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ADAPTATION FUND BOARD SECRETARIAT TECHNICAL REVIEW OF PROJECT/PROGRAMME PROPOSAL

PROJECT/PROGRAMME CATEGORY: Regular Size Full Proposal

Country/Region: Pakistan
Project Title: Sustainable Actions for Ecosystems Restoration in Pakistan (SAFER Pakistan)
Thematic Focal Area: Multi-Sector Project
Implementing Entity: International Centre for Integrated Mountain Development (ICIMOD)
Executing Entities: International Centre for Integrated Mountain Development (ICIMOD); United Nations Children's Fund (UNICEF) Pakistan; United Nations Entity for Gender Equality and the Empowerment of Women (UN Women);
AF Project ID: AF00000348
IE Project ID:
Requested Financing from Adaptation Fund (US Dollars): 10,000,000
Reviewer and contact person: Ahmad Ghosn
Co-reviewer(s):
IE Contact Person:

Technical Summary	The project "Sustainable Actions for Ecosystems Restoration in Pakistan (SAFER Pakistan)" aims to reduce the vulnerability and increase the adaptive capacity of the population residing in Pakistan's Indus Basin to the impacts of climate change. This will be done through the six components below: Component 1: Cryosphere Disaster Risk Reduction (USD 1,858,159) Component 2: Springs revival (USD 998,526) Component 3: Groundwater Management and Resilient Community Water Supply (USD 2,308,000) Component 4: Ecosystem-Based Adaptation (USD 700,000) Component 5: Surface water conservation (USD 1,080,000) Component 6: Adaptive capacities and empowered communities for strengthened resilience to climate change (USD 1,681,000). Requested financing overview: Project/Programme Execution Cost: USD 590,905 Total Project/Programme Cost: USD 9,216,590 Implementing Fee: USD 783,410 Financing Requested: USD 10,000,000

	The second technical review raises several issues, including: i) reflecting the USPs in the ESMP; ii) discussing the project environmental, social and economic benefits; iii) specifying project results framework and compliance with AF results framework quantitative targets/ indicators; and iv) providing a summary of related projects and complementarities/ lessons learned at relevant section of the proposal document; among others as discussed in the Clarification Requests (CRs) and Corrective Action Request (CARs) raised in the review.
Date:	**8 July 2024**

Review Criteria	**Questions**	**Comments**	**IE's Response**
Country Eligibility	1. Is the country party to the Kyoto Protocol or the Paris Agreement?	**Yes.**	
	2. Is the country a developing country particularly vulnerable to the adverse effects of climate change?	**Yes.** Pakistan is subject to climate change risks/ impacts including heatwaves, droughts, floods, erratic extreme weather events/ rainfall patterns, etc. (see Part I, pp. 2-8).	
Project Eligibility	1. Has the designated government authority for the Adaptation Fund endorsed the project/programme?	**Yes.** As per the Endorsement letter dated 12 April 2023.	
	2. Does the length of the proposal amount to no more than One hundred (100) pages for the fully-developed project document, and one hundred (100) pages for its annexes?	**Yes.** **CR1:** Include table of contents, lists of figures, tables, and acronyms/ abbreviations (ensure all abbreviations are spelled out when first used in the document). **CR2:** Another round of proofreading is recommended to fix some typos, minor grammar errors, etc. Also, Annex 1 "Theory of Change" is not legible (please revise).	Added. Done. Annex 1 also provided as JPEG separately.

Review Criteria	Questions	Comments	IE's Response
	3. Does the project / programme support concrete adaptation actions to assist the country in addressing adaptive capacity to the adverse effects of climate change and build in climate resilience?	**Yes.** Concrete activities include i) construction of groundwater recharge facilities; ii) establishment of climate-smart resilient water supply infrastructures; iii) demonstration of NbS sewage treatment via construction of wetlands; iv) rehabilitation of waterways/ponds and installation of water quality monitoring and management structures; v) capacity building of key stakeholders/ beneficiaries on climate adaptation, mitigation and community-led adaptation solutions; among others as described in Parts IC (pp. 10-11) and IIA (pp. 12-29). <u>However,</u> the objective is too lengthy. Also, further clarification of the potential risks/ impacts of the indicated USPs (small-scale watershed management and recharge activities under Outputs 2.2, 3.2, 4.2 and 5.2). Moreover, these USPs need to be included in the ESMP along with related measures.	
		CR3: Objective is too lengthy. If possible, please revise to read: "to reduce the vulnerability and increase the adaptive capacity of the population residing in Pakistan's Indus Basin to the impacts of climate change".	Revised.
		CR4: Revise Table 1 title to read "Project Components and Financing". Also, include total cost of each component.	Done.

Review Criteria	Questions	Comments	IE's Response
		CAR1: Mention the USPs in the ESMP along with provisions and responsibilities for assessment and management of associated risks/ impacts. Also, ensure consistency in describing their magnitude (Part III.C.1, p. 60, states: "they will not result in significant risks/ impacts", while Part IIK, p. 49, refers to "adverse impacts").	Added USP related provisions and responsibilities in ESMF and corrected the description of impacts.
	4. Does the project / programme provide economic, social and environmental benefits, particularly to vulnerable communities, including gender considerations, while avoiding or mitigating negative impacts, in compliance with the Environmental and Social Policy and Gender Policy of the Fund?	**Not fully addressed.** Part IIB (pp. 29-35) only includes statistics on the beneficiaries. This section needs to reflect the project overall economic, social and environmental benefits with due consideration to vulnerable groups/ gender aspects. **CAR2:** Besides the presented statistics on the beneficiaries, please include the project benefits under dedicated standalone titles (i.e.: economic, social, and environmental).	Relevant subsections (Part IIB.1, IIB.2 and IIB.3) on economic, social, and environmental benefits added.
	5. Is the project / programme cost effective?	**Yes.** See Part IIC (pp. 35-38) for related discussions	
	6. Is the project / programme consistent with national or sub-national sustainable development strategies, national or sub-national development plans, poverty reduction strategies, national communications and adaptation programs of	**Yes.** See Part IID (pp. 38-40) for related information.	

Review Criteria	Questions	Comments	IE's Response
	action and other relevant instruments?		
	7. Does the project / programme meet the relevant national technical standards, where applicable, in compliance with the Environmental and Social Policy of the Fund?	**Yes.** See Part IIE (pp. 40-42) for related details.	
	8. Is there duplication of project / programme with other funding sources?	**No.** See Part IIF (p.42-43) and Annex 10 (pp. 161-164) for related details. However, it is recommended to include in Part IIF a concise summary of related ongoing/ completed projects mentioned in Annex 10, including projects titles, date/s, and a concise brief of complementarities/ lessons learned. **CAR3:** Include in Part IIF a tabulated summary of Annex 10 ongoing/ completed related projects including title, date/s, and brief discussion of complementarities and lessons learned.	Tabulated summary (Table 7) added to Part IIF.
	9. Does the project / programme have a learning and knowledge management component to capture and feedback lessons?	**Yes.** See Part IIG (p. 43) and Annex 11 (pp. 165-169) for related details. Learning and knowledge management will be an integral part of Components 4 and 6.	
	10. Has a consultative process taken place, and has it involved all key stakeholders, and vulnerable groups, including gender	**Yes.** See Part IIH (pp. 43-44), Annex 12 (pp.170-177) and Annex 13 (pp. 178-182).	

Review Criteria	Questions	Comments	IE's Response
	considerations in compliance with the Environmental and Social Policy and Gender Policy of the Fund?	**CR5:** Provide brief discussion (1-2 paragraphs) on the number of consulted stakeholders/ communities and highlight gender aspects (number/ percent of women, etc.) where possible.	Added.
	11. Is the requested financing justified on the basis of full cost of adaptation reasoning?	**Yes.** As described in Part II"I" (pp. 44-47).	
	12. Is the project / program aligned with AF's results framework?	**Yes.** As described Part IB, p.8, the project is aligned with AF Outcomes 1,2,3,4,5, 7, and 8.	
	13. Has the sustainability of the project/programme outcomes been taken into account when designing the project?	**Yes.** See Part IIJ (pp. 47-48) and Annex 14 (pp. 183-185).	
	14. Does the project / programme provide an overview of environmental and social impacts / risks identified, in compliance with the Environmental and Social Policy and Gender Policy of the Fund?	**Yes.** See Part IIK (pp. 48-52), Annex 3 "E&S Impact Analysis and Management Planning" (pp. 110-121) and Annex 4 "Grievance Redressal Mechanism" (pp. 122-125). See CAR1 above regarding inclusion of USPs in ESMP.	
Resource Availability	1. Is the requested project / programme funding within the cap of the country?	**Yes.**	
	2. Is the Implementing Entity Management Fee at or below 8.5 per cent of the total project/programme budget before the fee?	**Yes.** The IE. Fee (USD 783,410) is 8.5% of the project total cost (USD 9,216,590). See Part IC Table 1 (pp.10-11) and Part IIIG (pp. 77-97).	

Review Criteria	Questions	Comments	IE's Response
	3. Are the Project/Programme Execution Costs at or below 9.5 per cent of the total project/programme budget (including the fee)?	**Yes.** The execution costs (USD 590,905) are 6.4% of the total project cost (USD 9,216,590). See Part IC Table 1 (pp. 10-11) and Part IIIG (pp. 77-97).	
Eligibility of IE	1. Is the project/programme submitted through an eligible Implementing Entity that has been accredited by the Board?	**Yes.**	
Implementation Arrangements	1. Is there adequate arrangement for project / programme management, in compliance with the Gender Policy of the Fund?	**Yes.** See Part IIIA (pp. 53-57) for related details.	
	2. Are there measures for financial and project/programme risk management?	**Yes.** See Part IIIB (pp. 57-59).	
	3. Are there measures in place for the management of for environmental and social risks, in line with the Environmental and Social Policy and Gender Policy of the Fund?	**Yes.** See Part IIIC, pp. 60-63), Annex 3 "E&S Impact Analysis and Management Planning" (pp. 110-121) and Annex 4 "Grievance Redressal Mechanism" (pp. 122-125). See CAR1 above regarding inclusion of USPs in the ESMP.	
	4. Is a budget on the Implementing Entity Management Fee use included?	**Yes.** See Part IIIG subsection G3, p. 97. **CR6:** Please include Table number in Part III.G3. Same applies to Part III.G2 and Part III.G1,	Done.

Review Criteria	Questions	Comments	IE's Response
	5. Is an explanation and a breakdown of the execution costs included?	**Yes.** See Part IIIG subsection G2, pp. 96-97.	
	6. Is a detailed budget including budget notes included?	**Yes.** See Part IIIG (pp. 77-97). **CR7:** Please indicate the components of the outcomes mentioned in G1 table.	Done.
	7. Are arrangements for monitoring and evaluation clearly defined, including budgeted M&E plans and sex-disaggregated data, targets and indicators, in compliance with the Gender Policy of the Fund?	**Yes.** See Part IIID (pp. 62-66).	
	8. Does the M&E Framework include a break-down of how implementing entity IE fees will be utilized in the supervision of the M&E function?	**Yes.** See Part IIID (pp. 62-66).	
	9. Does the project/programme's results framework align with the AF's results framework? Does it include at least one core outcome indicator from the Fund's results framework?	**Largely.** See Part IIIE (pp. 67-77). <u>However,</u> Indicators/ targets are neither quantified nor gender disaggregated. **CAR4:** Please quantify, as applicable, the mentioned indicators/targets in tables 10, 11 and 12 (i.e., provide indicator/ target numbers, percent of women, etc.). At table 12 please separate out the costs for each fund output and indicator. For example, output 1.2 should have a corresponding grant amount of X$ but	Changes made in Table 12, 13 and 14 as required. Gender disaggregation in the indicators has been further enhanced. The indicators now reflect quantitative values, with exact numbers to be provided based on the baseline assessment conducted at

Review Criteria	Questions	Comments	IE's Response
		should not be lumped with output 3.1 costs. **CR8:** In Part IIIE "Results Framework", include Table number and delete list of activities under INPUTS (pp. 70-73). Also, indicate the mentioned indicators (column 2 of the table) related AF outcome/s (Note: project results framework should include milestones, targets and indicators, including one or more core outcome indicators of the AF Results Framework, and in compliance with the Gender Policy of the AF-See proposal document template Part IIIE description).	the inception stage, as outlined in the M&E plan (Table 11). Done.
	10. Is a disbursement schedule with time-bound milestones included?	**Yes.**	

FULLY DEVELOPED PROPOSAL FOR SINGLE COUNTRY

PART I: PROJECT INFORMATION

Title of Project:	Sustainable Actions for Ecosystems Restoration in Pakistan (SAFER Pakistan)
Country:	Pakistan
Thematic Focal Area:	Multi-Sector Project
Type of Implementing Entity:	Regional Implementing Entity
Implementing Entity:	International Centre for Integrated Mountain Development (ICIMOD)
Executing Entities:	ICIMOD, United Nations Children's Fund (UNICEF) Pakistan; and United Nations Entity for Gender Equality & the Empowerment of Women (UN Women) Pakistan
Amount of Financing Requested:	US$10,000,000 (in US Dollars Equivalent)
Letter of Endorsement (LOE) signed:	Yes ☒ No ☐

NOTE: The LOE should be signed by the Designated Authority (DA). The signatory DA must be on file with the Adaptation Fund. To find the DA currently on file check this page: https://www.adaptation-fund.org/apply-funding/designated-authorities

Stage of Submission:

☒ This proposal has been submitted before including at a different stage (concept, fully-developed proposal)
☐ This is the first submission ever of the proposal at any stage

In case of a resubmission, please indicate the last submission date: 6/25/2024

Please note that fully developed proposal documents should not exceed 100 pages for the main document, and 100 pages for the annexes.

