

Leveraging multi-stakeholder partnerships for integrated water resources management in Afghanistan

Process, accomplishments, and
lessons learnt



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Neera Shrestha Pradhan
Programme Coordinator, SWaRMA
ICIMOD

Foreword

There is an urgent need to manage water resources more effectively and equitably in the mountain and hill regions of the Hindu Kush Himalaya (HKH). Not only is demand increasing for domestic use, irrigation, industry and energy, the effects of climate change are also now being manifested in river basins as changes in the hydrological regime and less predictable hydrological cycles.

As a regional knowledge centre, ICIMOD supports regional collaboration and develops and shares information and knowledge resources with its member countries to implement different projects. In this regard, SWaRMA focused on co-creating learning opportunities to strengthen water resources management in Afghanistan. The project has grown and shown tremendous potential over the past two years in promoting collaboration among relevant departments and organizations working in the water resource sector of Afghanistan. Through

this, it has gathered a wide range of experience such as leading stakeholder engagement, application of hydrological and climate models and glacier and flood monitoring tools, integrated management of river basin, and the development of a regional platform to share knowledge.

I would like to congratulate the governments of Afghanistan and Australia, the SWaRMA team at ICIMOD and CSIRO, and Afghan partners on the successful partnership. I hope all the partners will continue their association and wish them the very best for the future.



David Molden
Director General
ICIMOD

Afghanistan's economy is highly dependent on the agricultural sector. Efficient management of water resources is crucial for agriculture. The government of Afghanistan is therefore working to promote effective utilization of surface and groundwater as well as to strengthen hydropower and industrial infrastructure.

During the Afghan President's recent visit to Australia, the Government of Australia made a commitment to support Afghanistan's water resource management through the SWaRMA project. SWaRMA was implemented by ICIMOD and CSIRO with Afghan partners to enhance the individual and institutional capacity of different sectorial ministries, non-government organizations, and academic institutions.

Managing a multi-stakeholder project is a tough task, but ICIMOD has fulfilled the project expectations exceedingly well. On behalf of the Ministry of Agriculture, Irrigation & Livestock, and

as a board member of ICIMOD, I sincerely thank the Australian government for their support, and would like to express my appreciation for the SWaRMA team at ICIMOD and CSIRO, and Afghan partner ministries, non-government organizations and academic institutions for their continuous support and coordination for the successful implementation of the project.



Mohammad Rafi Qazizada
Director General
Natural Resources Management/
ICIMOD Board Member
Ministry of Agriculture,
Irrigation and Livestock (MAIL)
Afghanistan

Integrated water resources management (IWRM) was adopted in 2009 as a suitable approach for sustainable management and development of water resources in Afghanistan. The Afghanistan National Water Sector Strategy identifies issues of importance and develops policies in the field of water resources. Three of its seven strategic objectives are: assessing water resources; reducing water-related climate risks; and promoting international cooperation.

Working in seven thematic areas, SWaRMA supported the government of Afghanistan in capacity enhancement in water resources management and in achieving progress under the UN Sustainable Development Goal 6. These efforts have also been synchronized with the country's national goals related to water resource management.

The National Water Affairs Regulation Authority of Afghanistan would like to sincerely thank the

Australian government for supporting the water sector of Afghanistan, and ICIMOD and CSIRO for the successful implementation of the project. We also express our gratitude to the national partner ministries, academic institutions, and other organizations for their support, especially to General Directorate of Water Resources for their great effort and collaboration. Learning from the success of SWaRMA, we in Afghanistan hope to continue this excellent work in the coming days.



Khan Mohammad Takal
Director General
National Water Affairs Regulation Authority
(NWARA)
Afghanistan

About the project

Strengthening Water Resources Management in Afghanistan (SWaRMA) was a two-year project (2018–2019) supported by the National Water Affairs Regulation Authority (NWARA) – formerly the Ministry of Energy and Water (MEW) – Government of Afghanistan, and the Government of Australia. The project was implemented by the International Centre for Integrated Mountain Development (ICIMOD) and the Commonwealth Scientific and Research Organization (CSIRO). It aimed to strengthen water resources management in Afghanistan by assessing water resources at various levels, monitoring the cryosphere and floods at the community level, developing and using water information systems, fostering integrated river basin management (IRBM), and supporting Afghanistan’s regional engagement to showcase result-based outcomes.

Domain of intervention

SWaRMA undertook work in seven thematic areas integrating capacity enhancement, knowledge co-creation, and co-learning platform facilitation (Figure 2).

Objectives

1. To generate technical and institutional knowledge to effectively increase the management of water resources
2. To develop a roadmap for water information system
3. To strengthen existing networks and platforms to increase the participation and awareness of Afghan stakeholders

Scope of operation

SWaRMA operated at various levels. At the regional level, discussion platforms and networks were created to learn and share scientific research findings and for networking. Tools and assessments at national and basin scales were implemented with a specific focus on the Kabul river basin (Figure 1). Field-based activities including cryosphere and flood monitoring were conducted at specific sites at the local level.

FIGURE 1 SWARMA SCOPE OF INTERVENTION

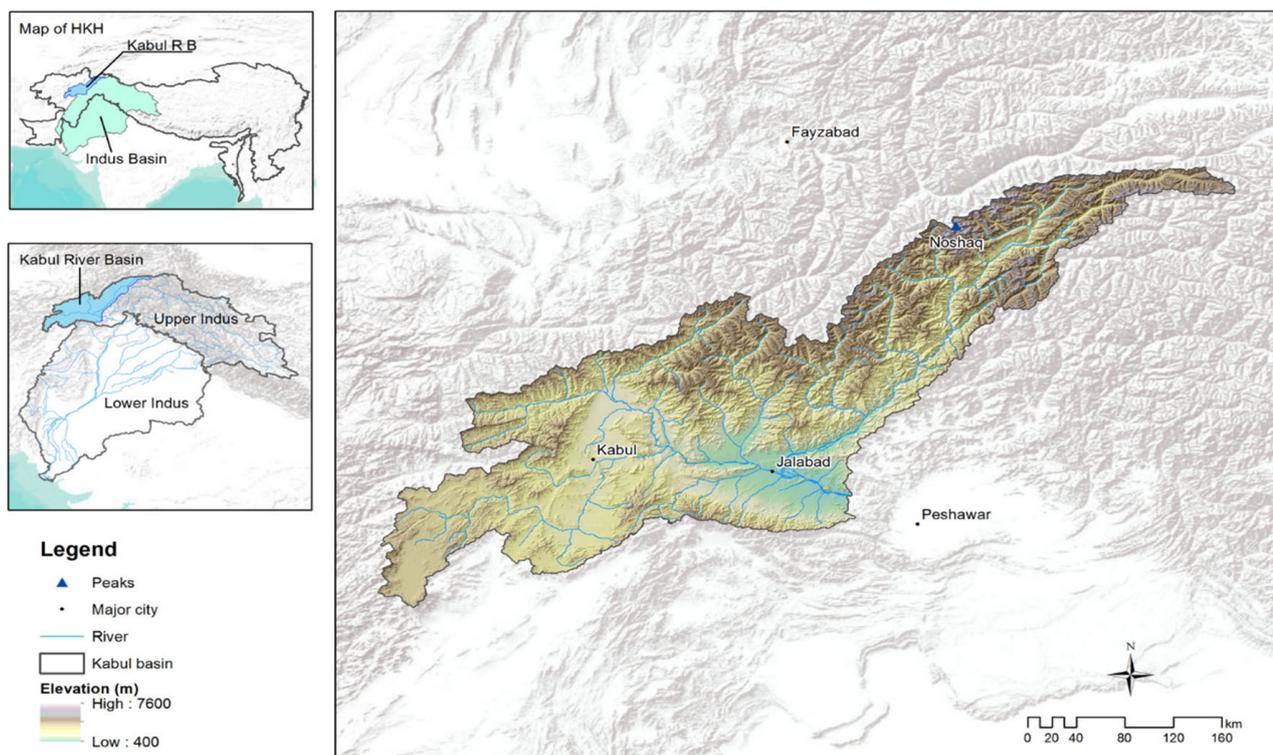
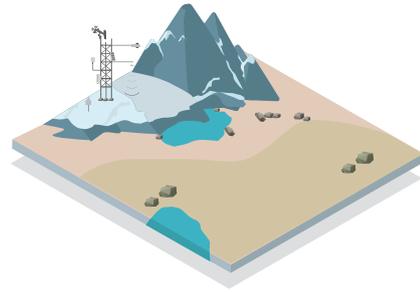


FIGURE 2

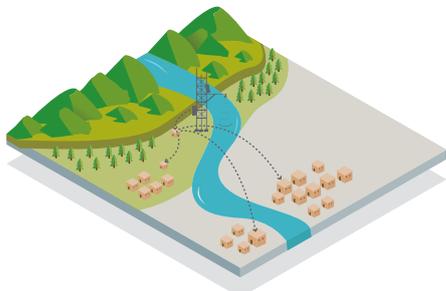
SWARMA THEMATIC AREAS OF INTERVENTION



Water availability analysis: Co-create knowledge on water resources assessment in the Kabul river basin using hydrological models



Cryosphere monitoring: Theoretical and field based co-learning opportunities for young Afghan professionals to monitor snow cover, glaciers, and hydro meteorology



Flood monitoring and early warning Hands-on-training to generate flood information through community based flood early warning system (CBFEWS) and enable community preparedness



Integrated water resources management Capacity enhancement package to provide learning and knowledge sharing platform to implement integrated river basin management



Water resources assessment at basin scale Capacity enhancement on basin-level planning for decision making in complex time consuming and data limited environment



Water information system Co-produce online platform on water information system (prototype)



Regional cooperation Encourage science-based dialogue in Afghanistan to address water resource management at regional level and strategic engagement in regional dialogue

The process

SWaRMA organized more than 37 major events with 271 participants encouraging women's participation (approx. 10% women). The initiative was able to enhance individual and institutional capacities through a series of focused events, resulting in grounded activities. Effective needs-assessments were undertaken and agreed upon early on in the process; institutional commitment and ownership was ensured; and contiguous training series created synergies through co-creating and co-learning opportunities and continuous follow-up, which resulted in a multiplier effect. The capacity of partner institutions was measured using a clear framework including baseline and end-line capacity self-assessments and tracer surveys.

