civil society. In Pakistan, text alerts and announcements for farmers were recommended as a helpful response action. The full list of response actions for each priority gap can be found in the workshop report.

Additionally, the Adaptation learning highway and the Educational Partnerships for Innovation in Communities Network (EPIC-N) Model were presented to illustrate innovative approaches to closing knowledge gaps during the workshop.

Figure 7 Number of priority gaps by thematic area for the Hindu Kush Himalayan subregion



Implementing actions to close knowledge gaps

The outcomes of the Hindu Kush Himalayan priority-setting workshop and the full workshop report were disseminated through the Adaptation knowledge portal⁹ and by the subregional coordination entity ICIMOD.¹⁰ They were also shared with national delegates and stakeholders from around the world during a joint side event at the Bonn Climate Change Conference in May 2017. The event was organized by the UNFCCC secretariat, UN Environment and ICIMOD to discuss progress of the LAKI in the Hindu Kush Himalayan subregion and collect further expressions of interest to close priority knowledge gaps.¹¹

ICIMOD has taken action to close priority gap three by improving access to awareness-raising products and early warning systems for multiple hazards and is working in partnership with UN Environment, the UNFCCC secretariat, and several regional partners to

catalyze action around the remaining gaps.¹² In December 2017, a satellite event was convened in Kathmandu during the International Conference on Resilient Hindu Kush Himalaya to examine opportunities for repackaging scientific research into usable formats for adaptation practitioners. Following discussions on available technologies for improving water and agriculture resilience, participants developed proposals to close related priority gaps in the subregion. These proposals will be converted into action pledges for the Nairobi work programme's Adaptation knowledge portal.

In March 2018, a round-table meeting was organized with the Global Development Network in New Delhi as a pre-event to the 18th Global Development Conference. The meeting discussed the establishment of a regional interdisciplinary research consortium to close agriculture priority gaps. The proposed consortium would pool intellectual and institutional resources to scale-up policy.

9. see: www4.unfccc.int/sites/NWP/Pages/LAKI-Asia.aspx

10. see: www.icimod.org/?q=24782

11. see: www4.unfccc.int/sites/NWP/News/Pages/LAKI-side-event-SB46.aspx

12. See: <http://www.icimod.org/?q=30221>

Table 4 | Priority knowledge gaps for the Hindu Kush Himalayan subregion

No.	Thematic area	Gap description	Cluster	Knowledge user
1	Agriculture	Limited access to adequate, locally usable knowledge and information on weather and seasonal forecasting to assist farm production operations	Lack of access [2]	Extension workers, national hydro-met services, agriculture experts
2	Water	Weak dissemination of evidence and successful water management practices, adaptation technologies, and water allocation and management during periods of scarcity and abundance	Lack of actionable knowledge (e.g., in need of repackaging existing knowledge) [3]	Water resource planners, policymakers, communities project managers
3	Water	Lack of access to awareness-raising products and early warning systems for multiple hazards (drought, landslide, debris flow, flooding, glacier lake outburst flood in the Himalayas and downstream communities)	Lack of access [2]	Early warning system designers, town and provincial planners/ watershed managers, communities
4	Agriculture	Inadequate information and knowledge on adaptation options and technologies suitable to address context-specific climate extremes, impacts and risks for agriculture and the net effect of climate change at the local level	Lack of actionable knowledge (e.g., in need of repackaging existing knowledge) [3]	Farmers, extension agencies district agriculture officers and experts, technology users, policymakers, local non-governmental organizations
5	Health	Limited access to weather and seasonal forecasting data for public health preparedness (heat waves, cold waves, thunderstorms, disease epidemics)	Lack of access, Lack of actionable knowledge (e.g., in need of repackaging existing knowledge) [Mix]	Health professionals and public
6	Agriculture	Limited access to traditional knowledge and indigenous knowledge on agricultural adaptation	Lack of access [2]	Village elders, farming families, researchers, policymakers, agricultural extension workers, civil society organizations
7	Water	Poor translations of climate data and models into understandable formats	Lack of actionable knowledge (e.g., in need of repackaging existing knowledge) [3]	National–subnational planning departments, project managers, community leaders and members
8	Health	Lack of awareness/sensitization among public and media about climate change health impacts and adaptation/response measures	Lack of access [2]	Public