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Abbreviations and acronyms

4RF	Resilient Recovery, Rehabilitation, and Reconstruction Framework
AF	Adaptation Fund
AKAH	Aga Khan Agency for Habitat
BoQ	bill of quantities
CB-MEWS	community-based monitoring and early warning systems
CCA	climate change adaptation
ccGAP	Climate Change Gender Action Plan
CEDAW	Convention on the Elimination of All Forms of Discrimination Against Women
CGPI	Clean Green Pakistan Index
CNA	capacity needs assessments
DRM	disaster risk management
DRR	disaster risk reduction
E&S	environmental and social
EbA	ecosystem based adaptation
ESIA	environmental and social impact assessment
ESMP	environmental and social management plan
ESP	Environment and Social Policy [of Adaptation Fund]
GB	Gilgit-Baltistan
GCF	Green Climate Fund
GCISC	Global Change Impacts Studies Centre, Pakistan
GESI	gender equality and social inclusion
GIS	geographical information system
GLOF	glacial lake outburst flood
GPS	global positioning system
HVRAs	hazard vulnerability and risk assessments
IBIS	Indus Basin Irrigation System
ICIMOD	International Centre for Integrated Mountain Development
IWT	Indus Waters Treaty
KM	knowledge management
KP	Khyber Pakhtunkhwa
MGPO	Mountain and Glaciers Protection Organisation
MoCC&EC	Ministry of Climate Change and Environmental Coordination
MoWR	Ministry of Water Resources
NAP	National Adaptation Plan
NARC	National Agriculture Research Centre
NbS	Nature-based Solutions
NDMA	National Disaster Management Authority
O&M	operation and maintenance
PARC	Pakistan Agricultural Research Council
PCRWR	Pakistan Council on Research in Water Recourses
PDNA	post-disaster needs assessment
PHED	Public Health Engineering Department
PMD	Pakistan Meteorological Department
PPP	Public-Private Partnership

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RNA	rapid needs assessment
SAFER	Sustainable Actions for Ecosystems Restoration
SDG	Sustainable Development Goal
SOP	standard operating procedure
UIBN	Upper Indus Basin Network
UN Women	United Nations Entity for Gender Equality and the Empowerment of Women
UNICEF	United Nations Children's Fund
US$	United States Dollars
USPs	unidentified sub-projects
WASH	water, sanitation and hygiene

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A. Project Background and Context

A.1. General Context

Pakistan is one of the world's most climate-impacted countries, ranked eighth in GermanWatch's Long-Term Climate Risk Index 2021. The South Asian country grapples with recurrent climate-induced crises, including heatwaves, droughts, floods, and food shortages. The pressing imperative for Pakistan lies in enhancing adaptive capacity, resilience, and reducing vulnerability against these shocks. The Indus River is central to this challenge, playing a pivotal role in South Asian economies. To address this, **the Sustainable Actions for Ecosystems Restoration in Pakistan (SAFER Pakistan) project aims to reduce the vulnerability and increase the adaptive capacity of the population residing in Pakistan's Indus Basin to the impacts of climate change.** It will do this by enhancing community and institutional capacity in six key areas including response to cryosphere hazards, sustainable management of springs, groundwater, surface water, ecosystem-based adaptation and community resilience to climate change.

Indus Basin Context

Originating from the Western Himalayan glaciers, the Indus Basin comprises six main rivers – the Indus, Jhelum, Chenab, Ravi, Sutlej, and Kabul – irrigating over 16 million hectares of farmland. With heavy reliance on meltwater recharge, the water-stressed semi-arid basin hosts the globe's most extensive transboundary irrigation system. Pakistan is facing water scarcity due to both the amount of water taken from sources (withdrawals) and the water available per capita. The Indus River alone contributes to 25% of Pakistan's GDP, supporting nearly 90% of its food production.[1] It draws 45% of its overall flow from snow and ice meltwaters in the Hindu Kush - Karakorum - Himalaya region. Rising climate change and anthropogenic black carbon deposits will expedite glacier melting, altering the flow of the vital Indus River system, and seriously impacting Pakistan's economy and ecology.[2] A 2020–2021 World Bank report estimates the water shortage will increase to 32% by 2025.[3] Due to these cumulative shocks, hard-won gains in terms of poverty reduction and inclusive development may stall or be reversed. The 2022 floods in Pakistan underscore the urgency. Intense rainfall flooded the Indus, causing 1,500 deaths and affecting an estimated 33 million people.[4] After the 2022 flood, a rapid needs assessment (RNA)[5] estimated that 5.4 million people (16% of the 33 million) in 84 affected districts shifted to unsafe drinking water sources leading to health impacts. About 1.8 million people had water services restored in the following year, leaving 3.6 million people still without services due to the flood; the human impact is disproportionately borne by vulnerable groups including women, children and youth. The assessment revealed inadequate climate-resilient infrastructure, emphasising the need for urgent climate-resilient and green investments in Pakistan's water, sanitation and hygiene (WASH) sector. This, alongside inclusive policies, regulatory frameworks, and capacity building to foster adaptive practices, is required for Pakistan to adapt to and mitigate future climate shocks. Conversely, previous water resource management interventions in the Indus Basin focused on structural engineering for the Indus Basin Irrigation System (IBIS), including the construction of dams, barrages and canals.

Pakistani communities, especially women and youth, are becoming more vulnerable to disaster-driven displacement, as noted by the RNA. This is partly due to traditional gender roles and patriarchal norms. Discrimination in employment and land rights persists for women. Considering climate-induced shocks, sustainable peace and security require women's full and equal participation. The crucial and meaningful role of women and youth in humanitarian response, disaster management and preparedness and in building resilient communities remain underappreciated.[6] Despite the prevailing gender discrimination, women in Pakistan continue to lead from positions of power, including mitigating climate change impacts at both the state level and the local level. This leadership needs to be supported and harnessed. To tackle the monumental challenge of climate change in the vital Indus Basin.

Meeting these challenges demands a swift shift to an integrated, innovative, and adaptive Indus water resource management approach to counter the growing volatility of water availability. Importantly, addressing this challenge offers a unique opportunity for gender-inclusive outcomes. The project is tailored to the diverse landscapes and communities along the Indus, and aligned with existing national plans and initiatives, notably the 2022 Living Indus Initiative,[7] and the Resilient

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[1] Janjua, S., Hassan, I., Muhammad, S., Ahmed, S., & Ahmed, A. (2021, October 4). Water management in Pakistan's Indus Basin: challenges and opportunities. *Water Policy*, *23*(6), 1329–1343.

[2] World Bank Group. 2022. Pakistan Country Climate and Development Report. CCDR Series; Washington, DC.

[3] Lytton, Lucy; Ali, Akthar; Garthwaite, Bill; Punthakey, Jehangir F.; Saeed, Basharat Ahmed. Groundwater in Pakistan's Indus Basin: Present and Future Prospects (English). Washington, DC: World Bank Group.

[4] Otto, F. E. L., Zachariah, M., Saeed, F., Siddiqi, A., Kamil, S., Mushtaq, H., Arulalan, T., Achuta Rao, K., Chaithra, S. T., Barnes, C., Philip, S., Kew, S., Vautard, R., Koren, G., Pinto, I., Wolski, P., Vahlberg, M., Singh, R., Arrighi, J., Clarke, B. (2023, March 17). Climate change increased extreme monsoon rainfall, flooding highly vulnerable communities in Pakistan. Environmental Research: Climate.

[5] UNDP (2022) Pakistan Floods 2022: Post-disaster Needs Assessment. Ministry of Planning, Development and Special Initiatives. Retrieved from link

[6] UN Women. (2023). Women, peace and security and humanitarian action in Pakistan. Retrieved from link

[7] Living Indus. (2023). Living-Indus-Investing-in-Ecological-Restoration-Final-Version. doi:10.1111/j.1467-8330.2008.00709.x.

Recovery, Rehabilitation, and Reconstruction Framework (4RF),[8] and aligns with the 2023 National Adaptation Plan (NAP). This project targets six specific climate change adaptation challenges confronted by Indus Basin residents:

1. **Cryosphere Risks:** Melting glaciers, snowpack, and permafrost, which can lead to catastrophic floods, avalanches, and landslides in the upper basin.
2. **Drying Springs:** Springs vital for rural and urban water sources in the mid-hills of the Basin are drying. Adequate springshed revival and management is necessary to address this.
3. **Depleting groundwater and inadequate infrastructure** in the middle basin plains hinder access to water. Unregulated groundwater uses and poor supply systems, damaged by floods and contamination, further impact domestic water services. It is essential to improve groundwater management and enhance resilience of community water supply services to combat this.
4. **Pollution and access to clean water:** Increased urbanisation, droughts and floods have increased the urban effluent reaching the Indus, increasing pollution, and constraining access to clean water in the Middle and lower basin. Ecosystem-based solutions are essential to mitigate this.
5. **Unsustainable water use and climate impacts** threaten the lower basin. Surface water conservation in the form of community ponds for floodwater storage and restored waterways offer solutions.
6. **Community resilience to climate change:** National and provincial institutions and Indus Basin's communities co-create and adopt innovative adaptation solutions (practices, tools, and technologies) and strategies (local and provincial development plans, and national and provincial policies and regulatory frameworks) for comprehensive climate resilience, building ownership and knowledge, empowering communities and driving uptake beyond the project.

A.2. Cryosphere Disaster Risk Reduction Context

The Indus Basin, covering over 40% of the basin area of the Hindu Kush Himalaya (HKH) region, plays a crucial role in sustaining the livelihoods of 300 million people. However, it is facing escalating vulnerability to climate change impacts, primarily driven by rising temperatures and shifting precipitation patterns. This has led to a heightened occurrence of hazardous events such as Glacial Lake Outburst Floods (GLOFs), avalanches, glacier surges, glacial collapses, ice/landslide dammed lakes, and abrupt draining of englacial water bodies. These events are putting immense pressure on mountain communities, their infrastructure, resilience, and their means of sustenance.

Addressing these challenges requires a comprehensive approach that combines mitigation and adaptation efforts. Notably, there is an imperative to recognise and rectify gender-based disparities deeply ingrained in local cultures. Disaster risk reduction (DRR) initiatives must be viewed as long-term endeavours aimed at reducing the vulnerability of women and other marginalised groups in these areas.[9] The soaring temperatures in northern Pakistan have led to the formation and expansion of supraglacial lakes, posing flood risks downstream (Figure 1).[9] Consequently, investments in climate risk management, particularly for GLOF hazards, have primarily been driven by multilateral funds.

The GLOF-I Project (2011–2015), supported by the Adaptation Fund (AF), has been extended to 12 districts in Khyber Pakhtunkhwa (KP) and Gilgit-Baltistan (GB) provinces through the GLOF-II project (2016–2024) funded by the Green Climate Fund (GCF). While advanced early warning systems are being implemented across these districts, there remains limited emphasis on community-based risk management and grassroots capacity building, including aspects of gender inclusivity. Involvement of women in leadership roles and inclusive disaster risk management (DRM) practices is indispensable for fortifying community resilience.[10]

According to the 2021 World Bank Country Profile, Pakistan has experienced an estimated 0.57°C of warming over the 20th century, with a more accelerated warming of 0.47°C observed between 1961 and 2007. This warming trend is notably skewed towards the winter and post-monsoon months (November–February), posing a greater threat to high-altitude communities in Gilgit-Baltistan and Khyber Pakhtunkhwa. Recognising the urgency, the Government of Pakistan has endorsed the first National Master Plan for a Flood Telemetry System to monitor the major tributaries of the Indus in Pakistan. This underscores the criticality of flood telemetry and opens an opportunity to integrate cost-effective Community-Based Monitoring and Early Warning Systems (CB-MEWS) developed by ICIMOD and its Pakistani partners at grassroots level, with the potential for broader implementation. Moreover, the Government of Pakistan has introduced the National Disaster Risk Reduction (DRR) Policy led by the National Disaster Management Authority (NDMA). This policy document highlights a proactive approach to risk assessments, prevention, mitigation, and preparedness. Critically, the policy includes

[8] UNDP. (2022). Final 4RF. [In response to the 2022 floods, the Resilient Recovery, Rehabilitation, and Reconstruction Framework (4RF) is the Government of Pakistan's strategic policy and prioritisation document, which is guiding the recovery, rehabilitation, and reconstruction of the country]. doi: link.