Key achievements

1. First benchmark glacier established in Afghanistan: For the first time Afghanistan has established a benchmark glacier for long-term monitoring of cryosphere. Mass balance measurement has started in Pir-Yakh glacier and an automatic weather station has been installed.
2. J2000 hydrological modelling widely adopted in Afghan river basins: The J2000 hydrological model is now adopted by the NWARA for water resources assessment in 16 sub-basins of the Kabul basin and 5 other basins in Afghanistan, and technical support was provided to integrate the model in the university curriculum.
3. Science-based multi-stakeholder partnership and platform established: The multi-stakeholder partnership model promoted by SWaRMA in Afghanistan was highly appreciated by the Afghan partners as it provided a common platform for experts from various government and non-governmental organizations to discuss issues of common concern. The regional Upper Indus Basin Network (UIBN) and its Afghanistan Chapter (UIBN-AC) provided an opportunity to share science-based knowledge and to learn from other basin countries.
4. Knowledge on multi-scale integrated river basin management enhanced: Multi-scale IRBM was conceptualized and tested with technical support from more than 50 experts from ICIMOD, Australia, Afghanistan, and Nepal, who provided a conceptual framework for water resources management in the context of the Hindu Kush Himalaya (HKH), and specifically in Afghanistan.
5. Roadmap for water information system (WIS) prepared: A roadmap for WIS was prepared. The roadmap includes a long-term vision for WIS development, detailed next steps for developing a national WIS, specific activities for capacity development, and a sustainable data platform for Afghanistan.
6. Technology for flood monitoring transferred: Telemetry based flood monitoring was piloted in Pariyan and Peshghor areas in Panjshir province and successfully tested in Pariyan.
7. Assessment of GESI integration conducted: An assessment of GESI in water resources management policy, institutions and implementation was initiated in key ministries with technical training on implementing a gender-integrated approach.
8. Source model introduced for scenario-based planning: The project developed the NWARA's capability to model the river systems and explore/assess the impact of development scenarios on water availability and demand using the Kabul basin eWater Source model.

The context

WRM policy discourse in Afghanistan

Afghanistan's new water law focuses on stakeholder participation in water management, equitable water allocation, division of tasks at the national, basin and sub-basin levels, and the participation of all stakeholders in decision-making. Based on the new water sector policy, the objective of IWRM is to gradually decentralize activities to river basins and sub-basins, and to promote the sustainable use of water. However, the implementation has been challenging due to inadequate capacity of staff and the lack of effective rules and regulations for water use.

Afghanistan has set ambitious SDG goals that need robust institutional and policy support. For example, Afghanistan employs an estimated 60% of its population in the agricultural sector (Muradi and Boz, 2018), for which proper access to water resources is essential. Along with adopting an IWRM approach, planning would need to account for “urban, rural, agricultural, industrial, and environmental uses” (Azimi, 2007) of water. Afghanistan's National Development Strategy (ANDS) however does recognize that WRM should be “undertaken in a holistic, integrated and sustainable manner” (Government of Afghanistan, 2008).

Co-creation and co-implementation

While there is a general consensus that capacity building is an important issue for Afghanistan, there is also concern that current capacity building efforts are not sufficient to produce desired results. In many cases, capacity building efforts are supply driven, piecemeal and duplicative. This project focused on institutional capacity building so that the targeted institutions would be better positioned to contribute improved knowledge and information systems in water resources management. The principle of co-creation was a key point of consensus among the SWaRMA and ministerial representatives at the inception workshop. The project coordinated with key ministries within the government, working with departments in ministries concerned with agriculture, energy, water, and environment. Knowledge co-creation and co-implementation was fostered through a dedicated series of events, paving the way for results-based activities. Needs

assessments were targeted and effective, and institutional commitment and ownership was ensured. The resultant contiguous training series created synergies, co-creating and co-learning opportunities, and with continuous follow-up resulted in a multiplier effect.

Multi-stakeholder partnership

A multi-stakeholder partnership approach was introduced to implement SWaRMA's ambitious vision, which required support from nodal ministries. It brought representatives from different Afghan ministries working on WRM (Figure 3) together on one platform to discuss issues of common concern. The inception meeting allowed participants to discuss the partnership modality for the project.

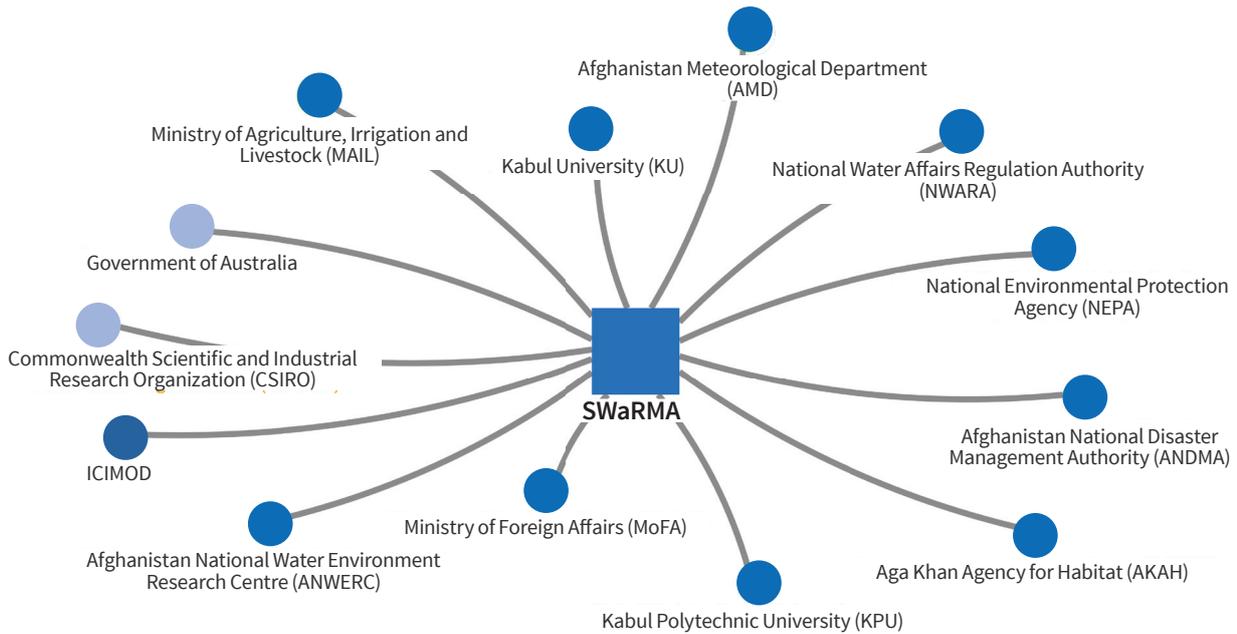
Considering that partners are remotely stationed, and realizing that access to project areas is difficult, a remote multi-stakeholder partnership approach was adopted; it focused on building an environment of openness, trust and ownership. The project ensured that decisions were taken only after discussion with partners. Focal persons nominated from partner organizations facilitated the communication process, explained the partners' roles and kept them motivated, and ensured there was no conflict.

The SWaRMA partnership made the following achievements:

- Strengthened strategic and regional cooperation among and between partners in and outside Afghanistan
- An internalized concept of ownership among partners creating greater chances of sustainability
- Higher quality development solutions and higher likelihood that co-development solutions will be adopted and up-scaled
- Greater alignment of goals among partners
- Greater accountability and improved reputation of the project and its owners
- Some of the key best practices include:

FIGURE 3

SWaRMA'S PARTNERSHIP LANDSCAPE



- Contextualizing to understand the environment in which all partners operate
- Communicating to develop engagement and trust among all partners
- Promoting collaborative platforms for co-development and co-implementation of activities
- Capacity enhancement to share responsibilities and create an enabling learning environment

of Afghan water professionals would be broadened through a number of modelling tools, frameworks, and exercises. The institutional level change was expected to make the institutions open and willing to adopt new techniques, approaches and technologies. This would require the leadership to be flexible and willing to adapt to changes.

An analysis of water resource management in Afghanistan broadly identified the following barriers to achieving the SDGs:

- Underutilization of water and high variability in water availability across time and space
- Limited understanding of climate change effects and future changes in water resources/scenarios
- Contribution of the cryosphere to water resources management is not fully explored or understood.
- Communities suffer during floods because the current flood early warning system is not adequate to save lives and livelihoods.
- Inadequate transboundary cooperation resulting in underutilization of benefits from water resources and increased vulnerabilities
- Inadequate capacity of water professionals within the Government of Afghanistan for addressing these challenges

Theory of Change and Impact Pathways

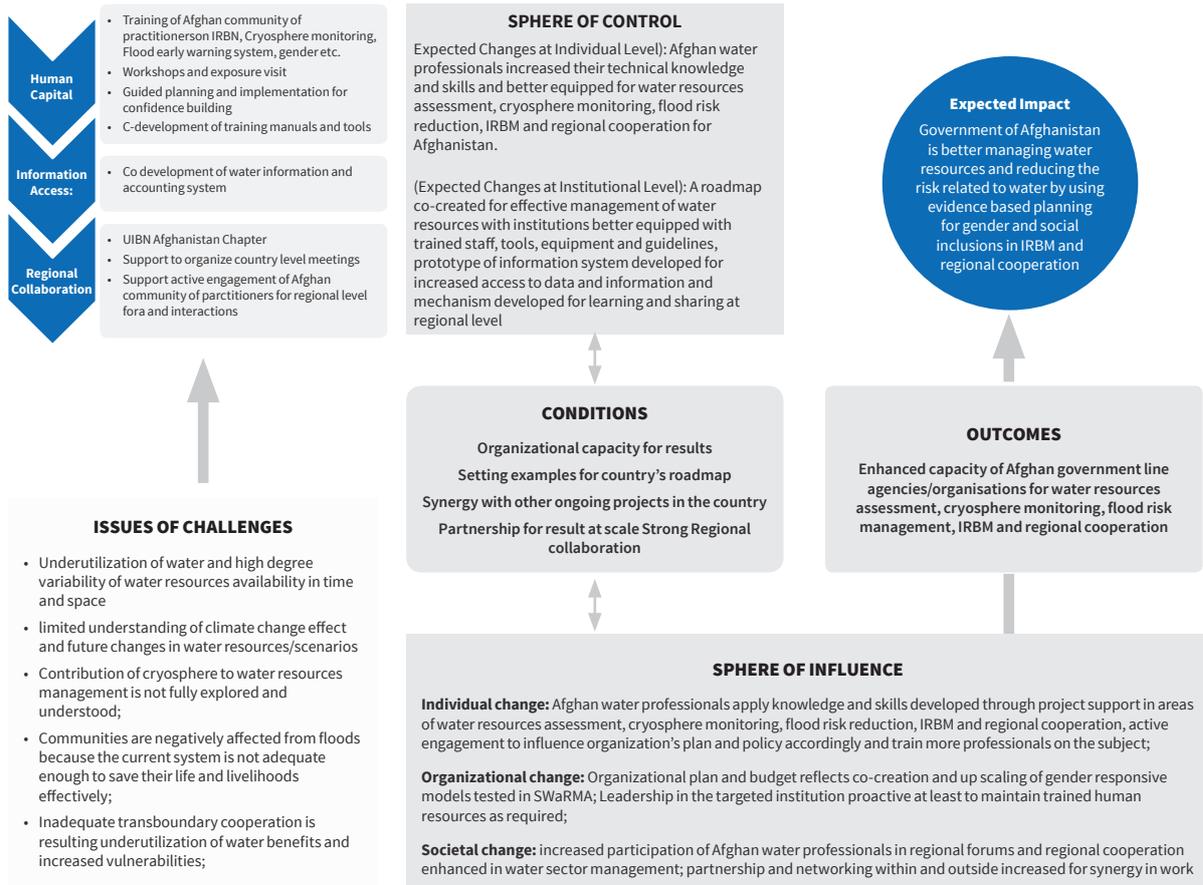
Context of change

SWaRMA's Theory of Change¹ (ToC) framework stated the project's key objective, which was to ensure that the Government of Afghanistan developed institutional capacity to understand and manage changes in the country's water sector. It then elaborated a combination of change pathways with causal linkages with key indicators leading towards objective achievement. One of the expected changes was increased capacity (Figure 4) of the nodal ministries at the individual and institutional level. At the individual level this was envisioned through a number of technical trainings offered. It was also envisioned in the ToC that the skillsets

¹ <https://www.theoryofchange.org/what-is-theory-of-change/>

FIGURE 4

SWaRMA THEORY OF CHANGE



Pathways for impact

The three change pathways to achieving SWaRMA's objectives were outlined in the ToC:

CHANGE PATHWAY 1
Human capital development

The first pathway focused on developing the knowledge, skills and confidence of relevant individuals within nodal agencies through a variety of trainings in assessment, monitoring, planning of water resources, cryosphere, floods, and gender and equity issues. The trainings were co-developed with the country stakeholders to ensure they were tailored to their needs. The learnings from each experience were documented for future reference at the organization level. Rather than being one-off training sessions, these were planned as a series of individual and organizational capacity enhancing events leading towards results-based outcomes and impact on the ground. Further, the organization's leaders were also engaged to ensure consistency in training quality and delivery. This resulted in increased confidence on their part to continue similar activities beyond the lifetime of SWaRMA.