No.	Thematic area	Gap description	Cluster	Knowledge user
9	Agriculture	Limited understanding of traditional knowledge and indigenous knowledge on agricultural adaptation	Lack of access [2]	Climate negotiators, policymakers
10	Water	Knowledge on how climate change is impacting on water source/usage/availability/quality (including sanitation/water treatment/water inputs for energy/springs and natural wells, groundwater, spring water and glaciers)	Lack of actionable knowledge (e.g., in need of repackaging existing knowledge) [3]	Watershed planners, settlement planners/energy planners, community leaders and civil society project managers
11	Forestry and biodiversity	Knowledge gap on methodologies and tools to quantify the impact of climate change on ecosystem services	Lack of tools and methods [4]	Researchers, academics
12	Health	Lack of understanding/evidence of potential health co-benefits of climate change adaptation and mitigation measures in various sectors	Lack of actionable knowledge (e.g., in need of repackaging existing knowledge) [3]	Policymakers
13	Forest and biodiversity	Lack of adequate knowledge on the effects of climate change on biodiversity	Lack of actionable knowledge (e.g., in need of repackaging existing knowledge) [3]	Researchers, academics, policymakers, community members
14	Forest and biodiversity	Need for repackaging the baseline data on the effects of climate change for forests and biodiversity for different target groups	Lack of actionable knowledge (e.g., in need of repackaging existing knowledge) [3]	Researchers, academics, practitioners
15	Forest and biodiversity	Insufficient information on local indigenous knowledge on forest management	Lack of actionable knowledge (e.g., in need of repackaging existing knowledge) [3]	Researchers, academics, practitioners, community members
16	Water	Insufficient climate change communication on impacts on water systems/availability to determine climate change impacts and inform decision-making in designing water resource plans and implementation	Lack of actionable knowledge (e.g., in need of repackaging existing knowledge) [3]	Communities, subnational government, non-technical stakeholders

For more information, see the full workshop report available via the Adaptation knowledge portal at <http://www4.unfccc.int/sites/nwp/Pages/Home.aspx>

Indian Ocean islands subregion



Countries covered by the LAKI in the Indian Ocean islands subregion

Comoros	
Madagascar	
The Maldives	
Mauritius	
The Seychelles	
Sri Lanka	

V.

Indian Ocean islands subregion

Partnership with the International Water Management Institute (IWMI)

Context

The priority gaps for the Indian Ocean islands subregion were defined during the fourth LAKI priority-setting workshop convened from **20-22 October 2016 in Colombo, Sri Lanka**. The three-day workshop facilitated constructive discussions among a MSG of 11 core experts from the private and public sector, non-governmental organizations and research institutions.

Scoping paper

The scoping paper reviewed and summarized existing literature on adaptation for the subregion. Included were 31 knowledge gaps under the following thematic areas:

- > Water resources
- > Agriculture (crops, fisheries, and livestock production)
- > Coastal zones and marine ecosystems
- > Health
- > Energy
- > Infrastructure and human settlements

Priority-setting workshop

Step 1

Refining the pool of knowledge gaps

The MSG refined the gaps identified in the scoping paper by adding, deleting, merging and/or categorizing knowledge gaps into thematic groups, resulting in 38 adaptation knowledge gaps for the prioritization exercise.



Illustration copyright: <http://www.piktochart.com>

Step 2

Prioritizing the knowledge gaps

The MSG agreed on four criteria for the prioritization of the adaptation knowledge gaps (see annex I). These criteria were ranked individually by each MSG member and the results were aggregated to determine the different weight for each criterion.

Discussions revealed that the prioritization results were skewed toward large islands and did not adequately reflect the needs of some of the smaller ones. Thus, the prioritization was done for a cluster of large Indian Ocean islands (Madagascar, Sri Lanka) resulting in six priority gaps (see Table 5) and a cluster of small Indian Ocean islands (Comoros, the Maldives, Mauritius and the Seychelles) resulting in six priority gaps (see Table 5).