[9] Ashraf, A., & Rustam, M. (2020). Monitoring Supraglacial lakes Formation and Risk of Outburst Flooding in the Himalayan Cryosphere of Pakistan. *International Journal of Environment*,

[10] UNDP. (2021). Climate equity: Women as agents of change. Retrieved from link

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Springshed Revival and Management: Springs vital for rural and urban water sources in the mid-hills of the Basin are drying.¶
Groundwater Management and Resilience of Community Water Supply Services: Depleting groundwater and inadequate infrastructure in the middle basin plains hinder access to water. Unregulated groundwater uses and poor supply systems, damaged by floods and contamination, further impact domestic water services.¶
Ecosystem-based Solutions: Increased urbanisation, droughts and floods have increased the urban effluent reaching the Indus, increasing pollution, and constraining access to clean water in the Middle and lower basin.¶
Surface Water Conservation: Unsustainable water use, and climate impact threaten the lower basin. Community ponds for floodwater storage and restored waterways offer solutions.¶
Adaptive capacities and empowered communities for strengthened resilience: National and provincial institutions and Indus Basin's communities co-create and adopt innovative adaptation solutions (practices, tools, and technologies) and strategies (local and provincial development plans, and national and provincial policies and regulatory frameworks) for comprehensive climate resilience, building ownership and knowledge, and driving uptake beyond the project.¶

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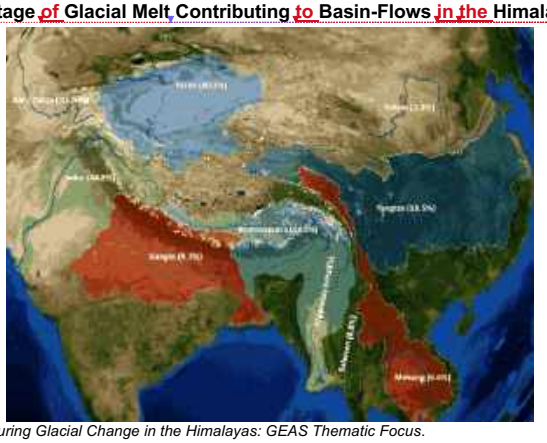
focus on capacity development of the vulnerable populations. Provincial-level Disaster Management Authorities have also formulated DRR policies and action plans to support the national DRR policy.

Moreover, adopting a more community-centred approach aligns with the UNDP GLOF-II initiative, which presents a significant avenue for integrating a gender equality and social inclusion (GESI) perspective into disaster risk reduction efforts as outlined in the Sendai Framework. General Recommendation 37, of the Committee for the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW), pertains to climate change-related risks, and offers guidance on interpreting and applying CEDAW in DRM and climate change adaptation. This provides the foundation for international norms in formulating and executing gender-sensitive DRM legislation.

This critical intersection of climate change, gender equality, and disaster risk reduction was thoroughly examined in the 2022 ICIMOD study entitled 'State of gender equality and climate change in South Asia and the Hindu Kush Himalaya'.[11] The study highlighted Pakistan's 2022 Climate Change Gender Action Plan as a positive regional example, positioning it as a valuable tool for enhancing knowledge, capacities, coordination and actions to strengthen gender-responsive climate strategies aligning with national objectives.

Figure 1: Predicted Percentage of Glacial Melt Contributing to Basin-Flows in the Himalayan Basins



Source: UNEP-GRID. 2012. *Measuring Glacial Change in the Himalayas: GEAS Thematic Focus.*

A.3. Springs Context

Springs are a crucial part of groundwater systems. There needs to be more clarity regarding springs in the water related policy documents, in order to differentiate them from groundwater systems. This lack of clarity around springs creates misaligned policies that exacerbate the problem. Springs are also part of complex socio-technical and informal governance systems with pronounced gender, equity, and cultural dimensions. However, these systems are not understood or considered as part of the groundwater systems, again leading to inappropriate policies and interventions. ICIMOD has developed an integrated community-based methodology and piloted it in Pakistan and Nepal. The lessons learnt from these experiences have been incorporated into a gender orientation note for springshed revival and management.[12] In addition, the livelihood implications of changes in these springs are not sufficiently incorporated into programmatic design; this is an important omission, especially considering that they contribute up to 25% of rural and municipal water in the mid-hills of the basin around Malakand, and Hazara. These are critical aspects of non-surface water, non-pumped groundwater resources that these communities require to meet their water needs. These aspects have led the project design team to prioritise them as areas of intervention for this project, and underlines the need to consider more the administration and conservation of springs. It is an essential component of an integrated approach in the Indus Basin, especially considering recent droughts and floods. Due to frequent earthquakes since 2005, many springs in the region have changed their course or dried up.[13] Developing an inventory of springs and assessing water availability at the municipal level throughout the year will be essential to adaptive and climate-resilient water resource development and management. The National Agriculture Research Centre (NARC) has identified this approach as a priority.[14] Furthermore, a crucial element of adaptive

[11] ICIMOD, UNEP, UN Women (2022), State of Gender Equality and Climate Change in South Asia and the Hindu Kush Himalaya. Retrieved from link.

[12] ICIMOD. (2018). Spring manual 2018. ICIMOD Library. Link.

[13] The New Humanitarian (2006), Pakistan: Water a major challenge for earthquake survivors, retrieved 20.02.2023 link

[14] Sharma, S., & Adhikari, R. (2020). The potential of springs for climate-resilient mountain livelihoods in the Hindu Kush Himalayas. Working Paper No. 25. International Centre for Integrated Mountain Development (ICIMOD). Retrieved from link

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development is to address the volatility of glacial meltwater availability. Combined with communal ponds and an effective locally managed springshed revival can smooth out the flood and drought cycles locally. This can empower communities along the river to become resilient and adapt to the new climate reality. In collaboration with the Pakistan Agricultural Research Council (PARC), ICIMOD has organised several training workshops in Pakistan in the past 5 years. The proposed project will build on this cooperation and deepen the integration of the gender dimension therein.

A.4. Groundwater Management and Resilience of Community Water Supply Services Context

Pakistan ranks fourth in global groundwater extraction, heavily using the Indus Basin Aquifer, the second most overstressed aquifer globally. It is the world's leading groundwater exporter, sustaining water-intensive exports like rice, leather, and textiles. Groundwater provides more than 50% of the agricultural water requirement of Punjab, at least 20% for Sindh and 50% for Balochistan. In addition, groundwater serves more than 70% of Pakistan's drinking water requirement.[15] Groundwater, a vital resource and buffer against climate change, is threatened by over-extraction and pollution due to poor governance. Future sustainability is uncertain; maintaining agriculture use strains other sectors and limits drought resilience. In the next three decades, around 12 billion cubic metres of irrigation water must be reallocated, in which the performance of the Indus Basin Irrigation System (IBIS) will be a critical factor.[16]

Pakistan's drive for sustainable groundwater governance is evident in recent legal and institutional reforms. The 2018 National Water Policy advocates a Groundwater Authority in Islamabad, while the Punjab Water Act (2019) and Khyber Pakhtunkhwa Water Act (2020) empower provincial water resource commissions to licence groundwater use. Although effective governance implementation lags at both federal and provincial tiers, a particular gap remains in community participation and mobilisation for implementation, even though the National Water Policy holds that "people are the prime stakeholders of the water sector". Groundwater scarcity is increasing, notably in Khyber Pakhtunkhwa Province and is exacerbated by population growth, expanding agriculture, and urbanisation. Pakistan's arid to semi-arid climate covers 796,095 km^2. With excessive groundwater extraction and limited recharge, artificial aquifer restoration and abstraction management are crucial. Fragmented management due to disjointed sectoral and provincial approaches hinder basin-wide effectiveness and shared benefits.

The project will build capacity and improve support for implementing existing provincial groundwater legislation and enacting water acts in Khyber Pakhtunkhwa and Sindh provinces for sustainable and inclusive groundwater governance for reliable access amid climate change, aiding adaptation efforts. The correlation between groundwater degradation and stress within human communities must be explored and emphasised far more than it is at present. As it stands, current policies need a supplementary protocol, or substantive addendum that showcases the implications of these policies on vulnerable communities; at times policies inadvertently reinforce the exclusion of communities from groundwater management. Remote sensing and land use modelling can effectively quantify water use practices and associated changes.[17] These techniques can identify the primary socioeconomic drivers relevant to each projection and evaluate the impacts of projected changes on critical economic and social indicators related to ecosystem services and land degradation.

In addition, in areas prone to floods and other disasters, the resilience of WASH infrastructure is crucial and requires addressing issues like the durability of physical WASH infrastructure, the reliability and yield of wells, and the protection of water quality.

The Post-Disaster Needs Assessment (PDNA) report launched in January 2023 estimates damages worth US$575 million with additional losses of US$112 million incurred in the WASH sector. The damages include over 4,000 water supply schemes and 2,700 sanitation schemes, managed mainly by the Public Health Engineering Department (PHED). Data collected indicates that 1,346 schemes were destroyed, with an estimated two-thirds of the affected population accessing these services. More data is needed on community and private infrastructure. The resilient reconstruction needs of the sector overall have been estimated at US$327 million. This estimate considers infrastructure and investment in sustainable operation and maintenance of these systems.

A.5. Ecosystem-based Adaptations Context

Ecosystem-based Adaptations (EbAs) are essential to creating a robust, resilient, local approach to climate adaptation. They are actions that encourage the protection, sustainable management, and restoration of natural or modified ecosystems to address societal challenges while simultaneously supporting human wellbeing and security as well as biodiversity benefits. Nature-based innovations, particularly in technology and economy, supported by new social-technologies (behavioural change) have been gaining increasing attention recently, including endorsement by the Secretary General of the United Nations. Currently, water management in Pakistan remains heavily dominated by traditional, human-built infrastructure. The potential for EbAs remains under-utilised, including green infrastructure that can cost-effectively

[15] National Water Policy of Pakistan, (2018), Government of Pakistan Ministry of Water Resources, retrieved 20.02.2023, link

[16] World Bank, (2022), Country Climate and Development Report (CCDR) Pakistan, retrieved 26/05/2023, link

[17] Uddin, Kabir. (2019) "Operational Flood Mapping Using Multi-Temporal Sentinel-1 SAR Images: A Case Study from Bangladesh", ICIMOD, Geophysical Institute, University of Alaska Fairbanks

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substitute, augment, or work in parallel with grey infrastructure. This potential is even more relevant considering the strain of urbanisation in Pakistan, where its urban population is above the regional average, according to the World Bank Database. Moreover, implementers of water policies freely share sectoral innovations and initiatives that situate women at the centre of planning criteria and discuss outcomes in terms of women's resilience and vulnerability, though these remain underutilised.

Less than 1% of wastewater is treated in the Indus Basin, falling short of the Sustainable Development Goal (SDG) of being able to treat 50% of the wastewater generated. Despite the existing legal provisions for treating wastewater from industrial, domestic, and municipal sources, 99% of wastewater is discharged untreated in open drains, eventually entering the Indus River System. Of the 99%, about 75% comes from untreated urban and rural residential wastewater.[18] This directly affects the health and sustainability of the Indus River system and all that depends on the basin, including human, terrestrial, and aquatic life. Untreated wastewater further contributes to climate change with a GHG footprint three times that of the same wastewater treated in a traditional wastewater treatment plant. Of the 388 cities in Pakistan, only eight have wastewater treatment facilities, with some only partially functioning. Establishing and strictly implementing adequate effluent treatment facilities for industries and municipalities along the Indus is critical. This should be supplemented using nature-based solutions (NbS) (water- or substrate-based) for wastewater treatment. Constructed wetlands are treatment solutions that are less expensive and more cost-effective, using natural processes, local materials for construction, and low-cost and skill requirements for operation and maintenance. The installations include the construction of basins, lining, filling of different strata with selected filtration materials, planting of vegetation and outlet of the treated water. Depending on the specific locations of the wetlands, the treated water can be used for irrigation, watering public parks or augmenting domestic water supply, rendering communities more resilient. UNICEF and its partners have successfully tested constructed wetlands as NbS for sewage treatment in a decentralised manner for small settlements of an average of 200 households.

A.6. Surface Water Conservation Context

Apart from water scarcity, increased temperatures, varied precipitation and monsoon patterns, and increased emissions have resulted in a greater frequency of extreme weather events, as witnessed in the devastating impact of flooding in 2022 that severely affected over 84 districts of Pakistan, leaving nearly 33 million people including 10 million children in need of humanitarian assistance. As per the RNA conducted by humanitarian partners in the flood-affected locations of Sindh, Balochistan, Punjab, and Khyber Pakhtunkhwa, 5.4 million people (16%) from the 33 million people in flood-affected 84 districts shifted from using protected drinking water sources to unprotected sources, and 6.3 million people (19%) lost household sanitation with an estimated 950,000 household latrines damaged.