CHANGE PATHWAY 2
Access to information

The second expected outcome was increased access of water professionals to key national level data in Afghanistan, which further enabled them to promote and generate information, encouraged evidence-based decision-making, and helped envision a roadmap for a water information system for Afghanistan.

CHANGE PATHWAY 3
Regional collaboration

The third pathway supported in creating a network of national level water professionals that had access to other countries in the region through regional knowledge sharing platforms like the Upper Indus Basin Network (UIBN). This provided them the opportunity to understand transboundary issues in the river basins of the HKH, and the coordinated efforts required to address transboundary challenges.

Broad strategies

The project team came up with the following strategies for achieving the above-mentioned outcomes:

1. Organizational capacity for results
2. Setting examples for roadmap
3. Build synergy with other ongoing projects
4. Strengthen partnership for result at scale
5. Strong mechanism for regional collaboration and synergy

SECTION 3

Key achievements

SWaRMA made a number of achievements within a short time and with limited financial resources. It has strengthened multi-stakeholder partnership and leadership, promoted engagement among a range of actors including government partners, and created a platform for discussing issues of common interest and producing science-based knowledge at the regional level. The project made efforts to integrate gender and social aspects in programme design and implementation. It envisioned and implemented various tools and models for water management and generated good examples of enhanced capacity, skill and knowledge. The activities will be continued by Afghan partners beyond SWaRMA.

Enhanced capacity in hydrological modelling

Understanding water availability scenarios is crucial for water resources planning and management. Rivers in Afghanistan are fed by melt from snow and glacier. Climate change is posing a serious threat to water resources and ultimately to the livelihoods of those who depend on water resources. SWaRMA worked with the relevant nodal agencies to strengthen the capacity to quantify water availability and assess how climate change will affect the spatial and temporal distribution of water.

A series of J2000 hydrological model trainings were organized (Figure 5) to enhance the capacity of Afghan water professionals to analyse both the water availability of the Kabul river basin and the impact of climate change. The J2000 hydrological modelling approach is widely used in the HKH river basins representing snow, glacier and rainfall-runoff processes. Through a series of capacity building trainings, participants from different line agencies working on water resources were trained on hydrological modelling of the Panjshir catchment and a series of models and projections on future water availability for the Kabul River basin was developed. The findings were presented to the deputy minister at the Water Resources Department and the modelling was implemented in other sub-basins. Further, the group involved in the modelling prepared a report detailing the water availability of 16 sub-basins of the Kabul River basin (Table 1). The report was presented at a national workshop in the presence of the NWARA minister and more than 100 participants before being handed over to the president's office. A WebHRU platform was also created for Kabul River basin hydro-met data management.

NWARA applied J2000 hydrological modelling in 16 sub-basins in Afghanistan. The report was submitted to the President's office, which is expected to aid key ministries in making decisions on water resource planning and management within these basins.

FIGURE 5

TIMELINE OF THE J2000 HYDROLOGICAL MODELLING TRAINING

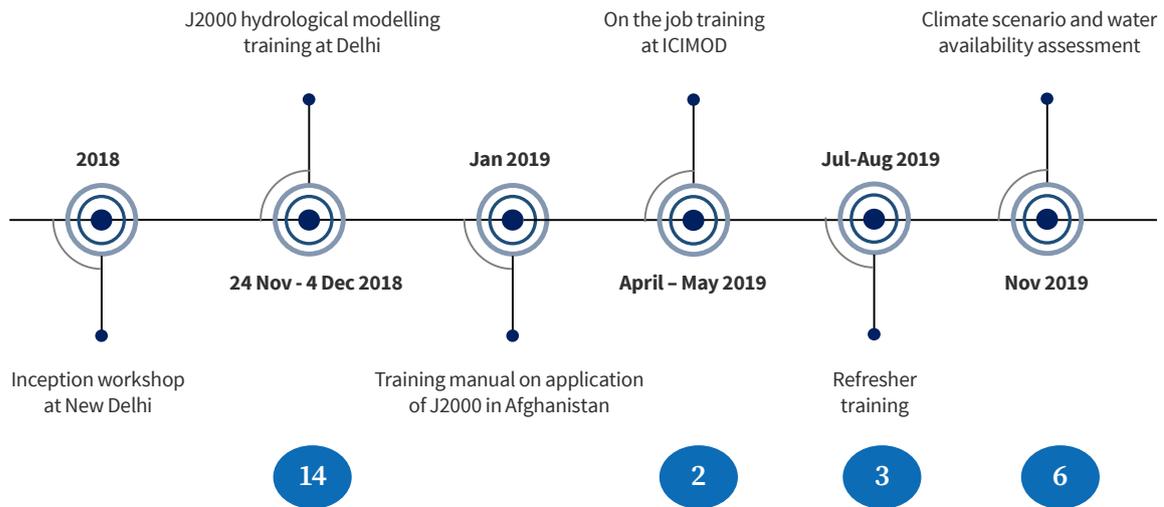


TABLE 1

APPLICATION OF THE J2000 HYDROLOGICAL MODEL IN THE BASINS/SUB-BASINS

River basin	Sub-basin
Harirod Murghab	(Murghab) Chedukhtaran
Helmand	Arghandab Sub-basin
	Upper and Lower Helmand sub-basins
Kabul	Panjshir sub-basin
	Alingar
	Ghorband wa Panjshir
	Chak wa Logar Rod
	Kabul
	Kunar
	Gomal
	Gomal sub-basin
North	Balkhab sub-basin
	Khulm sub-basin
	Shamal
Panj Amu	Kokcha sub-basin
	Taluqan sub-basin

The trainings increased the confidence of early-career staff and provided a scientific basis for making decisions about adaptation strategies. NWARA has integrated J2000 hydrological modelling in their system and SWARMA interns will continue to provide technical support to implement it in other sub-basins of Afghanistan.

Establishment of the first benchmark glacier

Glaciers serve as important indicators of changes in climate. The national environmental protection agency of Afghanistan has noted that a large portion of the country’s freshwater supply originates in glaciers (Ahmadi and Siddique, 2019). Located in Paryan district of Panjshir province, the glacier is known to be one of the biggest in the province with an area of 1.70 km². Trainees from the NWARA, Kabul University (KU) and ICIMOD interns took part in a glacier expedition training in Nepal, and commissioned a field mission to Pir-Yakh glacier to establish the first long-term glacier monitoring site at an altitude of 4531 metres (Figure 6). Data from the field mission will allow modelling exercises to predict the future hydrological scenario of the glacier and its surrounding regions.



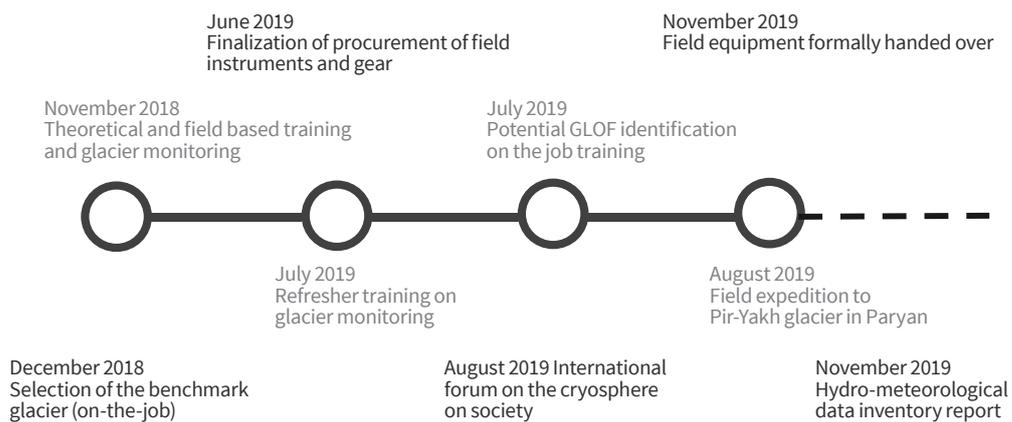
BENCHMARK GLACIER MONITORING EQUIPMENT HANDOVER TO PARTNER NWARA DURING THE 3RD SWARMA’S STEERING COMMITTEE MEETING, 22 NOVEMBER 2019



BENCHMARK GLACIER MONITORING STATION AT PIR-YAKH GLACIER, AUGUST 2019

FIGURE 6

TIMELINE FOR ESTABLISHING THE FIRST BENCHMARK GLACIER IN AFGHANISTAN



NWARA and KU established the first ever benchmark glacier monitoring station for long-term scientific monitoring of Pir Yakh glacier in Kabul basin.

The WRD is also working to establish a new glaciological section dedicated to working on the cryosphere with the same group of experts from the NWARA and KU. In an interview, Hedayatullah Arian, Head of the Hydrometeorology Department, KU, explained, “We started our first glacier monitoring activities on Pir-Yakh glacier in Panjshir province. It is a big glaciated basin in Afghanistan and can be accessed easily, without any security issues. In the next five years, we will focus on extending the stake network on Pir-Yakh and submit the data to the World Glacier Monitoring Service (WGMS). If everything goes well, we will extend our field monitoring to other glaciers as well.” The glacier monitoring station was handed over to the NWARA to ensure long-term monitoring of the benchmark glacier in Afghanistan.

Technology transferred for flood monitoring

Trends show that increasing disaster impacts are leading to greater loss of life and livelihoods in the HKH. On 12 July 2018, at least 10 people, including two women, lost their lives to a flash flood in the Panjshir Valley. The flood destroyed around 200 houses and over 100 shops in Peshgor village and caused the closure of a major highway. This GLOF event prompted the WRD to initiate discussions on and analyse the need of a flood monitoring mechanism. The WRD’s water strategy document (2019–2024) recognizes the significance of establishing a community-centred flood early warning system in each river basin, working in close coordination with the provincial governments, to reduce the impact of disasters such as floods.

Earlier in 2015 ICIMOD, along with the Aga Khan Agency for Habitat (AKAH) and the Afghanistan National Disaster Management Authority (ANDMA), had carried out a similar intervention in Baghlan, Afghanistan to demonstrate the Community Based Flood Early Warning System (CBFEWS) technology. This small-scale EWS programme influenced the design and conceptualization of different multi-hazard EWS projects by the AKAH at a national scale.