Figure 8 summarizes the distribution of priority gaps by thematic area for the large islands and small islands, respectively. For large islands, improving agricultural resilience to climate change was the main focus. For the small islands, which are less dependent on agriculture, protecting the integrity

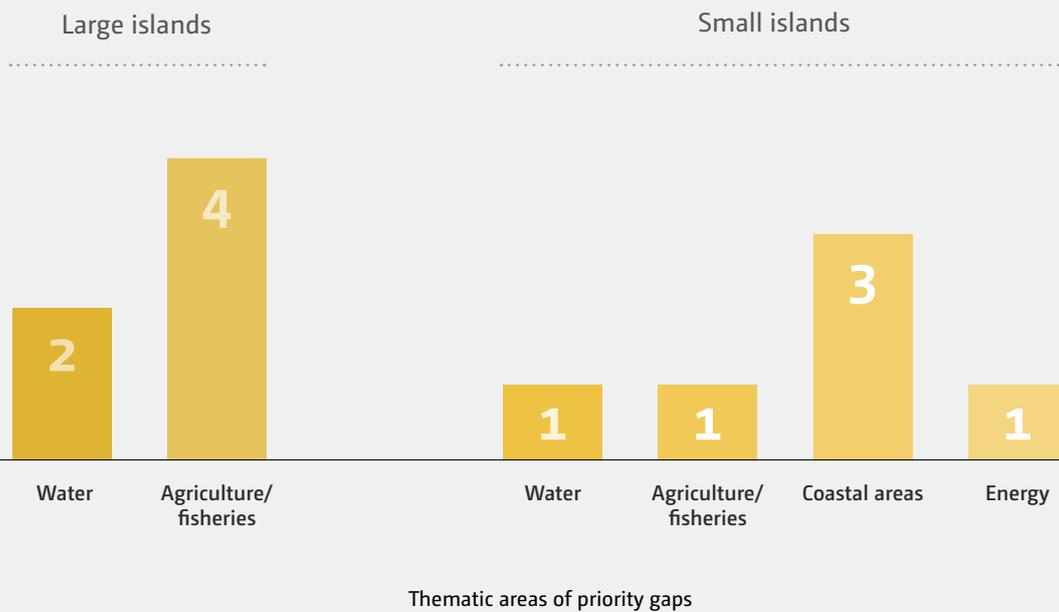
of coastal areas was the primary concern. Most of the priority gaps for both the large and small islands related to a mix of factors, especially a lack of data (cluster 1) and lack of access to existing data (cluster 2).

Step 3

Designing possible response actions

As a final step, the MSG suggested potential response actions and organizations well placed to implement them. For example, to address priority gap number one for the large islands, the MSG recommended capacity building workshops and developing context-specific reports capturing best practices for local officers/technicians specializing in land and water. For the chief gap facing small islands, the MSG recommended developing guidance for local and national policymakers on how to improve the climate resilience of coastlines based on available research on erosion. More recommendations are available in the workshop report.

Figure 8 **Number of priority gaps by thematic area for the Indian Ocean islands subregion**



Implementing actions to close knowledge gaps

The outcomes of the priority-setting workshop and the full workshop report were disseminated through the Adaptation knowledge portal¹³ and by the subregional coordination entity International Water Management Institute.¹⁴

Already, researchers at the University of Michigan, USA have responded with a capstone project titled *Improving climate resilience in the Seychelles: Evaluating the impacts of sea-level rise and storm*

surges on Seychelles' critical infrastructure. The project targets the first and third priority gaps identified for the small islands (see Table 5) and will run through early 2019.

The University of Michigan team is working with local actors in the Seychelles as well as international organizations to investigate and narrow these gaps through science-policy-practice collaboration.

13. see: www4.unfccc.int/sites/NWP/Pages/LAKI-Asia.aspx

14. see: www.iwmi.cgiar.org/2016/10/from-the-hindu-kush-to-the-indian-ocean

Table 5 | Priority knowledge gaps for the Indian Ocean islands subregion

Large islands

No.	Thematic area	Gap description	Cluster	Knowledge user
1	Agriculture/ fisheries	Insufficient information on water-conserving irrigation practices and other water management techniques	Lack of data, lack of access [Mix]	Agricultural planners, extension officials, small-scale farmers (gender), water/irrigation management practitioners
2	Agriculture/ fisheries	Insufficient information on crop and agricultural diversification	Lack of data, lack of access [Mix]	Farmers, extension people, planners
3	Agriculture/ fisheries	Insufficient information on climate-smart crop varieties	Lack of data, lack of access, lack of actionable knowledge (e.g., in need of repackaging existing knowledge) [Mix]	Policymakers (local planners, government officials), farmers and agro-based industries, non-governmental organizations
4	Water	Insufficient information on climatic parameters at the sub-basin/ catchment/ subnational level	Lack of data, lack of access [Mix]	Policymakers (local planners, government officials)
5	Water	Insufficient information on water storage capacity and status (e.g. reservoirs, tanks)	Lack of data [1]	Policymakers (local planners, government officials), non-governmental organizations
6	Agriculture/ fisheries	Insufficient information on cropping calendars that precisely integrate the impacts of climate change	Lack of data, lack of access, lack of actionable knowledge (e.g., in need of repackaging existing knowledge) [Mix]	Policymakers (local planners, government officials), farmers and agro-based industries, non-governmental organizations