The recently launched PDNA estimates damages worth US$D112 million in the WASH sector. The damages encompass more than 4,000 water supply schemes and 2,700 sanitation schemes, which are primarily managed by the PHED. Data shows that 1,346 schemes were destroyed, with limited information on community and private infrastructure. However, it is estimated that about two-thirds of the affected population relied on these services. The resilient reconstruction needs of the WASH sector have been estimated at US$327 million. This estimate considers infrastructure and investment in sustainable operations and maintenance of these systems.

Therefore, this project, in partnership with UNICEF and UN Women, plans to reconstruct and upgrade selected community structures in such a manner that builds back better and, in the process, lays the foundations for the planning, design and delivery of EbA WASH services in the future. Community rainwater harvesting ponds contribute to reducing runoff, improving water quality, and creating additional access to water supply during the dry seasons, especially for the women and most marginalised groups. In addition to providing additional water storage for extreme dry seasons and reducing runoff during the rainy season, community ponds will enable improved salinity control and increase groundwater recharge. Approximately 50% of land in the Lower Indus region, specifically in Sindh Province, is affected by salinity, presenting a significant threat to agricultural productivity, food security and livelihoods.

A.7. Gender and Child Dimension Context

Women and children are most vulnerable to the impacts of climate change. As climate change brings a greater frequency and intensity of drought, floods, heatwaves, air pollution and disease, it is critical to prioritise positioning women and children at the centre of climate mitigation and adaptation efforts.

The most recent PDNA (2022) highlighted the need to integrate gender indicators and address the social sustainability, inclusion, and gender dimensions of climate resilience. The 2022 floods and evidence underscore the urgency of establishing community-led platforms for vulnerable groups, ensuring gender-responsive early warning, evacuation and resettlement plans, and training of local authorities on inclusive disaster preparedness measures as mentioned in the PDNA. UN Women and UNICEF have continued to support the National and Provincial Disaster Management Authorities

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[18] Islamic Republic of Pakistan: Institutional Transformation of the Punjab Irrigation Department to a Water Resources Department, (2021), Asian Development Bank, retrieved 20.02.2023 link

establishment and management of Gender and Child Cells to cater to the needs of vulnerable populations in climate disasters and the climate context.

The gender division of labour in Pakistan is highly skewed, with women often bearing an excessive burden as they juggle agricultural, pastoral, and wage labour are combined with household, community, and casual labour. With high rates of male outmigration that is a feature of the whole region, women's workloads in these domains of work have intensified without corresponding increases in access to resources and inclusion in decision-making. Women continue to be constrained by unequal power relations, gender biases, and sometimes under-representation, resulting in limited access to resources and control over critical natural resources. Marginalising women's work contributions relative to men's renders them more vulnerable than men. Therefore, climate change risks and vulnerability have a fundamental gender dimension.[19] Climate-related disasters may disrupt local security safety nets, leaving women and children unaccompanied, separated, or orphaned due to the erosion and breakdown of normal social controls and protections, making them especially vulnerable to human trafficking. Economically impoverished mountain families are particularly vulnerable to forced labour and exploitation. This vulnerability extends to women's and children's ability to react to early warning signals. For instance, women may be unable to act on the information they receive because it is often disseminated primarily in public places to which many women do not have easy access. Even when women receive warnings, they can be constrained by cultural norms restricting their freedom of public movement, especially when alone or unaccompanied by a male family member.[20]

As climate disasters increasingly affect livelihoods, working men are migrating more, exposing women and children to persistent climate-caused natural disaster risks, as they tend to have less access to migration as an adaptation strategy. This is both the case for internal and international migration.[21] Urbanisation, a form of internal migration where the population moves from rural to urban areas, follows this trend. Climate change also challenges children's rights under the Convention on the Rights of the Child (CRC,) which Pakistan signed. Women and children bear the burden of collecting water, so gender-inclusive adaptation is crucial for widespread impact. It is critical to include the gender dimension in developing local DRR mechanisms; the need for a GESI approach to DRR is outlined in the Sendai Framework.

The Sendai Framework highlights four priorities for action on disaster risk management. General Recommendation 37 of the CEDAW Committee guides gender-sensitive DRM and climate adaptation, forming international norms. Explored in the 2022 ICIMOD study 'State of Gender Equality and Climate Change in South Asia and the Hindu Kush Himalaya,' Pakistan's 2022 Climate Change Gender Action Plan stands out as a positive example. It enhances knowledge and capacities, identifies gaps, and strengthens gender-responsive strategies in sectors (e.g., agriculture, water, DRM, forests and biodiversity, coastal management, energy, and transportation). In the 4RF adopted in 2022 also prioritises addressing social vulnerabilities in the context of climate change towards resilient societies and acknowledges that an inclusive and participatory approach to resilience building is a necessity.

A.8. Institutional Response Context

In July 2023, Pakistan launched its inaugural NAP, a significant step toward climate resilience. It emphasises five core priorities, with the first being the agriculture-water link. Strategies here focus on climate-smart farming, modernising irrigation services, long-term agriculture growth strategies, and managing river flow under different climates. The NAP also addresses energy, health, and DRM sectors. Pioneering in Pakistan, it stresses urgent community adaptive capacity and overall environmental resilience. This project aims to implement NAP elements and support Pakistan's government in its implementation.

Another milestone was the Climate Change Gender Action Plan (ccGAP) adopted in 2022 that integrates gender and climate dimensions in key sectors of economy, particularly agriculture and appropriate security, water, sanitation, DRR, forest and biodiversity, coastal management, and energy transportation. The ccGAP builds on broad consultations and assessment carried out in support of the International Union of Conservation of Nature (IUCN) Pakistan and funded by a Gender Readiness Grant from the Green Climate Fund. It also benefitted from the extensive study on women's role in climate change in Pakistan, 'Climate Equity: Women as Agents of Change' (2022) carried out by the National Commission on the Status of Women in support of UNDP, UNFPA and UN Women. These form a baseline for the hardships faced by women in the country but also for the opportunities for gender-responsive climate resilience in Pakistan. Furthermore, UN Women supported the National Commission on the Status of Women in the launch of the National Gender Data Portal (NGDP) of Pakistan in 2023 that collects, collates, integrate, and disseminates information on gender- and climate-related indicators using dynamic tools to inform policymakers and leaders.

On June 6, 2021, with UNICEF and partners, Pakistan launched the global UN Decade of Ecosystem Restoration 2021-2030 to prevent, halt and reverse worldwide ecosystem degradation. As a leader in this sector, Pakistan can showcase effective models to meet this aim. The government prioritises promoting EbAs to protect, sustainably manage, and restore

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[19] Gurung Goodrich, Chanda (2017) Status of Gender, Vulnerabilities and Adaptation to Climate Change in the Hindu Kush Himalaya, ICIMOD

[20] D'Cunha, J. (1997). Engendering disaster preparedness and management. Asian Disaster Management News

[21] International Labour Organization (ILO), Female Labour Migration from Pakistan: A Gender Perspective, Publication: Geneva: ILO, 2019.

ecosystems, addressing societal challenges while benefiting people and nature. UNICEF, a key partner in the 'One UN' programme, collaborates with Pakistan's government for water and climate initiatives. Pakistan's Ministry of Climate Change & Environmental Coordination (MoCC&EC) is UNICEF's federal counterpart.

Pakistan is a founding regional member country of ICIMOD, established in 1983. The incumbent Secretary of the Ministry of National Food Security and Research formally represents Pakistan in the ICIMOD Board of Governors. Since its inception, Pakistan and ICIMOD have been working together for the mountain agenda in the HKH region with policymakers, experts, planners, and practitioners.

UNICEF and the Pakistan Council on Research in Water Resources (PCRWR) have studied innovative artificial techniques coupled with integrated watershed management using NbS to enhance groundwater recharge. They have also assessed the feasibility of simple and low-cost-high-efficiency irrigation systems to control water abstraction (or extraction) in Pakistan. Recently UNICEF Pakistan and PCRWR have conducted a feasibility study on selected locations.

Strengthening Pakistan's institutions, systems, and knowledge is vital for replicating successful Indus River Basin ecosystem restoration and NbS in the water sector. Following the 18th constitutional amendment, many sectors' implementation was devolved to provinces, with the federal role shifting to guidance, coordination, and reporting. Still, institutional setups under the Revised National Climate Change Policy 2021 and Updated Nationally Determined Contributions (NDC-2021) offer federal and provincial levels the potential to strengthen the system. UNICEF supports this process through Capacity Needs Assessments (CNA), partnering with PCRWR and the Ministry of Water Resources (MoWR) for capacity development and knowledge management (KM). UNICEF's ongoing study aims to bridge institutional gaps in water and climate sectors, supporting the government on the 2023–2025 Country Programme.

In 2021, the MoCC&EC, with the technical and financial support of UNICEF, conducted a climate risk assessment of the WASH sector in the four provinces of Pakistan, which included hazard, exposure, vulnerability and capacity assessments for the WASH sector and proposed solutions to reduce vulnerabilities and increase capacities of climate change adaptation of the sector. The proposed solutions include technology choices, infrastructure design and construction, governance structures and financing alternatives.

The Government of Pakistan has recognised these challenges and is striving to seize the opportunities inherent in the evolution of its relationship with the Indus Valley to promote a transition to a greener and more climate-adaptive future. Of relevance are three initiatives:

1. **Living Indus:** This is an umbrella initiative and a call to action to lead and consolidate initiatives to restore the ecological health of the Indus within the boundaries of Pakistan, which is most vulnerable to climate change.[22]
2. **Clean Green Pakistan Index:** This is a keystone governmental initiative that will frame the overall intervention approach of the proposed action. It will also be the Government of Pakistan's main tool for monitoring the progress of the proposed action over a critical performance indicator dashboard.[23]
3. **4RF:** A PDNA, undertaken by the Government of Pakistan, indicated that estimates of over US$16 billion would be required for recovery after the devastating floods of 2022. Sindh was the province worst affected by the disaster, followed by Balochistan, Khyber Pakhtunkhwa, and Punjab. It integrates social sustainability, inclusion, and a gender lens, and provides an overarching framework for planning, financing, implementing, and monitoring Pakistan's resilient recovery, rehabilitation, and reconstruction efforts.[24]

A.9. The Transboundary Basin Context

This project has considered the transboundary nature of the Indus Basin, which originates in China, flows through India into Pakistan, and is fed by the Kabul River from Afghanistan. The Indus Waters Treaty (IWT), signed in 1960 between India and Pakistan, presents a key component in the management of the water resources between countries concerned and has prevented major conflicts over the river to date. The Indus Water Treaty has been a critical mechanism for managing competition over water usage, hydro energy, and construction of dams that impact water availability in both Pakistan and India. However, currently, the IWT faces challenges, with limited prospects for change.

Growing water stress, population growth, and hydro-development aspirations strain the existing water-sharing arrangements. The effects of climate change pose a significant challenge to the Indus Basin and the long-term water security of both India and Pakistan. The Himalayan glaciers, a crucial water source for the Indus River system, are projected to diminish further, leading to changes in water flow and reduced groundwater recharge. Increasing water stress and population growth in the region intensify the demand for water resources. Furthermore, this dynamic is likely to complicate the climate-security nexus, with ever-increasing inter and intra-communal competition over access to water resources risking an exacerbation of inequitable gender dynamics.

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[22] Living Indus, retrieved 20.02.2023, link
[23] Clean Green Pakistan, retrieved 27.02.2023, link
[24] Pakistan Floods 2022: Resilient Recovery, Rehabilitation, and Reconstruction Framework (4RF), retrieved 18.02.2023, link

Opportunities exist amid these circumstances. Transboundary scientific exchange continues, facilitated by ICIMOD, which leads the Secretariat of the Upper Indus Basin Network (UIBN). The UIBN is a voluntary and informal knowledge and research network, which connects national and international researchers, coordinating climate, cryosphere, water, and adaptation research. It enhances understanding, solutions, and stakeholder engagement for water availability, hazards, and resilience. UIBN reinforces the Indus Basin Initiative's role in climate change adaptation. This underscores the significance of basin-wide approaches for shared risk mitigation beyond national levels. Moreover, bilateral cooperation on mutually beneficial mitigation and adaptation measures between the countries can be fostered through promoting learning and exchange on adaptation both for communities and governments. There is a need to keep these learning and exchange less technical and balancing gender representation.

B. Project Objectives

To meet the above-outlined challenges, the SAFER project seeks "**to reduce the vulnerability and increase the adaptive capacity of the population residing in Pakistan's Indus Basin to the impacts of climate change**."

It is structured into six distinct components:

1. **Cryosphere CB-MEWS:** Community and institutional capacity to anticipate and respond to climate-generated cryosphere hazards are improved, reducing the likelihood of loss of life and property.

   Aligned with Adaptation Fund Outcomes:

   1: Reduced exposure to climate-related hazards and threats

   2: Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses.

2. **Springshed Revival and Management:** Community and institutional capacity to restore, manage and revive springs is enhanced, increasing local resilience and climate-adaptive capacity in the face of changing precipitation patterns in a gender-inclusive manner.