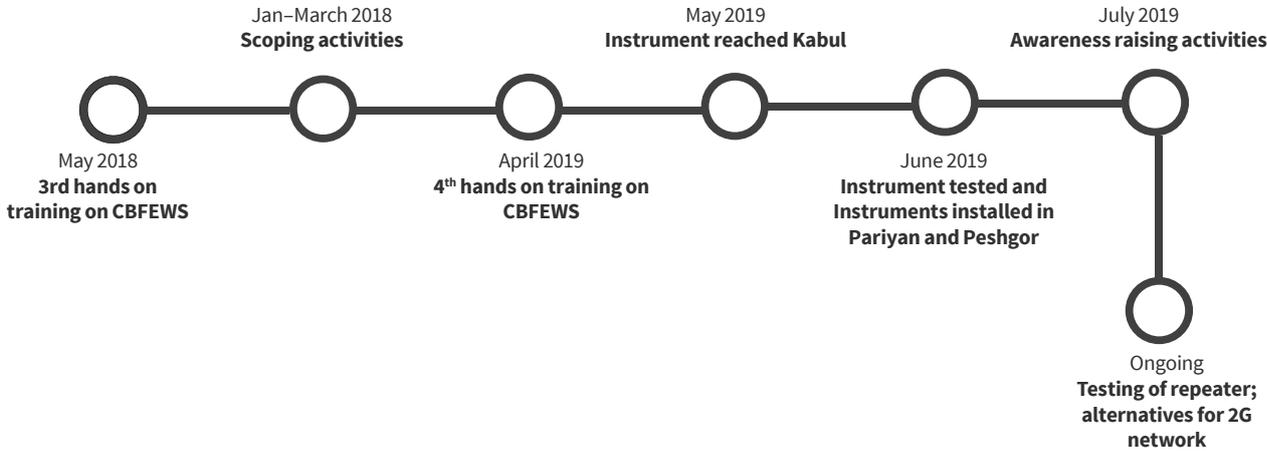
Through SWaRMA, participants from the WRD and AKAH received a five-day training that provided them an overview of floods and hands-on experience in the operation and upkeep of the CBFEWS technology (Figure 7). CBFEWS is a low-cost technology and provides almost real-

A telemetry-based flood monitoring technology was transferred to NWARA and AKAH, and tested successfully in Paryan district of Panjshir sub-basin.

time information to the vulnerable communities. With remote technical assistance from experts in Kathmandu, the trainees were able to successfully install the telemetry-based instrument in the Panjshir River. The challenge was the lack of 2G-network coverage in the sites for disseminating the information. Later, in collaboration with Roshan Telecommunications, the instrument in Paryan was successfully tested, ensuring that it was functional and provided good network coverage.

As the new technology for flood warning has been successful tested, the WRD-NWARA can out scale it to other rivers. For sustainability, the AKAH has offered to scale up the intervention with the NWARA and ANDMA beyond the SWaRMA project period, with support from ICIMOD experts.

FIGURE 7 TIMELINE OF TELEMETRY-BASED FLOOD MONITORING TECHNOLOGY TRANSFER IN AFGHANISTAN





CBEWS INSTALLED AT PARIYAN DISTRICT OF PANJSHIR PROVINCE, JUNE 2019

Increased capacity for multi-scale IRBM

The Government of Afghanistan has adopted the integrated water resource management (IWRM) approach for improving the management of the country's water resources at the river basin level. The need to use IWRM in policymaking emerged during the development of the new water law and water sector strategy in 2011. The approach encourages decentralization and attaches high priority to the participation of stakeholders in water resource management. Key decision makers within the government have highlighted the need to build synergy and include university students, youth and women in decision making.

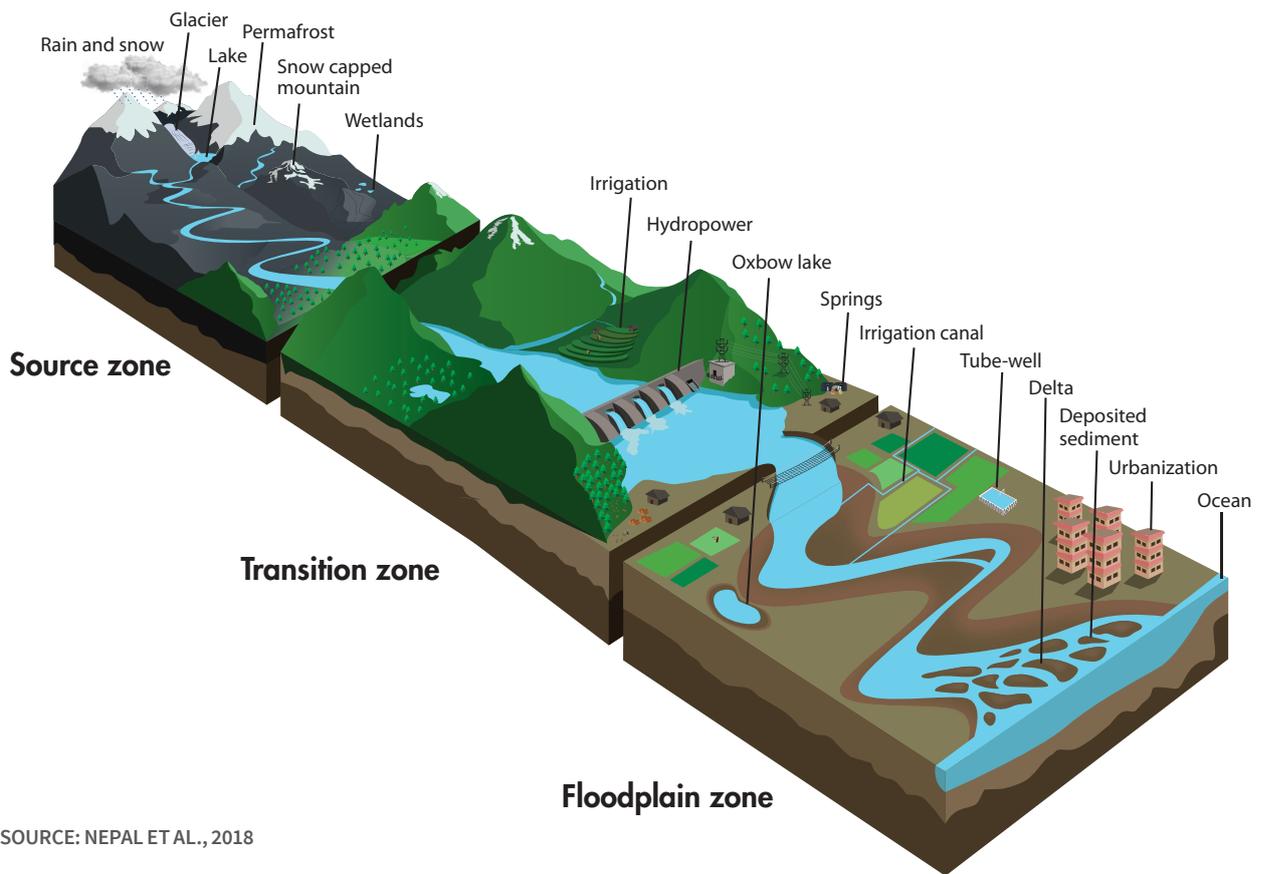
There are strong upstream-downstream linkages (Figure 8) in Afghanistan's river basins, with connections at multiple scales. The IRBM approach was introduced through a comprehensive training workshop based on a multi-scale IRBM resource book. The book was conceptualized by an interdisciplinary team consisting of more than 50 experts from ICIMOD, Nepal, Australia and Afghanistan. After the workshop the participants went on a three-day field trip, travelling from the headwaters to the plains in the Koshi river basin in Nepal. The trip allowed them to directly observe IRBM issues on the ground.

The multi-scale IRBM resource book was developed to equip researchers and practitioners in the Himalayan region to better understand the multi-faceted nature of river basin management.

The IRBM resource book also shows the importance of co-learning among different stakeholders. It highlights the significance of collating regional knowledge and experiences for promoting sustainable water resource management. It is expected that the multi-scale IRBM training will be continued as an annual flagship event under the River Basins and Cryosphere programme at ICIMOD. This will help promote the IRBM approach to other institutions and governments in the HKH.

FIGURE 8

UPSTREAM-DOWNSTREAM LINKAGES



SOURCE: NEPAL ET AL., 2018



MULTI-SCALE INTEGRATED RIVER BASIN MANAGEMENT PARTICIPANTS' EXPOSURE VISIT, FEBRUARY 2019

Developed scenario-based planning

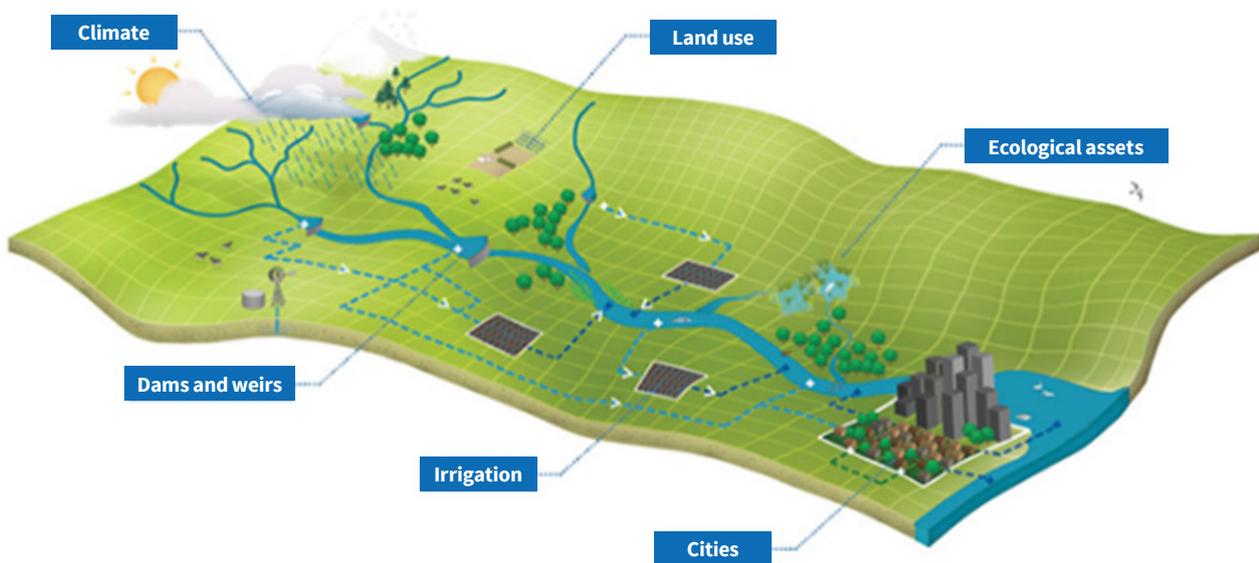
Uncertainty in managing water resources can come from a number of factors such as unfavourable policy environment, and difficulty in predicting socioeconomic and political trends. In Afghanistan's context, this is why a scenario-based planning approach was helpful. A lack of reliable and timely assessment of water resources and uses, infrastructure, and service performance has hindered investment in Afghanistan's water sector.