For more information, see the full workshop report available via the Adaptation knowledge portal at <http://www4.unfccc.int/sites/nwp/Pages/Home.aspx>

Table 5 | Priority knowledge gaps for the Indian Ocean islands subregion

Small islands

No.	Thematic area	Gap description	Cluster	Knowledge user
1	Coastal areas	Insufficient information on the impacts of storm surges and other extreme events on coastal areas, including erosion and impacts on infrastructure, and drinking water supply	Lack of data, lack of access [Mix]	Policymakers (local planners, government officials) from various ministries/ departments, tourism industry, non-governmental organizations, coastal communities
2	Agriculture/ fisheries	Insufficient knowledge on how climate change affects coastal/marine fish migration	Lack of data, lack of access [Mix]	Fisheries industries, fisheries sector officials
3	Coastal areas	Insufficient information on the impacts of sea level rise on coastal areas, including erosion and impacts on infrastructure, and drinking water supply	Lack of data, lack of access [Mix]	Policymakers (local planners, government officials) from various ministries/ departments, tourism industry, non-governmental organizations, coastal communities
4	Coastal areas	Insufficient information on the impacts of climate change on coral reefs, including coral bleaching	Lack of data, lack of access, lack of actionable knowledge (e.g., in need of repackaging existing knowledge) [Mix]	Policymakers (local planners, government officials), environmental non-governmental organizations, fishers, fisheries associations
5	Water	Insufficient information on climatic parameters at the sub-basin/ catchment/ subnational level	Lack of data, lack of access [Mix]	Policymakers (local planners, government officials)
6	Energy	Insufficient information on the impacts of climate change on energy demand	Lack of data [1]	Energy suppliers, policymakers/government, non-governmental organizations