   Aligned with Adaptation Fund Outcomes:

   1: Reduced exposure to climate-related hazards and threats

   2: Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses

   3: Strengthened awareness and ownership of adaptation and climate risk reduction processes at the local level

   5: Increased ecosystem resilience in response to climate change and variability-induced stress

   7: Improved policies and regulations that promote and enforce resilience measures

3. **Groundwater Management and Resilience of Community Water Supply Services:** Community and institutional capacity enhanced to mitigate and reverse groundwater depletion through construction of nature-based groundwater recharge facilities and establish/upgrade climate-resilient water supply infrastructure to provide sustainable water supply services for vulnerable and risk-prone communities with the promotion of efficient use of groundwater for domestic use.

   Aligned with Adaptation Fund Outcomes:

   1: Reduced exposure to climate-related hazards and threats

   2: Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses

   3: Strengthened awareness and ownership of adaptation and climate risk reduction processes at the local level

   4: Increased adaptive capacity within relevant development-sector services and infrastructure assets

   7: Improved policies and regulations that promote and enforce resilience measures

4. **Ecosystem-based adaptation:** Community and institutional capacity to transform an ecological liability into a climate-adaptive asset is increased, by treating and using wastewater, reducing reliance on pumped water, and rendering communities more adaptive to climate change impacts.

   Aligned with Adaptation Fund Outcomes:

   1: Reduced exposure to climate-related hazards and threats

   3: Strengthened awareness and ownership of adaptation and climate risk reduction processes at the local level

Deleted: International mediation led by the World Bank plays a defining role in resolving disputes and ensuring compliance. In summary, the IWT has successfully managed water disputes between India and Pakistan for several decades, and throughout prolonged tension, its outlook is uncertain, but many stakeholders have a significant interest in it continuing in force unchanged, which is the most likely medium-term outcome.¶

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4: Increased adaptive capacity within relevant development-sector services and infrastructure assets

5: Increased ecosystem resilience in response to climate change and variability-induced stress

5. **Surface Water Conservation:** Community and institutional capacity to reduce surface water waste and increase its storage for productive use is increased, allowing communities to adapt to climate-induced shocks.

   Aligned with Adaptation Fund Outcomes:

   1: Reduced exposure to climate-related hazards and threats

   2: Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses

   4: Increased adaptive capacity within relevant development-sector services and infrastructure assets

6. **Adaptive capacities and empowered communities for strengthened resilience to climate change:** National-, provincial- and district-level capacities of communities and government strengthened to manage climate risks drawing on piloting of innovative, gender-inclusive approaches to climate adaptation and coordination, and successful local adaptation strategies documented that guide policy development and implementation nationally and regionally. This component will not only serve as an asset for the project but also be the foundation for an overall KM platform for the Living Indus Initiative.

   Aligned with Adaptation Fund Outcomes:

   2: Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses

   3: Strengthened awareness and ownership of adaptation and climate risk reduction processes at the local level

   4: Increased adaptive capacity within relevant development-sector services and infrastructure assets

   7: Improved policies and regulations that promote and enforce resilience measures

   8: Support the development and diffusion of innovative adaptation practices, tools, and technologies

C. Project Components and Financing

Each component is subdivided into two/three distinct output categories:

- **Knowledge gap filling, or ground-truthing** ensures contextual appropriateness of the individual adaptive measure and includes communities in deploying the solutions and ensuring their sustainability.
- **Community-level interventions** that increase the adaptive capacity of members of the communities, with a focus on gender and youth inclusion.
- **Institutional changes** or advocacy thereof, co-developed with the local authorities to support the scaling up of the successful adaptive strategies and practices at the local and provincial level.

These component-level outputs will be integrated into a national policy output under component 6, in close collaboration with the MoCC&EC of Pakistan, to ensure a cohesive and coordinated approach across the local-level interventions across Components 1-6.

The complex investments made by the project will be in small-scale protective and basic service infrastructure and ecosystems. These investments have been fully identified (in terms of scope and geography) and budgeted through stakeholder consultations (Section II/H) and environmental and social impact screening (Section II/K). As a result, the project has developed a Theory of Change (Annex 1), an indicative Work Plan (Annex 2), a comprehensive environmental and social impact analysis and resultant Environmental and Social Management Plan (Annex 3), a gender-inclusive Grievance Redressal Mechanism (Annex 4) and a Gender Analysis and Action Plan (Annex 5).

The total requested financing for the project is US$10,000,000, which includes US$9,216,590 as the project cost and US$783,410 as the project cycle management fee. The output-wise budget allocation is shown in Table 1 and the detailed budget is given at Section III/G.

Table 1: Project Components and Financing

Project Components	Expected Concrete Outputs	Expected Outcomes	Amount (US$)
	1.1. Integrated cryosphere risk mapping through community engagement.		432,926

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Project Components	Expected Concrete Outputs	Expected Outcomes	Amount (US$)
1. Cryosphere Disaster Risk Reduction	1.2. Community-based monitoring and early warning systems established.	Reduced climate-induced cryosphere multi-hazard risk.	1,000,233
	1.3. Strengthened resilience to cryosphere-related risks.		425,000
		Sub-Total Component 1	1,858,159
2. Springshed Revival and Management	2.1. A comprehensive web-based information management system of springsheds and springs prepared for Malakand and Hazara divisions.	Increased access to spring water in climate adaptive and gender inclusive manner.	267,000
	2.2. Recharge measures (for improved springshed practices, land use planning, and bioengineering) co-developed and implemented.		540,526
	2.3. Local governance framework for springshed established with enhanced institutional capacity for efficient water resource management.		191,000
		Sub-Total Component 2	998,526
3. Groundwater Management and Resilient Community Water Supply	3.1. Groundwater mapping and groundwater recharge facilities completed in selected water-scarce locations in the middle basin, including establishing/ strengthening operation, maintenance, and management structures.	Improved climate-resilient management of groundwater and community water supply services in vulnerable areas.	344,000
	3.2. Climate-smart and resilient water supply infrastructure established in selected sites, along with contextually relevant management structures with adequate capacity for operation and maintenance of the community infrastructure.		1,964,000
		Sub-Total Component 3	2,308,000
4. Ecosystem-Based Adaptation	4.1. Targeted intervention sites identified for evidence-based, climate adaptive and focused WASH interventions.	WASH infrastructure in the targeted communities in the Middle Indus Basin is more adaptive to climate change-induced shocks with up scaling of the contextually appropriate NbS.	50,000
	4.2. NbS for sewage treatment demonstrated through constructed wetlands along with proper management structures and adequate capacity for operation and maintenance of wetlands.		650,000
		Sub-Total Component 4	700,000
5. Surface Water Conservation	5.1. Government of Sindh supported in systematically prioritising 15 natural waterways and community water ponds to address water storage and wastage issues.	Community and institutional capacity to reduce surface water waste and increase its storage for productive use is increased, allowing communities to adapt to climate-induced shocks.	37,000
	5.2. 15 selected waterways/ponds in Sindh Province restored/rehabilitated, including installation of water quality monitoring systems and establishing and strengthening operation, maintenance, and management structures.		1,043,000
		Sub-Total Component 5	1,080,000
6. Adaptive capacities and empowered communities for strengthened resilience to climate change	6.1. National and provincial capacities strengthened to apply innovative social and technological tools for establishing and enforcing human-centred and gender-transformative systems of climate change adaptation and accelerating the progress towards management of Indus water resources.	Improved knowledge and practices of communities and policymakers on climate change adaptation and climate risk reduction.	350,000
	6.2. National and provincial stakeholders have access to strengthened evidence-based data and knowledge for informed decision-making and implementation of climate adaptation and mitigation that foster collaboration across sectors.		600,000
	6.3. Youth and women's leadership as well as Community-led adaptation solutions strengthened in climate action through awareness-raising and behavioural change campaigns.		731,000
		Sub-Total Component 6	1,681,000

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Project Components	Expected Concrete Outputs	Expected Outcomes	Amount (US$)
Project Execution Cost			590,905
Total Project Cost			9,216,590
Project Cycle Management Fee charged by RIE (8.5% of Total Project Cost)			783,410
Amount of Financing Requested			**10,000,000**

D. Projected Calendar

Milestones	Expected Dates
Start of Project Implementation	1 January 2025
Mid-term Review (if planned)	1 November – 31 December 2026
Project Closing	30 June 2028
Terminal Evaluation	1 April – 30 June 2028

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PART II: PROJECT JUSTIFICATION

A. Project Components

The SAFER project addresses six distinct impacts of climate change and the risks arising from them, faced by the population of Pakistan's Indus Basin: (1) cryosphere-related hazards in the upper basin; (2) drying up of springs linked to rural and municipal water supplies in the middle basin; (3) depletion of groundwater levels and lack or limited climate-resilient water supply facilities in the middle and lower basin; (4) increasing toxicity of urban effluent in the lower Basin; and (5) dwindling availability of surface water for households in the lower Basin; (6) limited technical and adaptive capacities and coordination as well as exclusion of youth and women from policy development and implementation that affect the Indus River basin. To address these climate-related threats to the population of Pakistan's Indus Valley, the project mobilises the expertise of three partners:

1. **International Centre for Integrated Mountain Development (ICIMOD):** ICIMOD is an intergovernmental knowledge centre working on behalf of the people of the HKH, with a focus on making this critical region greener, more inclusive and climate resilient. The Centre has 40 years of experience with the Government of Pakistan.
2. **United Nations Children's Fund (UNICEF):** UNICEF is responsible for providing humanitarian and developmental aid to children worldwide. It has been instrumental in supporting the Government of Pakistan in ensuring a safe and clean community with adequate water and sanitation for every child. It is the sector lead for basic social service sectors for Pakistan's UN Sustainable Development Cooperation Framework (UNSDCF).
3. **United Nations Entity for Gender Equality and the Empowerment of Women (UN Women):** UN Women is the global champion for gender equality, developing and upholding standards and creating an environment where every woman and girl can exercise her human rights and live up to her full potential. UN Women supports the Government of Pakistan as they develop their commitments and act on gender-responsive climate change mitigation and adaptation. UN Women has been producing evidence to better understand the importance of inclusive natural resource management for sustaining peace and reducing security risks and to better understand the nexus between disaster preparedness, conflict, and gender in Pakistan.

Bringing together the combined expertise and field-level capacity of these partners, the SAFER project will deploy a set of six distinct adaptation measures (components) to empower local communities and policymakers at the provincial and national levels to adapt to the above-outlined climate change challenges:

1. **Cryosphere hazards:** CB-MEWS and site planning to reduce the loss of life and property due to cryosphere hazards in the upper basin.
2. **Drying springs:** Revived and community-managed springs to reduce water stress and improve the quality of municipal and agriculture water supplies in the mid-hills of the basin.
3. **Depleting groundwater and inadequate infrastructure:** Groundwater recharge and governance practices to reduce the depletion of the groundwater table, increasing water available for households in disaster-prone areas through green and climate-resilient water supply facilities using solar and hand pumps in the middle basin.
4. **Pollution and access to clean water:** Ecosystem-Based Adaptation in the form of constructed wetlands in the middle and lower basin to treat increasingly toxic urban effluent, decreasing pollution and water stress in the lower basin.
5. **Unsustainable water use and climate impacts:** Surface water conservation through the construction of community ponds and rehabilitation of waterways to increase water availability to water-deprived communities in the lower basin.
6. **Community resilience to climate change:** Adaptive capacities and empowered communities for strengthened resilience to climate change through technical support for developing adaptive policies, inclusive strategies, regulatory frameworks, and institutional and HR capacity building, producing, and disseminating KM products and community mobilisation for sustainable climate action.

By rooting the SAFER project in Pakistan's Living Indus Initiative, it is framed in the broader intervention logic that has been driven and is owned by the Pakistan government and benefits from coordinated support from the UN Country Team. This, combined with the system strengthening under Component 6, will ensure that these evidence-based adaptation solutions are deployed coherently at the project level and become accessible and scalable solutions for communities, development practitioners and policymakers, and also at the regional level. The idea is to reduce the costs of projects/programmes to implement climate-resilient measures in the future.

The **Theory of Change (TOC)** for the SAFER project (Annex 1) presents an impact potential that **IF** (1) the climate-induced cryosphere multi-hazard risks are reduced, (2) resilient land use planning is in place, (3) access to groundwater is increased, (4) climate adaptive WASH infrastructure is available, (5) the pollution levels and water-wastage are reduced, and (6) improved climate adaptive policy practice & community empowerment is facilitated, **THEN** the population residing in

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National Rural Support Programme (NRSP): NRSP is a not-for-profit Pakistani organisation and the most extensive rural support programme in the country in terms of outreach, staff, and development activities. NRSP's mandate is to alleviate rural poverty by harnessing people's potential and undertaking development activities in Pakistan. It has a presence in 72 Districts across Pakistan.

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Pakistan's Indus Basin will be able to reduce their climate vulnerability with increased adaptive capacity **BECAUSE** they will have the necessary resources and tools made available through the project to cope with the climate-induced stresses in terms of water quality and quantity, disasters and hydrological extremes, and burden of disease.

The TOC has been elaborated in terms of components/outcomes, outputs, and activities in the following sections while an indicative work plan for the project is given in Annex 2.