A prototype source model of the Kabul River system, co-developed for training purposes, incorporates detailed water use and demand rules. This model can be used to explore basic infrastructure development scenarios and would help decision makers to take factors of uncertainty into consideration while making water management plans (Figure 9). Source helps to recreate real world factors such as climatic, ecological and water use decisions in a modelling scenario, making it quite a robust tool.

The trainees will be able to apply the skills they learned to other river basins in the future. In the immediate term they might be able to put their skills to use in an integrated water resource development investment project in Arghandab; the project is aimed at improving irrigated agriculture, urban water supply and power generation for Kandahar, Afghanistan.

A prototype source model of the Kabul River system was developed incorporating the detailed water use and demand rules.

FIGURE 9 SCHEMATIC DIAGRAM OF COMPONENTS OF SCENARIO MODELLING



SOURCE: EWATER

Roadmap for water information system established

As Afghanistan works towards developing a framework for WRM, it is important to manage information to understand which sectors need attention, coordination, and allocation of resources. A water information system (WIS) was developed by CSIRO in collaboration with a team of engineers from the NWARA to collect, collate and validate data from various sources in a centralised national database. The goal was to produce timely, accurate, reliable and comprehensive information at basin, sub-basin, watershed and catchment scales to enable effective and efficient implementation of IWRM in Afghanistan.

A scoping exercise revealed the need to build the ministry’s capacity in data management and governance in order to prepare a roadmap. Technical requirements were also assessed to better understand the type of information architecture required, data validation, and efficient storage, among other factors (Figure 10).

Based on the scoping of the ministry’s capacities, the roadmap recommended an initial four-year development in two phases. Phase 1 involved building on past investment in the development of hydromet information services. A team from CSIRO and the Government of Afghanistan proposed eight actions to consolidate existing institutional capability and systems. Appropriate governance arrangements were set up in the same phase. In Phase 2, five actions are recommended to develop

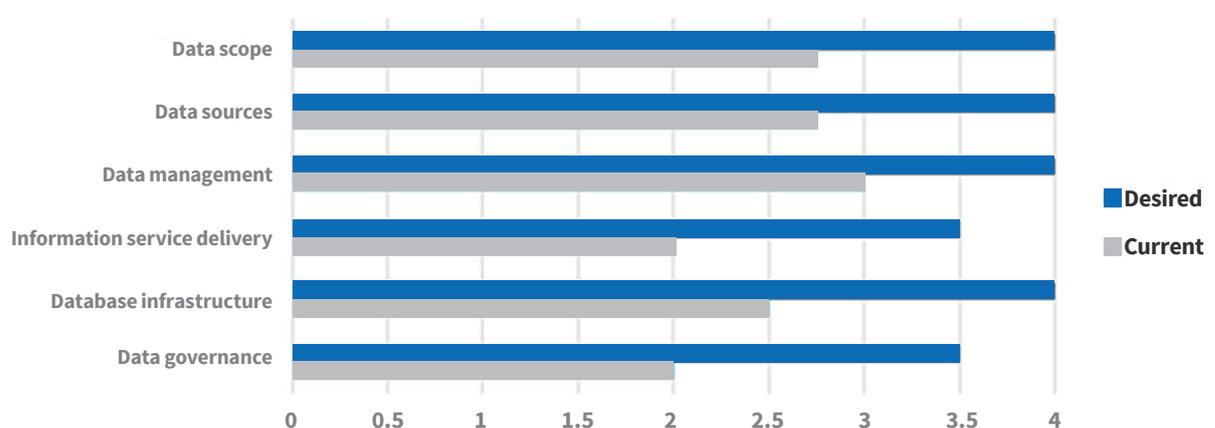
A roadmap for a water information system in Afghanistan was developed as a central database for decision making.

information services. Along with identifying 49 different water data related products, the roadmap helped identify how the government of Afghanistan would continue to collaborate with partners beyond SWARMA to further implement the WIS roadmap.

Informed engagement in science-based collaboration

Afghanistan is dependent on meltwater from the Indus River basin, which was recently ranked as one of the most vulnerable basins (Immerzeel et. al, 2019). The changes in the Upper Indus basin will have an impact on communities in the coming century. For this and many other reasons, Afghanistan has envisioned an adaptive and resilient vision to respond to climate change vulnerabilities as part of its Nationally Determined Contributions (NDCs).

FIGURE 10 RESULTS OF A SURVEY ON THE DEVELOPMENT OF A WATER INFORMATION SYSTEM



SOURCE: (CSIRO AND AFGHANISTAN MINISTRY OF ENERGY AND WATER, 2020)



SWARMA'S FIRST UIBN AC MEETING IN DELHI, OCTOBER 2018

Through SWaRMA, key government institutions in Afghanistan are linked with the Upper Indus Basin Network (UIBN), a network that shares science-based evidences and research with the countries that share the basin – Afghanistan, India, Pakistan and China. The Afghanistan Chapter of the UISBN (UIBN-AC) has played an instrumental role in establishing a governance mechanism to provide a platform for water experts and organizations to discuss issues of common concern. The interdisciplinary nature of the network has allowed its members to share the significant work carried out under the SWaRMA initiative, especially the

work related to gender and groundwater. The UIBN-AC has also helped prepare basin focused research proposals.

Since the establishment of the UIBN-AC, the number of members has been increasing and they have shown interest in continuing the network post-SWaRMA as a think-tank to support the government. For the sustainability of the UIBN-AC, a recent member, Afghanistan National Water and Environment Research Centre (ANWERC), has said it will support the NWARA, facilitate the country chapter meetings, and support the technical working groups with research and dissemination of findings.

A learning platform has been established to disseminate science- and evidence-based research findings in Afghanistan and beyond.

SECTION 4

Gender and inclusion

Afghanistan is among the nine Least Developed Countries (LDCs) in Asia and remains low on human development and gender equality indices. Difficult geographical terrain, degradation of natural resources and environmental conditions with growing water scarcity, political instability, internal conflict and economic insecurity make a dangerous combination for women's rights and empowerment. Disproportionate effects of armed conflict on women including strict gender segregation and the elimination of women from the public sphere is well documented globally and clearly visible in Afghanistan. While support for girls' education has improved, about 60% of the 3.7 million children out of school in Afghanistan are girls, and the rate of literacy among girls, at approximately 37%, is half that of boys (Asia Foundation, 2018).

According to the 2016–17 Afghanistan Living Conditions Survey, the national unemployment level currently stands at about 24%. The survey also showed that majority of the respondents (mostly men in rural areas) did not think women should be allowed to work outside the home. While the government is committed to women's equality and increased participation and representation of women at all levels of decision-making, institutionalization of these goals remains a challenge, including representation of women in government jobs and women's access to and involvement in decision making around important resources like water.

Gender integration strategy

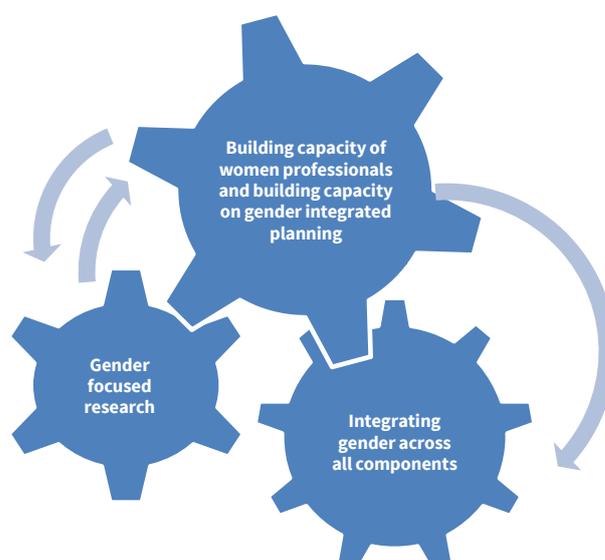
As end users of water, men and women have quite different interests and resources and cannot be treated the same. In many remote and rural areas of Afghanistan, socioeconomic factors have forced men to out-migrate, leaving women to take sole responsibility for farm work. Growing water scarcity in the absence of good governance has made women more vulnerable than ever. Careful development, use and management of water requires a gendered approach, particularly in times of water crisis like drought and flood. Afghanistan's 2009 Water Law grants everyone equal right to water, focusing on availability, accessibility, affordability, and safety for all.

For SWaRMA, it was important to break barriers and set new milestones by establishing women as role models in a technical field in a country with low female literacy and limited participation of women in the public sphere. In such a context, the participation of one woman in an event can be an achievement.

In this context, SWaRMA had a clear mandate to develop gender responsive institutions and information systems that can understand and respond to the demands of women as well as to involve women and advocate for the participation of women as users and decision makers. Building on ICIMOD's strategy for gender transformative change, SWaRMA applied a three-pronged approach for mainstreaming gender in its work (Figure 11).

FIGURE 11

ICIMOD'S THREE-PRONGED APPROACH FOR MAINSTREAMING GENDER



Integrating gender issues across all components: SWaRMA ensured that gender issues were well reflected in SWaRMA's objectives and outcomes and in the development, monitoring and evaluation of activities. Training packages like CBFEWS and IRBM included dedicated sessions on gender and social inclusion.

Gender-focused research to address knowledge and data gaps on gender-related vulnerabilities and inequalities: SWaRMA commissioned a Kabul University team from its Gender and Women's Studies Department to conduct a study to identify challenges, constraints and opportunities for gender and social inclusion in the policies, programmes, planning and practices of water resources management agencies in Afghanistan.

Capacity building of women professionals and of partners, decision-makers and producers of knowledge on gender analysis: Given the socio-cultural and political context of Afghanistan, success in engaging women professionals in capacity strengthening activities cannot be measured in quantitative terms. For SWaRMA it was important to break the barriers and set new milestones by establishing women as role models in a technical field in a country with very low female literacy and limited participation of women in public sphere. In such a context, participation of one woman can be a big achievement.

Therefore, conscious efforts were made to nominate women to participate in events like hydrological modelling and the UIBN-AC technical working groups. The session on gender equality and social inclusion in the integrated river basin management training certainly enhanced the sensitivity, awareness and understanding of the partners on these issues. Workshops on integrating gender in water resource management were conducted in Kabul. A workshop on gender research methodology and a write-shop for the KU professors and students were also conducted, and it is hoped that this will go a long way towards enhancing dialogue on gender and social inclusion. In particular, the involvement of the four students (two women and two men) in the trainings and research was seen as a long-term investment.

GESI research findings

SWaRMA supported a team (2F:4M) from KU's Gender and Women's Studies Department to conduct a research to identify possible gender gaps in laws, policies, and practices of the NWARA and MAIL. Research findings showed that the two ministries have made considerable efforts to ensure women's participation in water management through relevant policy changes as well as organizational changes such as the establishment of a gender department, hiring of women staff and providing them opportunities to participate in the planning processes. One of the biggest challenges is to translate the policies into action. The percentage of female employees in the NWARA is 6% and in the MAIL it is 4%, which is below the 30% recommended by the government. At the local level, due to lack of a clear action plan and strategy, women's participation in decisions related to water management remains limited. The policies lack clear provision for women's participation in local councils and associations, and traditional norms and customs in the villages bar women from attending councils that make decisions on water management.