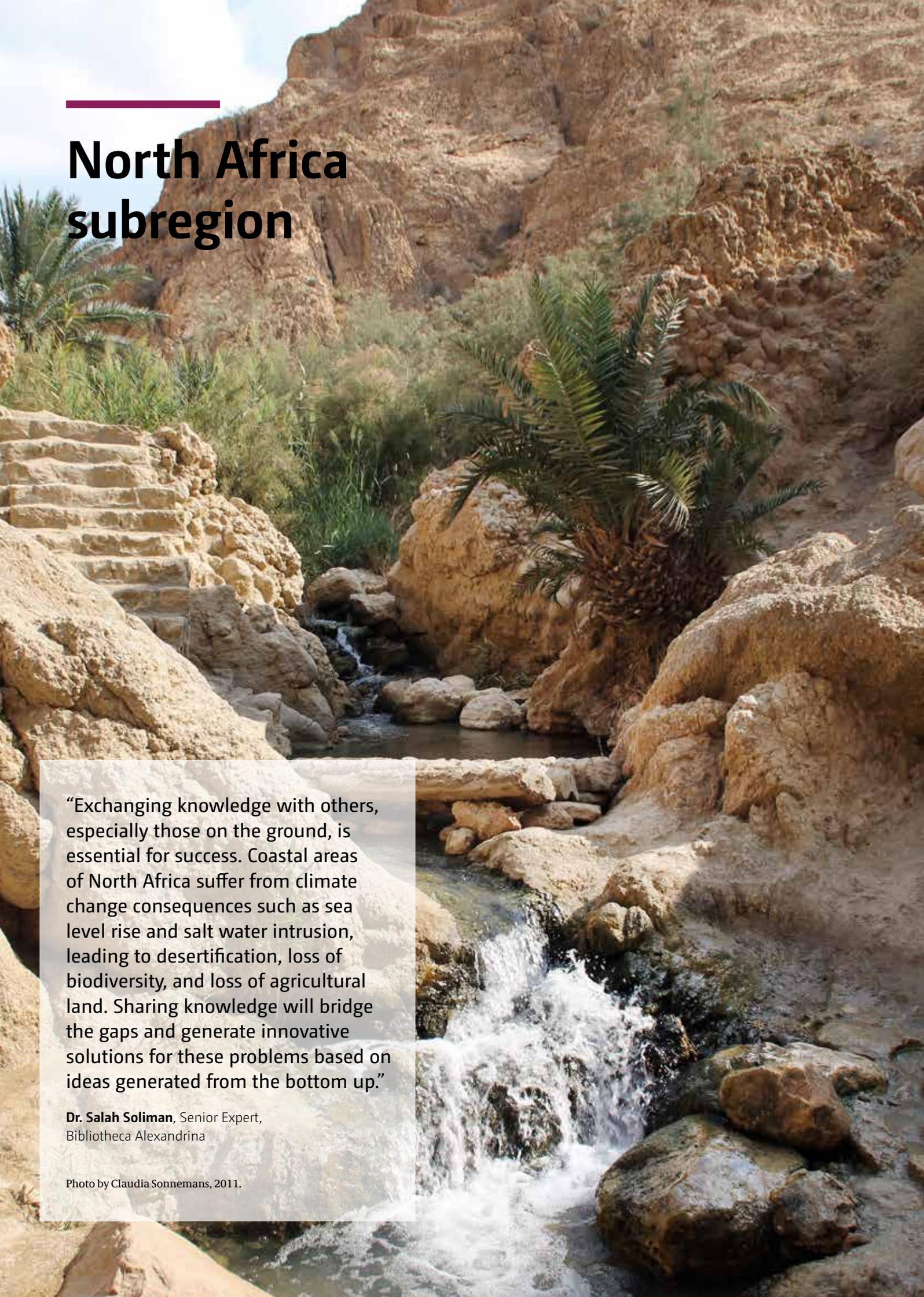
For more information, see the full workshop report available via the Adaptation knowledge portal at <http://www4.unfccc.int/sites/nwp/Pages/Home.aspx>

North Africa subregion

“Exchanging knowledge with others, especially those on the ground, is essential for success. Coastal areas of North Africa suffer from climate change consequences such as sea level rise and salt water intrusion, leading to desertification, loss of biodiversity, and loss of agricultural land. Sharing knowledge will bridge the gaps and generate innovative solutions for these problems based on ideas generated from the bottom up.”

Dr. Salah Soliman, Senior Expert,
Bibliotheca Alexandrina

Photo by Claudia Sonnemans, 2011.



Countries covered by the LAKI in the North Africa subregion



VI.

North Africa subregion

Partnership with Bibliotheca Alexandrina

Context

The sixth priority-setting workshop covering five countries in the North Africa subregion took place from **19-21 September 2017** in **Alexandria, Egypt**. The MSG consisted of eight experts from non-governmental organizations, the private and public sector, research institutions, and international bodies working on adaptation and climate finance in the region.

Scoping paper

The scoping paper summarized existing literature for the subregion and identified a total of 45 adaptation knowledge gaps. These related to:

- > Water resources
- > Coastal zones
- > Agriculture
- > Desertification

Priority-setting workshop

Step 1

Refining the pool of knowledge gaps

The MSG refined the knowledge gaps identified in the scoping paper by adding, deleting, merging and/or modifying gaps and categorizing them into thematic groups. An initial list of 43 gaps was generated for the prioritization exercise.



Illustration copyright: <http://www.piktochart.com>

Step 2

Prioritizing the knowledge gaps

The MSG agreed on five key criteria for the prioritization of the adaptation knowledge gaps and individually assessed the importance of each criterion. These individual assessments were then aggregated to determine the relative weights for the criteria (see annex I). The MSG reviewed the 43 knowledge gaps against these criteria, and produced a final list of 18 priority gaps (see Table 6). Closing these priority gaps would result in the most tangible and impactful adaptation benefits for the North Africa subregion.