A.1. Component 1 – Cryosphere Disaster Risk Reduction (led by ICIMOD)

Outcome 1: Reduced Climate-Induced Cryosphere Multi-Hazard Risk

Output 1.1: Integrated cryosphere risk mapping through community engagement.

Activity 1.1.1. Generate hazard maps using advanced Earth Observation and GIS technology to confirm the present level of hazards upstream affecting communities in Ishkoman Valley, Manjawa Valley, Sher Qila Valley, Hasaan Abad Valley, Shimshal Valley, Bagrot Valley, Reshun Valley, Susoom Valley and Kalash Valley.

ICIMOD will generate a map of cryosphere hazards (details in knowledge products) using Landsat, Sentinel and Aster satellite data from the last 30 years and GIS technology in the valleys mentioned above and shown in Map 1. The following methodology will be used to develop each category of maps:

Glacial Lake Outburst Flood (GLOF)

Potential glacial lakes and their proximity to communities and associated infrastructure are identified. Assessment of glacial lake outburst flood involves monitoring glacial lakes, assessing triggering factors, and modelling dam breach scenarios.

Hydrodynamic modelling is used to simulate flood magnitude and timing, considering sediment-laden flow scenarios. Impact assessments on downstream communities and infrastructure are conducted based on peak flow estimates and inundation mapping. Height-Area-Volume curves and breach scenarios are generated for potential damming sites.

Potential impacts on glacial lakes, community infrastructure, ecosystem services are assessed, considering current and future climate projections.

Peak flow estimation is conducted using empirical approaches, and flow routing to downstream hydropower projects is simulated. Impact assessments are performed based on peak flow hydrographs and inundation mapping.

Permafrost

Permafrost extent maps are generated based on land surface temperature, air temperature, solar radiation data, and land cover data. Vulnerable areas with marginal permafrost are identified caused by warming up and gradual permafrost thaw which can trigger landslides, floods, and disrupt water flow.

Snow Cover

Snow cover data is developed and shared through an online dashboard to provide near real-time situation of snow to communities. The data is used for understanding the potential of avalanches, meltwater discharge, and floods in selected mountain regions.

Glaciers

A dashboard will be developed for a database of long-term changes in glaciers including historic changes, future projections and their impacts. Monitoring glaciers through community watch groups using field visits, sensors installed at selected locations, and an online platform with near real-time freely available satellite data. Identify changes and report to local authorities for necessary emergency response.

Each assessment involves a comprehensive approach integrating various data sources, modelling techniques, and scenario projections to evaluate hazards and their potential consequences for local communities and downstream populations.

Activity 1.1.2. Assess the vulnerability and exposure of communities in the selected sites. Evaluate the vulnerability and exposure of communities residing in the selected areas to understand their susceptibility to potential hazards.

This will include vulnerability to cryosphere hazards in Gilgit-Baltistan and potential study sites shown in Map 1.

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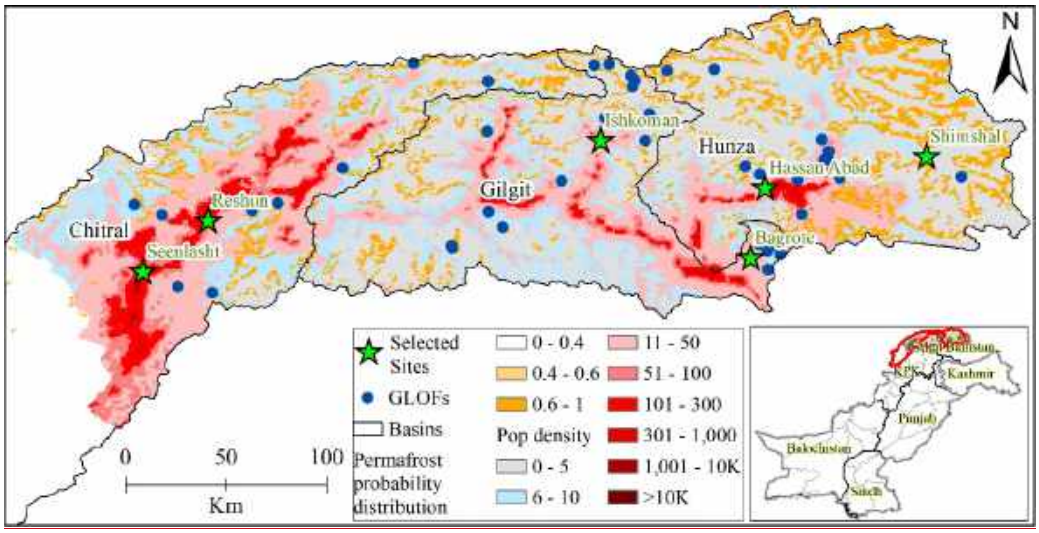
Activity 1.1.3. Conduct participatory community-level risk assessments of the targeted vulnerable communities using an existing method that has been tested in other river basins to identify potentially dangerous glacier lakes based on previous collaborative work with Aga Khan Agency for Habitat (AKAH) Pakistan and National Disaster Management Authority's guidelines in the selected sites to strengthen their resilience to climate change-induced disasters.

Implement participatory community-level risk assessments in collaboration work with AKAH Pakistan following National Disaster Management Authority's guidelines and utilising a proven method previously employed in other river basins. Identify potentially vulnerable communities through collective efforts, ensuring the selected communities are better prepared to cope with climate change-induced disasters, based on insights gained from collaborative work.

The Hazard Vulnerability and Risk Assessments (HVRAs) piloted in the mountain region of Pakistan by the AKAH comprise identification of hazards, assessment of vulnerabilities, and estimation of risks to prioritise interventions. A unique aspect of AKAH's method is the integration of Indigenous knowledge and technology, engaging local communities to understand traditional practices and technological solutions. It also develops mitigation strategies based on assessment findings, including structural and non-structural measures, and oversees their implementation while monitoring their effectiveness. Capacity building and education initiatives empower communities to proactively reduce vulnerability, ensuring a holistic approach to creating safer habitats.

Map 1: Location of Interventions to be Implemented under Component 1



Output 1.2: Community-based monitoring and early warning systems established.

Activity 1.2.1. Establish Community Watch Groups to undertake necessary preparedness actions and measures.

Community Watch Groups play a critical role in enhancing preparedness within the community. These groups are composed of individuals who are familiar with the local environment and potential hazards. They are responsible for actively monitoring changes in the environment and weather patterns, and for taking necessary actions in case of an impending hazard. By having dedicated watch groups, the community can respond more swiftly and effectively to emerging risks.

Activity 1.2.2. Prepare a participatory community monitoring plan, including the need for contextually appropriate technological measures that supplement monitoring by community members.

A participatory approach involves actively involving community members in the monitoring process. This means that the community itself contributes to the identification of hazards, the selection of monitoring methods, and the decision-making process. The plan also includes the use of appropriate technology to

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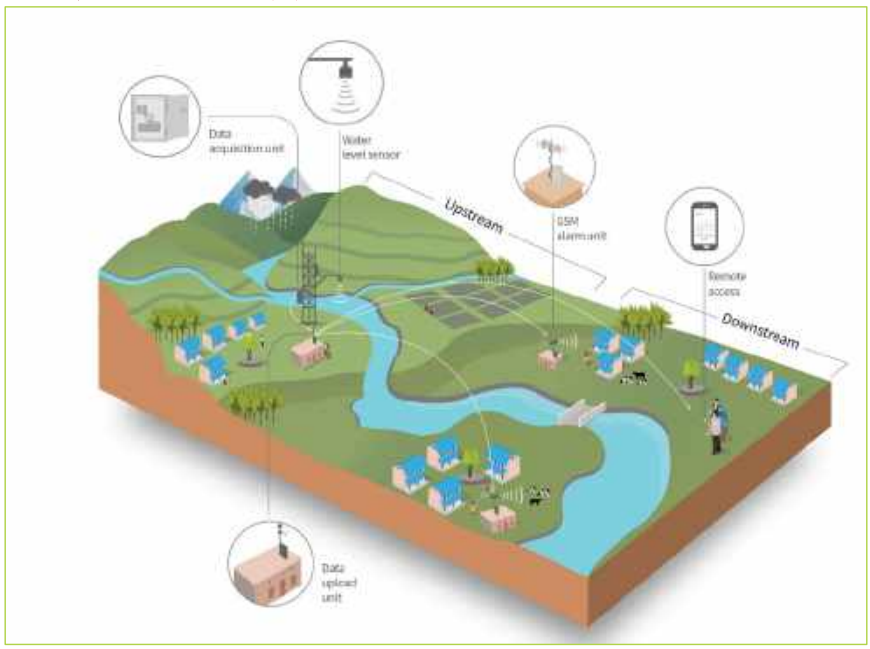
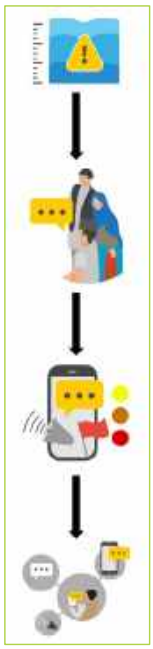
supplement the efforts of community members. The implementation of advanced technologies provides a significant boost to the community's monitoring capabilities. These technologies may include sensors, early warning systems, and data analysis tools that offer real-time information about potential hazards. The community members will be trained to monitor the lakes, identify potential hazards, and make necessary preparations using both in-situ methods and satellite information. This combination of local knowledge and technology ensures a comprehensive and reliable monitoring system, and the community can receive timely and accurate warnings, allowing for more effective preparedness and response actions.

Activity 1.2.3. Co-design and establish a gender-responsive CB-MEWS[25] based on Output 1.1 for hazards such as permafrost-triggered GLOFs, glacial floods, landslides, rainfall-induced floods, and avalanches.

Recognising that different genders may have specific vulnerabilities and needs during hazardous events such as permafrost-triggered GLOFs, glacial floods, landslides, rainfall-induced floods, and avalanches, the CB-MEWS (Figure 2) is designed with a gender-responsive approach. This means that it considers the specific challenges faced by different genders in the community. It may include measures to ensure the safety and wellbeing of women, children, and other vulnerable groups during emergencies.

Figure 2: Schematic Diagram of a Community-Based Early Warning System





Activity 1.2.4. Deploy the identified technology to enhance monitoring and increase warning time.

Activity 1.2.5. Prepare evacuation plans in response to potential cryosphere-related hazards and establish evacuation routes and shelter zones cooperating with the respective Disaster Management Agencies.

The plan will address communication and information dissemination, evacuation, search, and rescue, first aid and health, transportation, shelter management, safe drinking water and sanitation, provision of relief, and collection of data systematically. Evacuation plans are crucial for ensuring the safety of community members during hazardous events. These plans are comprehensive, covering various aspects of the evacuation process, including communication strategies, shelter management, provision of essential relief

[25] Refer to Community Based Flood Early Warning System for the Hindu Kush Himalaya: Resource Manual | HimalDoc (icimod.org) for detailed process, and the gender specific methodological details can be found in Multiscale Integrated River Basin Management Module 3.

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items through the support of local disaster management authorities, and systematic data collection. This ensures that the evacuation process is well-organised and prioritises the wellbeing of all individuals.

Activity 1.2.6. Establish networking and communication channels to disseminate early warning information in a larger network to provide lead time for preparedness.

Effective communication is key during emergencies to disseminate early warning information in a larger network to provide lead time for preparedness. This sub-component focuses on creating a robust network of communication channels within the community and potentially extending it to a larger network of stakeholders. This ensures that early warning information reaches all relevant parties in a timely manner, providing them with the necessary lead time to take preparatory actions.

Activity 1.2.7. Combine CB-MEWS with real-time satellite data for timely risk identification and communication. Integrating CB-MEWS with real-time satellite data enhances the accuracy and timeliness of hazard identification and communication.

Satellite data can provide a broader perspective and complement the localised information gathered by the community-based system. This integration ensures a more comprehensive understanding of potential risks.

Activity 1.2.8. Build community capacity to understand and respond to potential hazards (using existing committees on Community-Based Disaster Risk Management – CBDRMs) and community-based hazard monitoring and risk resilience in cooperation with the respective Disaster Management Agencies.

Strengthening the community's capacity to understand and respond to hazards is a fundamental aspect of resilience building. This sub-component leverages existing CBDRM practices, which are community-driven initiatives focused on risk reduction. By collaborating with local Disaster Management Agencies, the community gains access to resources, expertise, and support to effectively implement these capacity-building measures.

Activity 1.2.9. Integrate long-term sustainability of the CB-MEWS through creating DRR basket funds and including the CB-MEWS approach in the DRR plan of local government, and respective Disaster Management Agencies. Ensuring the long-term effectiveness of the CB-MEWS involves strategic planning and integration into broader DRR efforts.

This includes establishing DRR basket funds, which allocate resources specifically for risk reduction initiatives. Additionally, incorporating the CB-MEWS approach into the local government's DRR plan and the plans of respective Disaster Management Agencies ensures that it becomes an integral part of the community's ongoing preparedness efforts.