To improve gender integration in water management in Afghanistan, the study suggested that the two ministries work closely with the Ministry of Women Affairs to identify institutional strategies to not just improve women's participation in local councils and institutions but also promote them to leadership positions. Strategies could include reserved seats for women in these councils. The study also recommended continued capacity building of the staff on gender integrated planning and gender analysis, and working closely with KU's Gender and Women's Studies Department to promote research on gender and water management.

Individual and institutional capacity enhancement

In order to assess the immediate impact of SWaRMA's efforts to strengthen the capacity of institutions and individuals, a capacity self-assessment and a tracer survey were conducted referring to the three key indicators: strategic and institutional support mechanism for water resources management; service provision that includes knowledge management, data access, service functions and gender integration; and networking and partnership. During the project period, more than 36 events were organized with 271 participants (~10% women).

Tracer survey

A tracer survey of individuals participating in various capacity enhancement events from May 2018 to July 2019 was conducted using specific questions related to increased knowledge, confidence and practice. The tracer study aimed to evaluate the relevance and effectiveness of SWaRMA training. The survey data provided valuable quantitative insight about trainees' knowledge and skills and how they would put them into practice to strengthen water resource management in Afghanistan.

The findings show that most of the trainings have enhanced knowledge and participants have put the knowledge into practice. Around 80% of the participants said that they are confident and able to use the knowledge independently (Figure 11). The survey responses revealed remarkable success in terms of knowledge, confidence and practice. Close to 95% reported that they have at least intermediate level knowledge of the subject introduced and 40% reported that they have upgraded their knowledge to an advanced level. 50% and above think that their knowledge has significantly increased in 25 out of the 35 areas rated.

The study also showed that 46% respondents are regularly using the knowledge they have gained in the training (refer to section 3). More than 50% responded that 11 sets of knowledge and skills they acquired (out of the 24 rated) are being used on a regular basis.

This represents the significance of training in terms of capacity building in water resource management in Afghanistan. Nonetheless, respondents have suggested follow-up trainings and more support for some modelling work and open data access.

Some of the key recommendations provided by the participants are:

- Some participants think there should be follow-up trainings, especially on technical subjects like J2000 modelling and glacier monitoring, which are new for them.
- The eSource is not open source software so participants recommended retaining a permanent account that can be used at all times, anywhere.
- More time suggested for the water allocation model
- More support required to identify PDGL in Afghanistan
- Participants thought the field visit helped them understand IRBM issues better.
- Gender training that focuses on practical aspects of gender equality would be more effective.

Capacity self-assessment

The capacity self-assessment also focused on the three primary objectives – capacity of SWaRMA partner institutions for providing strategic and institutional support for water resources management; service provision that includes knowledge management, data access, service functions and gender integration; and networking and partnership. The assessment presented here refers to the self-assessment that the organizations conducted to plan and implement water resources management in Afghanistan, specifically in the context of IRBM. A baseline for institutional capacity for water resources management was established.

The organizational capacity was rated on a scale of 1–4, where 1 = low; 2 = basic; 3 = moderate; and 4 = strong. The baseline and end line capacity self-

assessment was conducted in six institutions with a focus on the NWARA, MAIL and KU. The findings (Figure 12) show that the NWARA, MAIL and KU improved their capacity from baseline to end line; ANDMA and KPU were not involved in all the thematic areas as per their organizational mandate.

The findings of the capacity self-assessment showed that the training had improved the knowledge, confidence and practice in majority of the

thematic areas introduced in SWaRMA (Figure 13). Participants gained intermediate to advanced level knowledge and were already putting the knowledge to practice, e.g., during the benchmark glacier monitoring and J2000 hydrological modelling. The results varied across organizations depending on the level of support they received from the project and learning opportunities provided to them. However, there is room for improvement in a number of thematic areas.

FIGURE 12 TRACER SURVEY FINDINGS

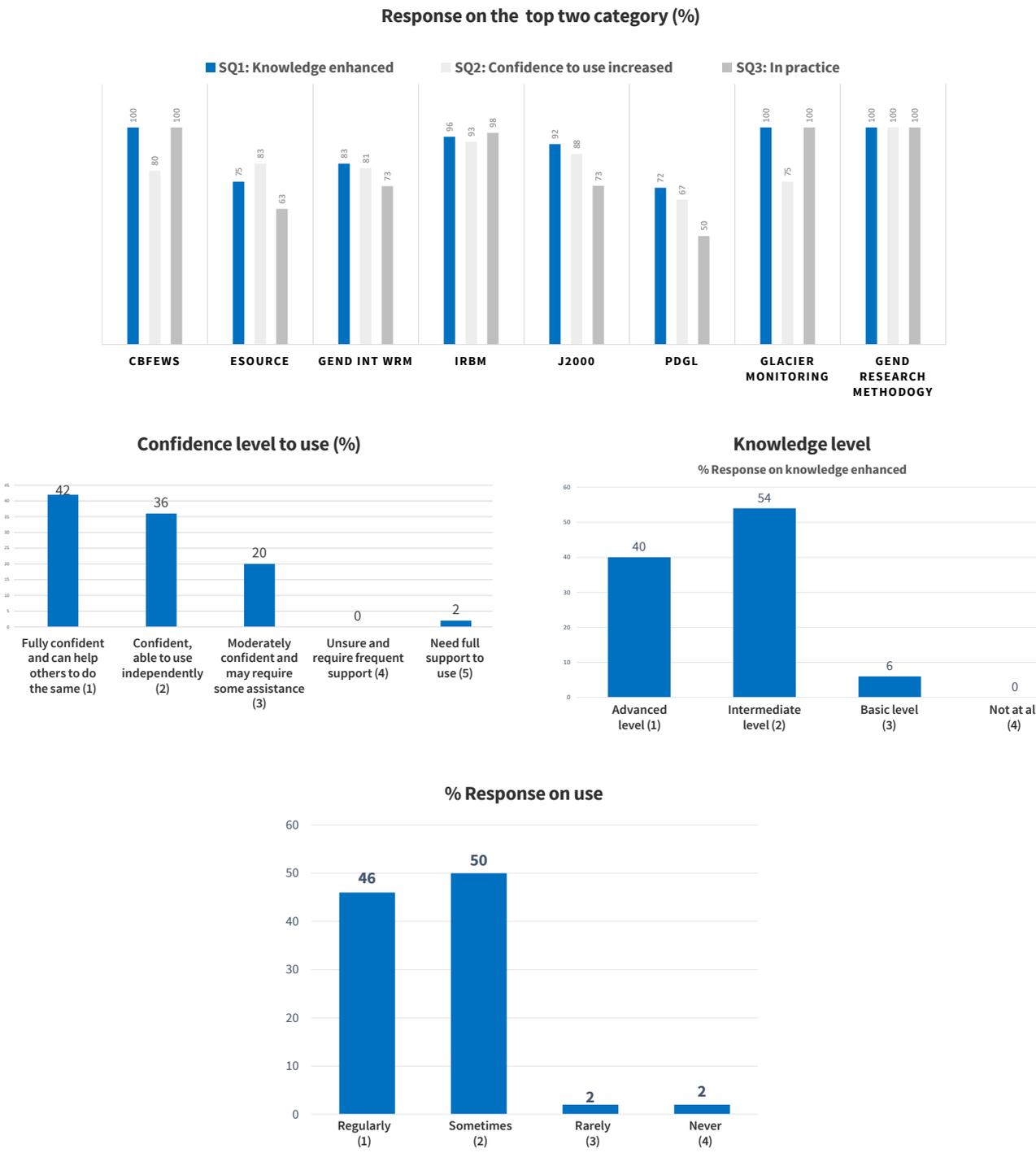
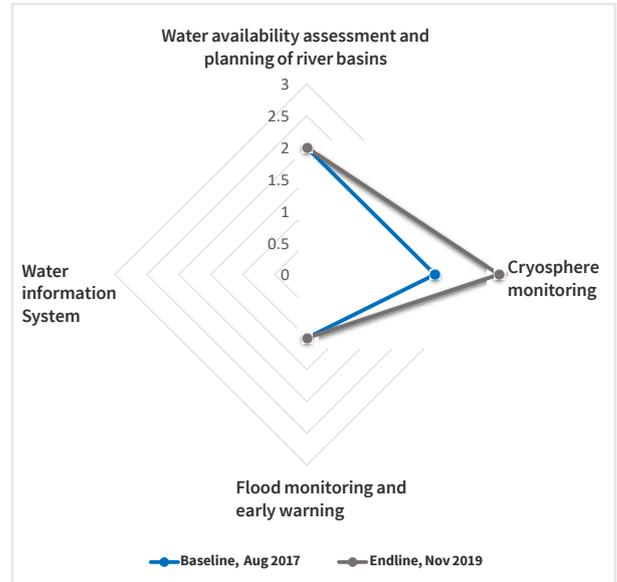
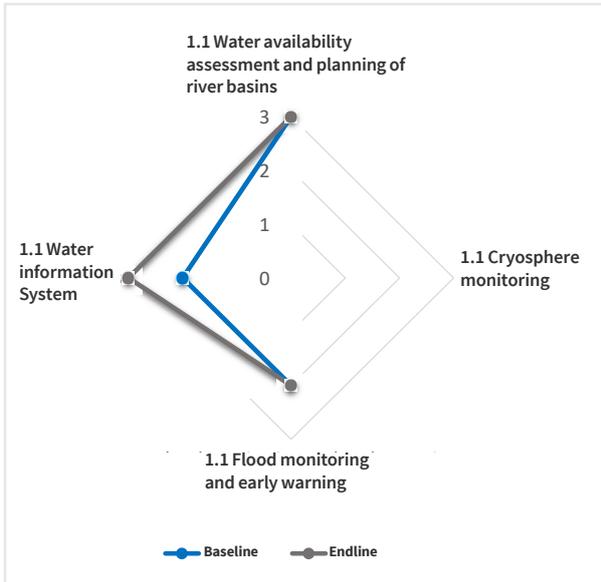
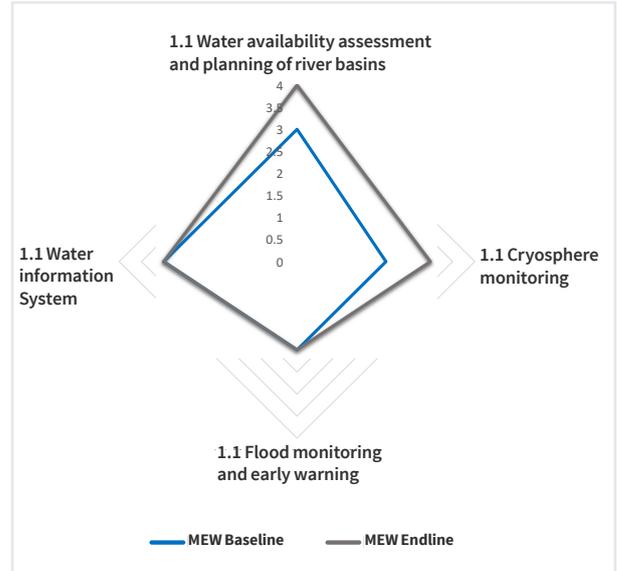
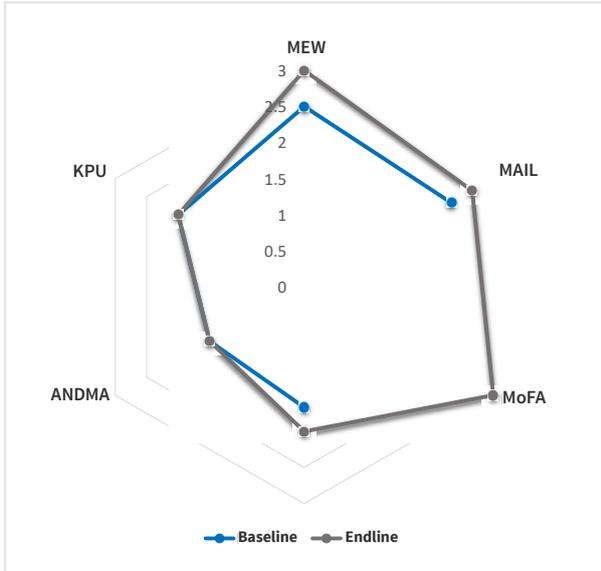


FIGURE 13

CAPACITY SELF-ASSESSMENT FINDINGS



SECTION 6

Challenges and lessons learnt

Despite its overall success, SWaRMA faced some administrative and technical challenges and learned lessons for addressing the challenges:

Administrative challenges

SECURITY SITUATION

From a security perspective, Afghanistan is under constant threat from anti-government elements and there is always a possibility of conflict.