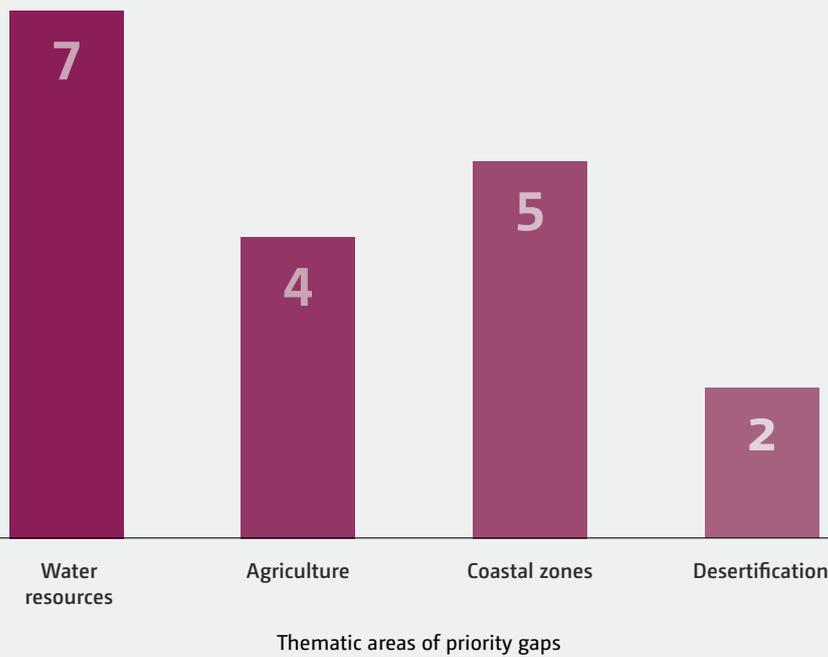
The distribution of these gaps by thematic area is illustrated in Figure 9. Seven priority knowledge gaps are related to water resources, followed by five related to coastal zones and four related to agriculture. Most gaps were due to a lack of data (cluster 1, seven gaps), lack of access to existing data (cluster 2, four gaps), or a combination of these factors (three gaps).

Step 3

Designing possible response actions

The MSG defined potential response actions to close the 18 priority gaps and possible organizations to undertake these actions. To address priority gap nine related to agriculture and livelihoods, for instance, the experts suggested workshops be organized with local farmer groups, co-operatives, and policymakers. For priority gap 18 related to lack of access to data on water quantity and quality, the MSG saw potential for publishing data through existing regional databases. Similarly, lack of data and access to knowledge on rainfall (gap four) could be addressed by sharing policy briefs and projection model outputs via national and regional knowledge hubs (e.g. meteorological offices).

Figure 9 **Number of priority gaps by thematic area for the North Africa subregion**



Implementing actions to close knowledge gaps

The outcomes of the priority-setting workshop, including the full workshop report, can be found on the Adaptation knowledge portal.¹⁵

Bibliotheca Alexandrina is currently coordinating with subregional partners and stakeholders to pursue next steps for closing the knowledge gaps identified under the LAKI.

15. see: www4.unfccc.int/sites/NWP/Pages/LAKI-Africa.aspx

Table 6 | Priority knowledge gaps for the North Africa subregion

No.	Thematic area	Gap description	Cluster	Knowledge user
1	Agriculture	Lack of access to data related to rain-fed agriculture and irrigated agriculture	Lack of access [2]	Researchers, scholars
2	Water resources	Lack of accessible information on climate change impacts on water resources	Lack of access [2]	Water sector managers and policymakers
3	Water resources	Limited understanding of climate variability and trends, including placing current observations into historical context	Lack of actionable knowledge (e.g., in need of repackaging existing knowledge), lack of tools/methods [Mix]	Water infrastructure designers
4	Water resources	Insufficient knowledge on rainfall historical data, trends and projections	Lack of data, lack of access [Mix]	Water resource planners
5	Desertification	Insufficient knowledge and information sharing on solutions/good practices and lessons learned to combat desertification	Lack of data, lack of access [Mix]	Water infrastructure designers
6	Agriculture	Lack of awareness on negative climate change impacts on yield	Lack of access [2]	Water resource planners
7	Coastal zones	Lack of information for developing resilience strategies in urban planning in coastal zones	Lack of data [1]	Ministries of Agriculture
8	Water resources	Lack of accurate information on status of water resources (i.e. water availability, consumption patterns, water quality)	Lack of data [1]	Ministries of Water
9	Agriculture	Lack of awareness on negative climate change impacts on livelihoods	Lack of access, lack of actionable knowledge (e.g., need to repackage existing knowledge) [Mix]	Farmers organizations, local authorities
10	Desertification	Insufficient information and knowledge about interconnections between desertification and socio-economic development	Lack of data, lack of actionable knowledge (e.g., need to repackage existing knowledge) [Mix]	Government, agricultural and rural advisory services providers