Output 1.3: Strengthened resilience to cryosphere-related risks

Activity 1.3.1. Engage local leaders and policymakers to incorporate cryosphere-related risk in flood zonation and infrastructure planning.

Engaging local leaders and policymakers is a crucial step in enhancing disaster preparedness. This involves actively involving influential figures within the community and local government in understanding and addressing cryosphere-related risks. By incorporating these risks into flood zonation and infrastructure planning, the community can strategically allocate resources and design infrastructure that considers potential hazards associated with cryosphere events.

Activity 1.3.2. Leverage the evidence on emerging hazards to formulate recommendations on disaster response standard operating procedures and advocate for their implementation with local authorities.

This activity focuses on leveraging evidence regarding emerging hazards to develop specific recommendations for disaster response standard operating procedures. These procedures serve as a set of established protocols and guidelines for how to respond effectively in the event of a disaster. Advocating for the implementation of these procedures with local authorities ensures that there is a standardised and coordinated response in place, which can significantly improve the community's ability to manage and recover from disasters.

A.1.1. Implementation Modality and Stakeholder Engagement

ICIMOD, along with government agencies like National Disaster Management Authority (NDMA), Provincial Disaster Management Authorities (PDMAs), Local Government Department and Pakistan Meteorological Department (PMD), civil society partners like Aga Khan Agency for Habitat (AKAH), Mountain and Glaciers Protection Organisation (MGPO), local mountain communities, and private sector vendors, will execute this component using advanced Earth Observation and GIS technology for hazard mapping and vulnerability assessments. The MGPO and AKAH will provide support to map vulnerable infrastructure, facilitate community engagement, and develop disaster response protocols. ICIMOD will provide

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technical support, generate cryosphere-hazard knowledge products, and conduct mapping and assessments. PDMAs will participate in adaptation strategy development and ensure quality assurance. The PMD will complement the project and provide meteorological data. Mountain communities and Community Watch Groups will conduct surveys, participate in monitoring systems, and disseminate early warnings. Local government offices will coordinate activities and establish evacuation plans. The private sector will develop integrated platforms for real-time data. NGOs and PDMAs will support capacity building and community mobilisation. The Global Change Impacts Studies Centre (GCISC), based in Pakistan, will develop SOPs for climate and hazards modelling.

All stakeholders will contribute to existing coordination platforms to ensure effective communication and collaboration, integrating project activities into broader disaster risk reduction frameworks. Through this collaborative approach, SAFER aims to make communities resilient and capable of responding to climate-induced cryosphere hazards, reducing loss of life and property in Pakistan's mountain regions.

A.1.2. Site Selection Criteria[26]

- **Existence of potentially dangerous glacier lakes:** Meltwater from retreating glaciers often forms a glacier lake (usually moraine-dammed or ice-dammed). The GLOFs database and other lake inventories are used to pinpoint certain characteristics, including lake location, area, modelled or measured volume in some cases, and elevation. This information is used to identify glacier lakes that have the potential to cause GLOFs. Extensive lakes with an area of more than 200,000 square metres, with a history of past damage from flooding events. Large glacier lakes with a history of causing significant damage to infrastructure and property demand particular attention and require targeted interventions.
- **A history of recurring floods, GLOFs and glacial floods:** Past events can provide valuable data on the frequency, magnitude, and impact of GLOFs, and glacial floods from subsurface water bodies to aid the development of appropriate response strategies.
- **Vulnerable community downstream:** The existence of downstream communities and infrastructure that are vulnerable to potentially dangerous glacier lakes is vital. The presence of densely populated areas and critical infrastructure (e.g., roads, bridges, power plants, and agricultural land), necessitate priority interventions.
- **Permafrost or potential risk of debris flow:** The presence of permafrost in the region can amplify the risk of debris flows, which GLOFs and other hazards may trigger. Permafrost or frozen ground is extensive at high elevation in this region. The combination of thawing permafrost near a glacier lake increases the potential danger and needs to be considered when developing strategies to manage cryosphere hazards.
- **Physical accessibility:** This criterion ensures that the selected sites have good physical access, which is crucial for effective DRR efforts.
- **Multi-hazard approach:** the ability to assess the potential overlap or interaction of cryosphere-related hazards with other types of natural hazards (e.g., landslides, avalanches, glacier surges, and permafrost thaw) to develop comprehensive risk reduction strategies.

Map 6 illustrates the most vulnerable areas selected for the study under Component 1 through the consultative process**Error! Reference source not found.**

A.2. Component 2 – Springshed Revival and Management (led by ICIMOD)

Outcome 2: Increased access to spring water in a climate-adaptive and gender-inclusive manner

Output 2.1: A comprehensive web-based information management system of springsheds and springs prepared for Malakand and Hazara divisions

Activity 2.1.1. Compile Springs Inventory and a web-based information system (GPS location, biophysical characters, gender-social and economic information).

The primary aim of this activity is to comprehensively understand the intricate dynamics of the water patterns of springs and associated practices within the context of climate and environmental shifts in the KP Province (Figure 3). Importantly, the component aims to measure the impact of springshed management not only on the resource itself and water supply but also on broader ecosystem services, biodiversity, and social aspects such as equitable benefit sharing and empowerment of marginalised groups, ensuring a holistic understanding for effective revitalisation strategies. Figure 4 presents an example of a spring map from Nepal. A spring inventory is prepared using a mobile application developed by ICIMOD. Community resource persons are trained and employed for mapping springs. The data is linked to an online HKH

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springs portal (http://hkhsprings.icimod.org/). A similar process will be applied for the SAFER project but the inventory process will be customised according to the Pakistan context.

Figure 3: Schematic Diagram of a Springshed

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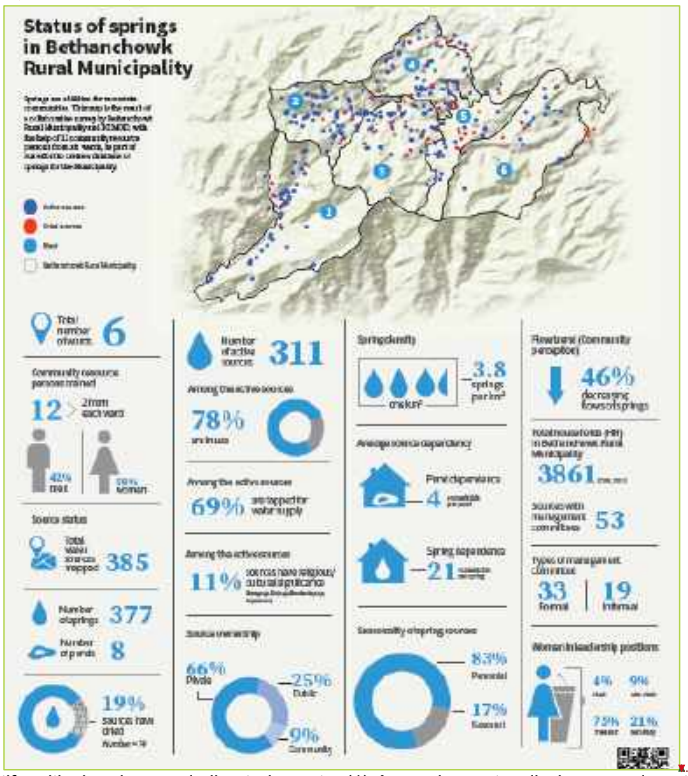
Figure 4: Example of Springshed Inventory



Activity 2.1.2. Identify critical springs and climate impacts: (1) Assessing water discharge and contribution to rural and municipal water for life and livelihoods; and (2) Climate change impact assessment on the identified vital/crucial springs.

These comprehensive springs assessment studies involve analysing historical data and employing downscale climate projections to understand shifts in water availability, timing of spring flow, and broader hydrological dynamics. Simultaneously, they aim to gauge the impacts of springshed management by assessing alterations in the underlying aquifer resources supporting the springs, the supply and demand dynamics of spring water for users, and the consequent changes in ecosystem services such as biodiversity, climate-related benefits from improved vegetation and erosion reduction.

Activity 2.1.3. Prepare participatory hydrogeological maps: (1) Study of rocks, rock structures, and streams; (2) Geological cross-sections.

Figure 5 presents an example of a hydrogeological map showing the recharge area of a spring in Nepal (Source: https://lib.icimod.org/record/35671). The same technique will be used for developing hydrological maps of springsheds which will be recorded into an inventory of springsheds.

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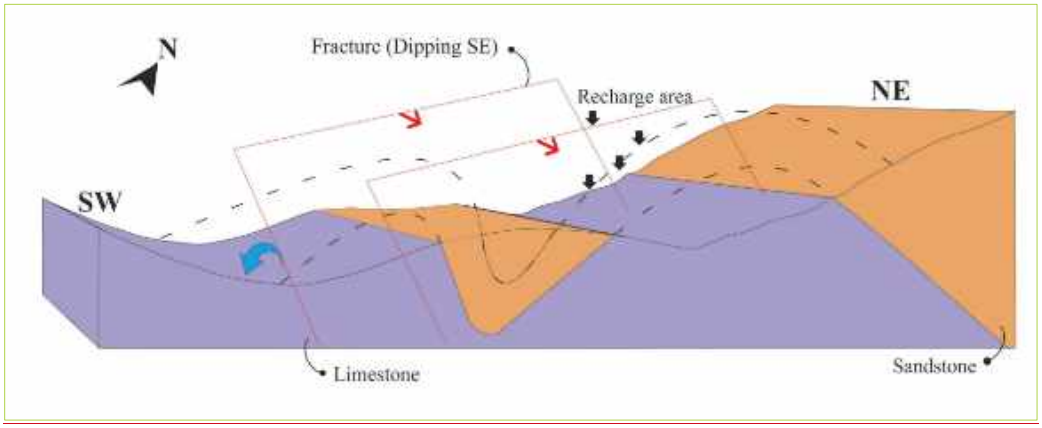
Figure 5: Hydrogeological Conceptual Layout of Spring with Recharge Area Demarcation



Output 2.2: **Recharge measures (for improved springshed practices, land use planning, and bioengineering) co-developed and implemented**

The planned recharge measures will include (Figure 6):

- **Recharge Pits and Trenches:** These structures are designed to enhance groundwater recharge. By capturing and directing rainwater into the ground, recharge pits and trenches help increase the quantity of water available in springs, thus stabilising and improving spring discharge.
- **Absorption Terraces and Small Ponds** are used to slow down water runoff and allow more water to percolate into the soil, thereby increasing groundwater levels and enhancing spring discharge. These measures are part of rainwater harvesting techniques aimed at improving water availability in springs.
- **Vegetative Check Dams and Contour Trenches:** These structural measures are implemented on gentle slopes to facilitate the infiltration of rainwater into the ground. They aid in recharging groundwater and help in reducing soil erosion, thereby contributing to the stability and quality of spring water.

Activity 2.2.1. Co-design recharge solutions based on a participatory approach supported by science and evidence collected through Output 2.1.

On-ground interventions such as recharge pits, trenches, absorption terraces, small ponds, and check dams play a crucial role in increasing spring discharge quantity and quality. These interventions are part of a broader approach known as 'rainwater harvesting or groundwater recharge techniques' (Figure 6). A set of NbS in the local context will enhance the quantity and stability of spring discharge and also improve its water quality. The following images show a few examples of vegetative check dams, contour trenches, shallow recharge ponds, which are some of the structural measures that can be applied on gentle slopes for recharging springs (Photos: ICIMOD).

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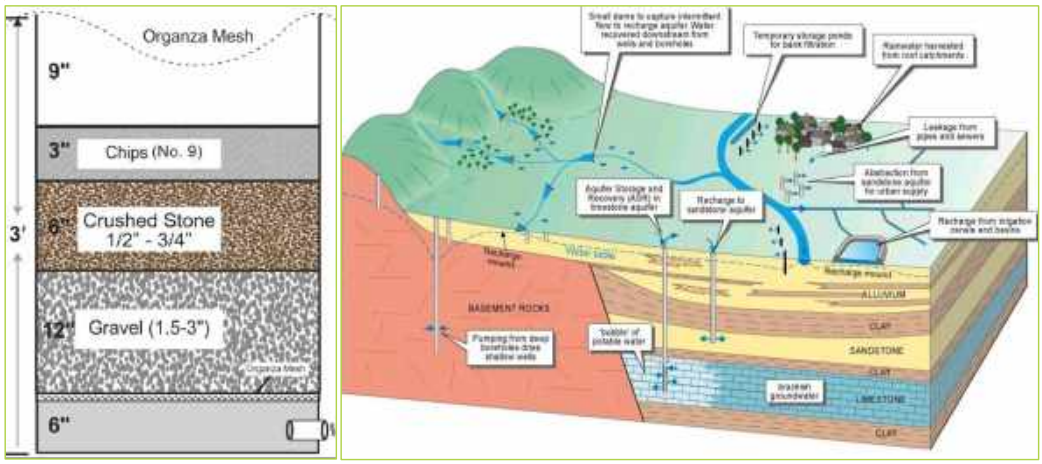
Figure 6: Water Recharge Structures



Activity 2.2.2. Support the local monitoring of spring revival and groundwater recharge activities.