VISA PROCESS

Bureaucratic procedures in Afghanistan delay the process of nomination and invitation of participants. Getting approval of participants from the ministry is also a difficult and time-consuming task. To reduce the risks associated with visas, the project started processing visas 1.5 months before the event date. Alternative venues for meetings/trainings were also identified given the volatile situation.

WOMEN'S PARTICIPATION

One of the biggest challenges for SWaRMA was to achieve 35–50% participation of women, particularly in its capacity building workshops. A further look at education data in Afghanistan shows that approximately 35% of young women are in secondary education (Council on Foreign Relations, 2018). Since SWaRMA was working with the Government of Afghanistan, finding women in technical and senior positions within the government and relevant nodal ministries was particularly difficult.

REMOTE PARTNERING

With partners working from Afghanistan, Australia and Nepal, especially when access to Afghanistan was a major challenge, the project had to conduct most activities remotely. Also, in the time of the COVID-19 pandemic, internet-based meetings and interactions were challenging due to poor connectivity in Afghanistan. ICIMOD's country office in Kabul and officials and interns based in the NWARA office facilitated the remote interactions.

FINANCIAL IMPLICATIONS

As some activities could not be carried out in Afghanistan due to the security situation, some major events were organized in other places like New Delhi, India and Dubai, UAE. This affected financial projections and fund utilization.

LIMITED TIMEFRAME

The limited timeframe of the project was a challenge since translating policies into practice requires institutional and procedural changes that take time. For example, the gender transformative change that SWaRMA aspired to was not possible within such a short time. Hence the project focused on strengthening needs assessment and research capacities for gender integration and gender integrated planning.

Technical challenges

TRANSBOUNDARY ASPECT

Given the delicate nature of transboundary water issues, it was challenging to ensure openness and consistency in data sharing and dialogues around the subject. Joining the science-based UIBN helped the project overcome this challenge. It provided an opportunity for cross-learning and sharing project findings.

TECHNOLOGY TRANSFER

Due to lack of access to internet, it was difficult to disseminate water level information in the community-based flood early warning system. The remoteness of the area and lack of human settlements also posed a challenge in transferring data collected from the telemetry-based system. Later, the system was successfully tested in collaboration with Roshan Telecom. However, the challenge will remain until internet services are available.

GENDER INTEGRATION

To promote gender responsive practices in the ministries, decision makers would need to be proactive about hiring and training women professionals in WRM and other linked sectors. The study carried out by KU enabled the partners to understand the need of gender-responsive strategies. The incorporation of gender into some of SWaRMA's modules also helped sensitize male professionals on the need of GESI.

Lessons learnt

MULTI-STAKEHOLDER PARTNERSHIP

The partners saw multi stakeholder partnership as a key approach for improving the engagement of institutions. It offers a strong collaborative model and space for innovation, and allows the integration of different sectors, leading to sustainable solutions and sound governance.

CO-CREATION AND CO-LEARNING OPPORTUNITIES

The concept of knowledge co-creation and co-learning added value to the project, ensuring joint ownership and sustainability of project activities. It also brought clarity about the roles and responsibilities of partners and provided opportunities for different ministries to work together and appreciate each other's competencies.

HIGH-LEVEL ENGAGEMENT FROM THE DESIGN PHASE

The project's partnership approach significantly contributed to the effective implementation and success of the project. This is mainly because all the partners felt that they were actively engaged not only in the implementation but also in the conceptualization and decision-making processes. The involvement of the deputy minister, who is also a member of the ICIMOD Board of Governors, and high-level government officials in all strategic meetings showed the commitment of the Afghan government and the smooth execution of the project.

Results-based outcomes

In a project like SWaRMA where major activities focused on capacity enhancement, results-based planning and outcome helped in achieving the goal of the project. Instead of holding one-off training sessions, the project conducted a series of interrelated events involving the same key participants. This helped enhance their capacity and build their confidence. It proved that strategic investment in the enhancement of skillsets and knowledge can be an asset to individuals, institutions, and the country at large.

GENDER INTEGRATION

Since gender integration is a long and time-consuming process, it is important to establish partnerships within the country to ensure the

process continues beyond the project timeframe. For example, KU's Gender Studies Department can be a significant partner of the NWARA and MAIL in research/need assessment studies.

PHYSICAL PRESENCE IN KABUL

ICIMOD's physical presence in Kabul and the placement of ICIMOD staff in the NWARA office helped in liaising and building rapport with key partners. The programme officer and interns of SWaRMA helped with day-to-day tasks and provided support and clarification as and when required.

SECTION 7

Future perspectives

SWaRMA has created a platform for bringing the Afghanistan government, Australian government, and international partners together to strengthen the capacity of Afghan partners working in water resources management in order to achieve SDG 6 and the partnership goals of SDG 17.

The project has set an excellent example of capacity enhancement at the institutional and individual level by envisioning and implementing various tools and models and achieving results-based outcomes. Afghan partners greatly appreciated the concept of multi-stakeholder partnership that guided the project. The roadmap for a water information system provided relevant ministries guidelines on data management and utilization. Most of the activities implemented through the project are already being scaled up in Afghanistan by the WRD/NWARA, and ICIMOD has committed long-term support for out scaling and up-scaling them in Afghanistan and other HKH countries. Lessons learned from SWaRMA are important for other projects, especially those focusing on capacity enhancement and knowledge sharing.

As SWaRMA prepares to phase out, below are some recommendations for a way forward:

1. Enriched knowledge and skills of Afghan water professionals for the implementation of multi-scale IRBM: As the Government of Afghanistan adopts the concept of IRBM in Afghanistan's river basins, the capacities, skills, and knowledge of water professionals need to be enhanced at various levels – watershed, sub-

basin, and basin. The knowledge introduced by SWaRMA in hydrological modelling, benchmark glacier monitoring, flood monitoring, water information systems, and the multi-scale IRBM approach needs to be scaled up and scaled out by developing in-house experts. Some specific immediate actions could be:

- 1.1 Out-scale water assessment and climate change scenario tools by providing a Training of Trainers (ToT) and integrate the tools in the National Water Affairs Regulation Authority (NWARA)'s system. Provide support to integrate these tools in university curricula for wider knowledge dissemination and use in the future.
 - 1.2 Provide technical support to the partners to out-scale the long-term cryosphere monitoring system to the selected benchmark glaciers and link it with a global forum for knowledge sharing and learning opportunities (e.g., World Glacier Monitoring Service).
 - 1.3 Ensure systematic monitoring of water level by using a telemetry-based system and provide hands-on training to the local resource person/s from partner organizations for out-scaling.
 - 1.4 Provide technical advice and training to Afghan government experts to implement multi-scale IRBM in the Kabul basin taking a gender perspective into account.
2. Increased and active engagement of the Afghan community of practitioners for regional level forums: In order to foster coordination among researchers in the field of water resources management in Afghanistan and beyond, it is important to increase their engagement in science-based forums at the national, regional, and global level. Such forums can provide them an opportunity to share their knowledge and experiences related to climate impacts on

water resources and the cryosphere, upstream/ downstream linkages, hazards, vulnerability, and adaptation, and integration of gender aspects. Some specific immediate actions could be:

- 2.1 Support the UIBN-AC to foster coordination among researchers working in the region through the Regional UIBN and other regional and global forums.
 - 2.2 Support the UIBN-AC to foster coordination for research on climate, cryosphere, water, hazards, vulnerability and adaptation, and integration of gender aspects.
3. Enhanced capacity of women professionals and of partners, decision-makers and producers of knowledge on gender integration: Given the socio-cultural and political context of Afghanistan, success in engaging women professionals in capacity strengthening activities cannot be measured in quantitative terms. Transforming complex organizations and societies and challenging entrenched norms and power relations takes time. Some specific immediate actions could be:
- 3.1 Engage women professionals in capacity building activities related to water resources management.
 - 3.2 Support the government in designing programme/project concepts and tools for gender analysis and comprehensive gender responsive planning and decision making.

The project will build the capacity of relevant individuals and government line agencies so that they can become in-house experts and continue the project activities beyond the project period. The existing SWaRMA Steering Committee and Technical Coordination Committee (from phase I) continue to work with Afghan government partners, donor agencies and other likeminded international organizations to achieve Afghanistan's commitment to 2030 SDGs.

Annexes

ANNEX 1

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ANNEX 2

Financial status

The financial status of the DFAT's support to SWARMA as of 30th June 2020 is provided below. At the end of the project, the unspent balance of fund is AUD 15,641.59. The unspent balance of fund is mainly because of cancellation of two trainings, planned for Afghan participants in April 2020 in Kathmandu, due to COVID-19 pandemic.