No.	Thematic area	Gap description	Cluster	Knowledge user
11	Agriculture	Limited information and knowledge sharing on interlinkages with other sectors	Lack of access, lack of actionable knowledge (e.g., need to repackage existing knowledge) [Mix]	Decision makers, policymakers and planners
12	Coastal zones	Limited knowledge on the benefits of integration of coastal management and protection into national development plans and priorities	Lack of data, lack of actionable knowledge (e.g., need to repackage existing knowledge) [Mix]	River basin agencies, environmental institutions, and water resource planners
13	Coastal zones	Need for improved information regarding population dynamics within sea level rise models	Lack of data [1]	Farmers organizations, local authorities
14	Coastal zones	Lack of information on understanding of risks due to sea level rise among the different coastal zones	Lack of data [1]	Central authorities of demographic statistics
15	Coastal zones	Need for improved information on technologies to protect coastal cities against sea level rise	Lack of data [1]	Ministry of Agriculture
16	Water resources	Limited knowledge on technologies and best practices to adapt to the impacts of climate change on water resources	Lack of data [1]	Policymakers and planners
17	Water resources	Lack of reliable data on water-quantity and quality, including accessibility to available reliable data and databases	Lack of data, lack of access [Mix]	Policymakers and planners
18	Water resources	Limited access to available data on water quantity and quality	Lack of access [2]	Policymakers and planners

For more information, see the full workshop report available via the Adaptation knowledge portal at <http://www4.unfccc.int/sites/nwp/Pages/Home.aspx>

Annex

Prioritization criteria for LAKI subregions

To prioritize the adaptation knowledge gaps, the multi-stakeholder groups in each subregion were asked to agree on a set of evaluation criteria. Workshop facilitators drew from a set of sample criteria prepared for the LAKI to stimulate discussion.

The MSG selected and refined the evaluation criteria as appropriate for the local context. Each MSG member was then asked to rank individual criterion on a scale of one to five with five being the most important. Individual ranking results were used to generate a weighted (relative) percentage for each criterion.

The table below provides an overview of the criteria applied in each subregion. The criteria considered less important relative to others are shaded in light blue. In some subregions, all criteria were weighted about the same. In other subregions, there was a significant difference (ten or more percentage points) between the aggregated weights of criteria.

For more detailed information on the criteria and weights applied in each subregion, please refer to the respective workshop reports available via the Adaptation knowledge portal at <http://www4.unfccc.int/sites/nwp/Pages/Home.aspx>



Photo by Jitendra Raj Bajracharya ICIMOD.

Table 1

General prioritization criteria and weights by LAKI subregion

	Andean	West Asia/GCC	Southern Africa	Indian Ocean islands	Hindu Kush Himalayan	North Africa
Urgency (would generate immediate benefits or address urgent adaptation needs)	●	●	●	●	●	●
Efficacy for influencing policymaking and management processes (including at the local level and across different sectors)	●	●		●		
Impact on ecosystem resilience	●					
Potential to generate sustainable benefits over the long term	●	●	●			●
Positive effects on populations, goods, and public services with no major negative effect	●	●		●		
Scale of impact (relevance for closing a critical gap)	●	**	●			●
Co-benefits for closing other gaps (in other sectors, thematic areas)	●	●	●	***	●	●
Feasibility / ease of filling the gap (with existing human, economic, and institutional resources)	●				*	●
Potential to reduce uncertainty	●					

● Using the method explained, experts assigned other criteria greater weight.

* The Hindu Kush Himalayan subregion MSG split criterion 8 into two separate criteria: “doability” (given half the weight of the other criteria) and “The last missing mile of the journey – what can be obtained by utilizing readily available means”.

** The West Asia/GCC subregion MSG split criterion 6 into two separate criteria with the same weights: “Potential to support climate resilience across sectors and systems” and “significance of impact on closing the gap”.

*** The Indian Ocean islands MSG revised criterion 7 to read “Potential to support climate resilience across sectors and systems”.

For more information on the
Lima Adaptation Knowledge Initiative,
please visit <https://unfccc.int/nwp>
or contact: nwp@unfccc.int "



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