Description	USD	AUD
Total committed fund in AUD		2,000,000.00
Actual Income received	1,457,338.82	2,000,000.00
Actual expenses	1,445,941.27	1,984,358.41
Balance of fund	11,397.55	15,641.59

ANNEX 3

Knowledge products

S.N.	Title
1	Proceedings of the Inception Workshop, 9–11 March 2018, New Delhi, India; ICIMOD Proceedings 2018/1 https://lib.icimod.org/record/33899
2	Afghanistan Side Event during the Upper Indus Basin Network Workshop for Enhancing Science-Based Regional Cooperation, 23 April 2018; ICIMOD Proceedings 2018/2 https://lib.icimod.org/record/33900
3	Proceedings of the Third Regional Hands-on Training on Community Based Flood Early Warning System, 14–18 May 2018, Lalitpur, Nepal; ICIMOD Proceedings 2018/3 https://lib.icimod.org/record/33902
4	Proceedings of the First Steering Committee Meeting, Technical Coordination Committee Meeting, Understanding of Partnership Modality, Theory of Change and Performance Indicators, 26–28 July 2018, Kathmandu, Nepal https://lib.icimod.org/record/34479
5	Upper Indus Basin Network – Afghanistan Chapter. ICIMOD Workshop Report 2018 (26–27 Oct 2018) https://lib.icimod.org/record/34487
6	Proceedings of the Third Upper Indus Basin Network – Afghanistan Chapter Meeting; Strengthening Water Resources Management in Afghanistan (SWaRMA), 17–18 January 2019, Kathmandu, Nepal https://lib.icimod.org/record/34568
7	Multi-scale Integrated River Basin Management from a Hindu Kush Himalayan Perspective; Resource Book https://lib.icimod.org/record/34656
8	Proceedings of the Second Steering Committee Meeting and Technical Coordination Committee Meeting [of the] Strengthening Water Resources Management in Afghanistan (SWaRMA), 5–6 April 2019, Dubai, United Arab Emirates https://lib.icimod.org/record/34687
9	Fourth Regional Hands-on Training on Community Based Flood Early Warning System; Proceedings https://lib.icimod.org/record/34644
10	SWaRMA Flyer https://lib.icimod.org/record/34477
11	SWaRMA Poster https://lib.icimod.org/record/33901
12	Governance Framework – UIBN- Afghanistan Chapter https://lib.icimod.org/record/34488
13	CBFEWS: The Story from Then to Now https://lib.icimod.org/record/34317
14	CBFEWS Manual – Revised Edition for Telemetry-based Instrumentation https://lib.icimod.org/record/34493
15	Proceedings of the Workshop on Gender Integrated Planning in Water Resources Management in Afghanistan, 10–13 March 2019, Kabul, Afghanistan https://lib.icimod.org/reco
16	Proceedings of the Training on the Impact of Climate Change on the Kabul River Basin using the JAMS/J2000 Modelling System, 6–16 November 2019, Kathmandu, Nepal https://lib.icimod.org/r
17	Revisiting J2000 Model application in Afghanistan”: a confab for refreshing the understanding of the hydrological modelling https://lib.icimod.org/record/34821
18	Proceedings of the workshop on gender integrated planning in water resources management in Afghanistan 10–13 March 2019 Kabul, Afghanistan https://lib.icimod.org/re
19	Establishing Pir-Yakh Glacier as a benchmark glacier in Kabul basin, Afghanistan, November 2019 https://lib.icimod.org/record/34820

20	Glacier Monitoring Equipment Handover to MEW https://www.icimod.org/wp-content/uploads/2020/06/Handover-Document_Glacier-Monitoring-Eqpt_MEW.pdf
21	Multiscale Integrated River Basin Management (IRBM) Resource Book https://lib.icimod.org/record/34656
22	Training Workshop on Multiscale Integrated River Basin Management (IRBM) from the Hindu Kush Himalayan Perspective (in press)
23	Application of the J2000 Hydrological Model in the Panjshir catchment of the Hindu Kush Himalayan Region, Training Manual https://lib.icimod.org/record/34858
24	River Basin Modelling Workshop - AFN (in press)
25	Refresher Training on field-based benchmark glacier monitoring (in press)
26	Training on identification of potentially dangerous glacial lakes using remote sensing and geospatial techniques (in press)
27	Interview with Professor Hedayatullah Arian https://www.icimod.org/initiative/hkh-cryohub-spotlight-hedayatullah-arian/
28	Blog - Monitoring Pir-Yakh Glacier and setting up hydro-meteorological stations https://www.icimod.org/article/monitoring-pir-yakh-glacier-and-setting-up-hydro-meteorological-stations/

ANNEX 4 Events

PMU WORKSHOP

S.N.	Title	Start Date	End Date
1	Inception Workshop - Water Resources Management in Afghanistan (WRM-A)	09-03-18	11-03-18
2	SWaRMA 1st Steering Committee Meeting & Technical Coordination Committee Meeting	26-07-18	28-03-19
3	SWaRMA Second Technical Coordination Committee Meeting	05-04-19	05-04-19
4	SWaRMA Second Strategic Committee Meeting	06-04-19	06-04-19
5	Workshop on Gender Integrated Planning in Water Resource Management	10-03-19	13-03-19
6	Workshop on Gender Research Methodology and Tools for Study	14-03-19	15-03-19
7	Writeshop on Gender Research	23-06-19	24-06-19
8	3rd Technical Coordination Committee Meeting	20-11-19	20-11-19
9	SWaRMA's Partnership Meeting and Theory of Change Meeting	21-11-19	21-11-19
10	3rd Strategic Committee Meeting	22-11-19	22-11-19
11	DFAT-funded SWaRMA Project Closing Meeting	30-06-20	30-06-20

THEMATIC AREA WORKSHOPS

TA-1: Water Availability Analysis

S.N.	Title	Start Date	End Date
1	Training Workshop on Hydrological Modelling using Jams/ J2000	25-10-18	04-11-18
2	On-the-Job Training on J2000 Modelling of Kabul Sub-basin	01-04-19	31-05-19
3	Revisit J2000 Modelling in Kabul River Basin	20-08-19	22-08-19
4	River Basin Modelling Workshop - AFN	17-09-19	17-09-19
5	Training on Impact of Climate Change on Kabul River Basin using the JAMS / J2000 Modelling System	06-11-19	16-11-19
6	Virtual WebHRU online meeting	29-06-20	29-06-20

TA-2: CRYOSPHERE MONITORING

S.N.	Title	Start Date	End Date
1	Refresher Training on Field-based Benchmark Glacier Monitoring	09-07-19	13-07-19
2	Training on Identification of Potentially Dangerous Glacial Lakes using Remote Sensing and Geospatial Techniques	15-07-19	19-07-19
3	PirYakh Glacier Monitoring Expedition	06-08-19	14-08-19
4	Glacier Monitoring Equipment Handover to NWARA	22-11-19	22-11-19

TA-3: FLOOD MONITORING AND EARLY WARNING

S.N.	Title	Start Date	End Date
1	Third Regional Hands-On Training on CBFEWS	14-05-18	18-05-18
2	Fourth Regional Hands-on Training on Community Based Flood Early Warning System (CBFEWS)	15-04-19	19-04-19

TA-4: INTEGRATED WATER RESOURCES MANAGEMENT

S.N.	Title	Start Date	End Date
1	Training Workshop on Multi-scale Integrated River Basin Management (IRBM) from the Hindu Kush Himalayan Perspective	28-01-19	08-02-19

TA-5: WATER RESOURCES ASSESSMENT AT BASIN SCALE

S.N.	Title	Start Date	End Date
1	Source Modelling Training Workshop	22-01-19	26-01-19
2	Training on Hydrological Modelling using eWater Source	25-08-19	29-08-19

TA-6: WATER INFORMATION SYSTEM

S.N.	Title	Start Date	End Date
1	1st WIS Meeting - Scoping Requirements for a National Water Information System, Technical Experts' Meeting	19-01-19	20-01-19
2	2nd WIS Meeting - Meeting of Technical Experts to develop the National Water Information System for a Roadmap for Afghanistan	07-04-19	07-04-19
3	3rd WIS meeting - Developing a roadmap for a National Water Information System (WIS) for Afghanistan - Technical experts' meeting	11-06-19	13-06-19

TA-7: REGIONAL COOPERATION

S.N.	Title	Start Date	End Date
1	UIB-N Workshop for Enhancing Science Based Regional Cooperation, 1st UIBN Afghanistan Side Event	23-04-18	23-04-18
2	1st UIBN Afghanistan Chapter Meeting	26-10-18	27-10-18
3	2nd UIBN AC Meeting	22-12-18	22-12-18
4	3rd UIBN-AC Meeting	17-01-19	18-01-19
5	4th UIBN AC Meeting	15-07-19	15-07-19
6	5th UIBN-AC Meeting	19-11-19	19-11-19
7	6th UIBN-AC Meeting	23-02-20	23-02-20
8	7th UIBN-AC Meeting	22-06-20	22-06-20

ANNEX 5

Governance mechanism

SWaRMA Steering Committee Members

Co-Chair:
Highest-ranking representative (Government of Afghanistan)

Co-Chair:
Director General, ICIMOD (or his nominee)

Secretary:
Programme Coordinator, SWaRMA (ICIMOD)/ RPM River Basins and Cryosphere (ICIMOD)

Members:
Representatives from MoFA, MAIL, MEW, academic institution (KU or KPU), Government of Australia, CSIRO, ICIMOD

Secretariat: ICIMOD headquarters, Kathmandu, Nepal

SWaRMA Technical Coordination Committee Members

Co-Chair:
Representative from MEW

Co-Chair:
RPM River Basins and Cryosphere (ICIMOD)

Secretary:
Programme Coordinator-SWaRMA

Members:
Technical experts from MoFA, MAIL, MEW, ANDMA, NEPA, Kabul University, Kabul Polytechnic University, Government of Australia, CSIRO, ICIMOD, experts from international resource centres, and academic institutions within and outside the region.

Observers:
Invited as and when required upon agreement with TCC

Secretariat:
ICIMOD headquarters, Kathmandu, Nepal

SWaRMA Programme Management Unit

Regional Programme Manager, River Basins and Cryosphere (ICIMOD)

Programme Coordinator/SWaRMA

Programme Officer/SWaRMA

Programme Associate/SWaRMA

ANNEX 6**Project team****SWaRMA thematic and crosscutting area team members**

S.N.	Theme	Lead	Technical Team
1	Water Availability Analysis	Santosh Nepal	Tayib Bromand, Kabi Raj Khatiwada, Saurav Pradhananga, Milad Dildar, Najeebullah Jamal, Farangis Rassouly
2	Cryosphere Monitoring	Anna Sinisalo	Hedayatullah Arian, Sharad Joshi, Tika Ram Gurung, Milad Dildar
3	Flood Monitoring and Early Warning	Neera Shrestha Pradhan	Vijay Khadgi, Shailendra Shakya, Dipankar Shakya, Narendra Bajracharya, Pradeep Dangol, Ali Nazar Nazari, Nawid Ahmad Rahguzar
4	Integrated River Basin Management	Santosh Nepal, Arun B Shrestha, Chanda Gurung Goodrich, Arabinda Mishra, Anjal Prakash, Sanjeev Bhuchar, Vijay Khadgi, Laurie Ann Vasily, Neera Shrestha Pradhan	Ramesh Ananda Vaidya, Philippus Wester, Kabi Raj Khatiwada, Aditya Bastola, Nisha Wagle, Sudip Pradhan, Faisal Mueen Qamar, Saurav Pradhananga, Aditya Bastola, Avash Pandey, Finu Shrestha, Sharad Joshi, Anna Sinisalo, Mandira Shrestha, Dipankar Shakya, Madhav Dhakal, Gunanidhi Pokhrel, Karishma Khadka, Samden Sherpa, Udayan Mishra, Debabrat Sukla, Nargis Mansoor, Samuel Thomas, Shahriar Wahid, Susan Cuddy, Andrew Johnson
5	Water Resources Assessment at Basin Scale	Shahriar Wahid	Susan Cuddy, Peter Taylor
6	Water Information System	Peter Taylor	Tayib Bromand, Susan Cuddy, Shahriar Wahid
7	Regional Cooperation	Arun Bhakta Shrestha	Madhav Dhakal
8	Crosscutting Unit		Farid Ahmad, Chanda Gurung, Suman Bisht, Aditya Bastola, Lalu Kandel, Santosh Pathak, Ghulam Shah
9	Program Management Unit		Arun B Shrestha, Neera Shrestha Pradhan, Ayub Shinwari, Indu Chitrakar, Nargis Mansoor, Jawid Ahmad Jawid



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