Continued monitoring activities described in the steps above are necessary to correctly gauge and understand the impacts of the springshed management practice and groundwater recharge intervention and adjust accordingly, enabling resilience-focused local decision-making.

Activity 2.2.3. Install Data Monitoring Systems in select pilot communities to collect long-term spring discharge data, groundwater levels, water quality information, and rainfall data in a participative manner.

Figure 7 shows how the results from a data monitoring system are presented through a dashboard. It depicts changes in the flow of a spring in Sikkim, India, before and after recharge measures (Source: Spring project, ICIMOD).

Activity 2.2.4. Promote community-led springs management (e.g., Springs User Groups) and deliver the springshed management and monitoring training to community members in the selected communities for operations, maintenance and equitable benefit sharing in a gender-inclusive manner.

The primary purpose of promoting community-led springs management, such as establishing Springs User Groups and providing training on existing springshed management and monitoring to community members, is to foster local engagement and empowerment in the sustainable stewardship of the springs. By involving the community directly, this initiative aims to build capacity and knowledge among individuals living in the selected communities. Multiple stakeholders, including local communities will be involved in the decision-making process related to water allocation and management to foster inclusive and transparent governance, empowering communities to actively participate in water-related decisions.

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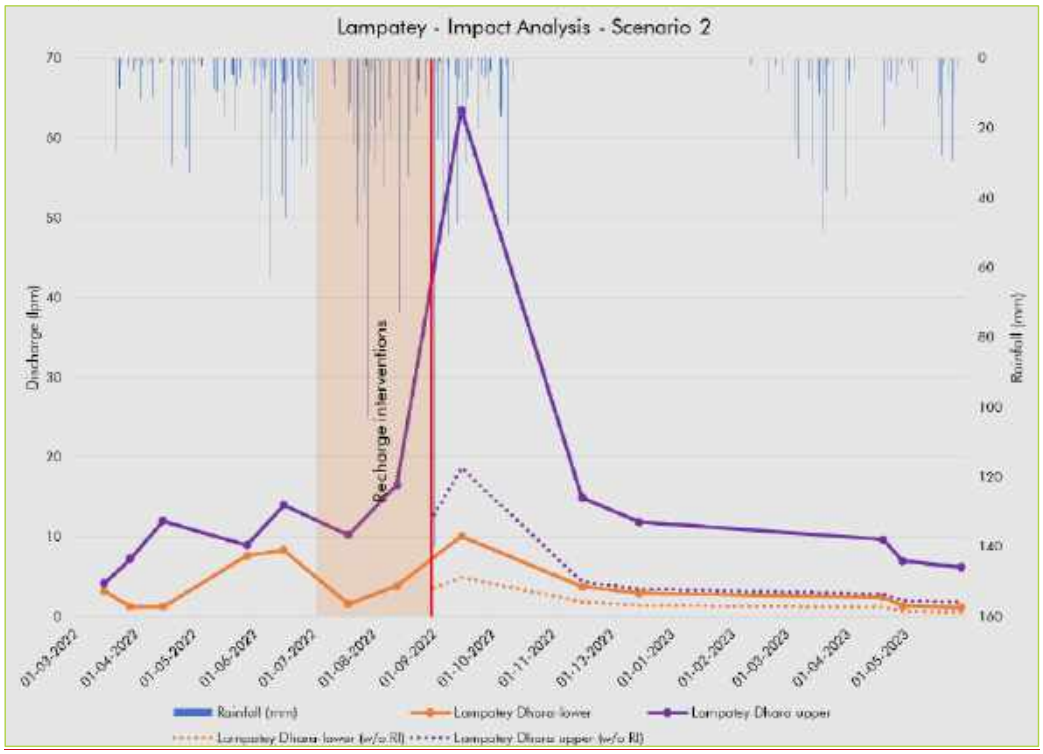
Figure 7: Dashboard showing Data Monitoring Results



Output 2.3: Local governance framework for springshed established with enhanced institutional capacity for efficient water resource management

Activity 2.3.1. Document cost-benefit analysis and impact assessment

Documenting cost-benefit analysis and impact assessments within the SAFER project's innovative programme provides crucial evidence for scaling and ensuring sustainability in several ways. By showcasing the costs incurred against the tangible and intangible gains provided evidence-based data that can be shared with policymakers, organisations, and other communities interested in implementing similar interventions. It will also help to refine strategies for future projects by learning from the documented successes and challenges, thus increasing the potential for sustained impact and long-term sustainability.

Activity 2.3.2. Co-develop guidelines and protocols for local-level management and operations to support responsible and sustainable use of spring water resources

The issues related to resource protection, allocation and permits, monitoring and enforcement, conservation and efficiency and adaptive management will be addressed in this component of adaptation actions.

Activity 2.3.3. Strengthen policy, regulation, and governance

In this activity, issues related to legal frameworks, regulations, institutional structures, allocation and prioritisation, and compliance will be addressed locally and linked to Component 6 at the national and provincial levels, integrating springs water governance mechanisms into national water policies and regulations.

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A.2.1. Implementation Modality and Stakeholder Engagement

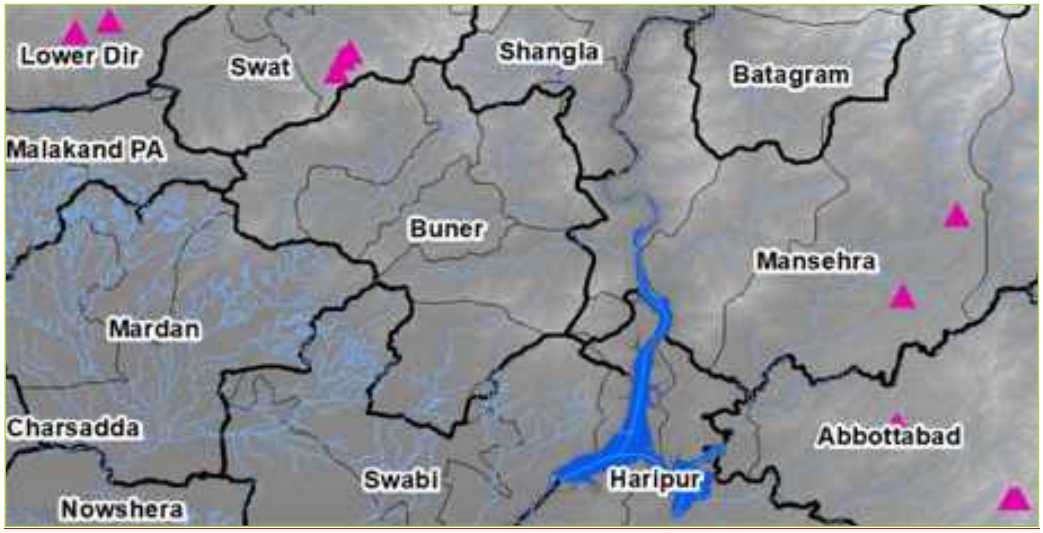
ICIMOD will execute Component 2, Springshed Revival and Management, implementing activities in collaboration with related government agencies, such as KP Directorate General of Soil and Water Conservation (DSWC) and Climate Energy & Water Research Institute (CEWRI), and civil society partners who are already in partnership with ICIMOD to provide technical support through strong field presence in the target locations. DSWC will review and endorse technical designs, monitor quality assurance, and certify nature based solutions (NbS). Civil society groups will play a vital role in social and community mobilisation, as well as capacity building of the management committees. The project will also integrate with existing provincial and district coordination platforms to ensure informed stakeholder engagement for successful implementation of the outputs.

A.2.2. Site Selection Criteria

- Springs that are essential to municipal water supplies
- Sites that would provide the largest potential impact in terms of beneficiaries reached.

Sites selected under Component 2 based on the consultative process are shown on Map 2 and detailed in Annex 6.

Map 2: Location of Interventions to be Implemented under Component 2



A.3. Component 3 – Groundwater Management and Resilient Community Water Supply Services (led by UNICEF)

Outcome 3: **Improved climate-resilient management of groundwater and community water supply services in vulnerable areas.**

Output 3.1: **Groundwater mapping and groundwater recharge facilities completed in selected water-scarce locations in the middle basin, including establishing/ strengthening operation, maintenance, and management structures.**

The groundwater resource potential is overstretched due to high extraction of water for different uses for livelihoods. This resulted in lowering of the water table and caused the failure of different tube wells. The purpose of the groundwater recharge facility is to increase the groundwater potential through construction of inverted wells, boreholes or ponds with a filtration mechanism to recharge the aquifer.

Activity 3.1.1. Conduct comprehensive groundwater study and mapping in Swat district of Khyber Pakhtunkhwa province.

Activity 3.1.2. Conduct a feasibility study and identify six sites for the construction of groundwater recharge facilities.

Activity 3.1.3. Construct ditches and trenches designed to suit the topographic and geological conditions of selected sites to increase the volume of runoff recharging the groundwater.

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Activity 3.1.4. Install water quality meters to ensure avoiding maladaptation of contaminating the groundwater.

Activity 3.1.5. Establish and train community-based structures for the operation and maintenance of the facilities.

Activity 3.1.6. Develop technical training courses for technicians and operators of Sindh and KP Local Government Academies, along with technical backstopping with the collaboration of academia.

Output 3.2: Climate-smart and resilient water supply infrastructure established in selected sites, along with contextually relevant management structures with adequate capacity for operation and maintenance of the community infrastructure.

Activity 3.2.1. Conduct an assessment of flood-affected community water supply systems in six flood-affected districts of Sindh Province and identify vulnerable locations not covered by other interventions.

Activity 3.2.2. Construct/upgrade 100 solar-powered water facilities (Figure 8) benefiting 150,000 people in Mirpurkhas, Umerkot, Sujawal, Badin, Khairpur and Sukkur districts of Sindh and Charsadda, Swat and Nowshera districts of KP Province.

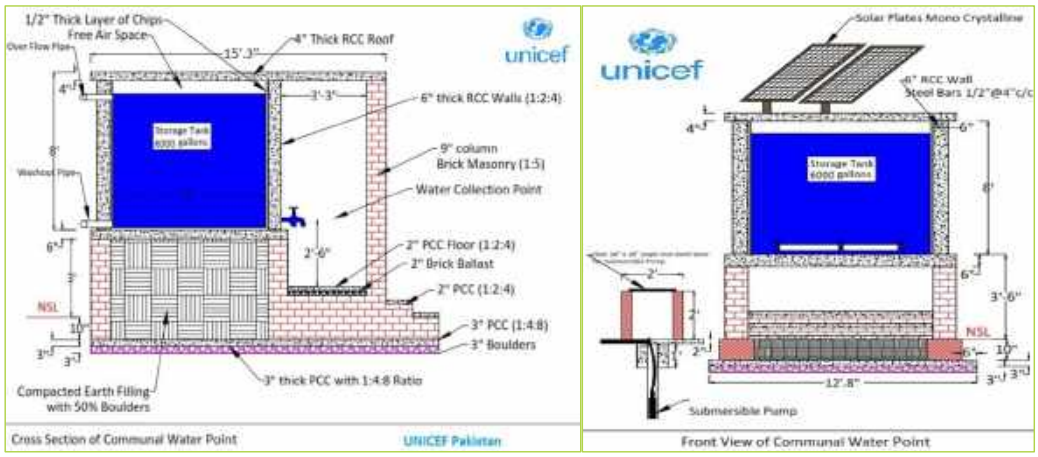
A solar water point is a communal water supply facility in a village or community to provide safe drinking water to the target community. The system is provided with taps where water is collected for drinking. Unlike a conventional system, the scheme is run by a solar power system which reduces the cost of operations and is a climate-adaptive solution for low carbon emissions.

Activity 3.2.3. Install 60 climate-resilient handpumps together with lead pipelines benefitting 15,000 people in Mirpurkhas, Umerkot, Sujawal, Badin, Khairpur and Sukkur districts of Sindh to build back better in flood-affected areas.

This is a water facility provided at a communal place in the community to obtain improved water for general use including for drinking. Lead line handpumps are provided to villages, where the underground water source is saline. In consultation with communities, borehole sites are identified at specific sites or near a surface water source and fresh water is brought to through village/ community through a lead line pipe.

Activity 3.2.4. Establish/strengthen community water management structures, including training WASH committees and local technicians.

Figure 8: Communal Water Point



A.3.1. Implementation Modality and Stakeholder Engagement

UNICEF will be the executing agency for Component 3 and will implement activities in partnership with its existing civil society partners and have technical capacities and a strong field presence in the target locations. For construction activities, UNICEF will be hiring contractors through a competitive process under Long-Term Agreements with UNICEF. The key stakeholders for this component will be Public Health Engineering Departments (PHED) in KP and Sindh, Deputy Commissioner offices, local communities and other UN and NGO partners working in the area. The PHEDs will review and approve technical designs, carry out monitoring, quality assurance, certification and approval of construction works. The Deputy Commissioner offices will have a day-to-day coordination role in their respective districts and facilitating community

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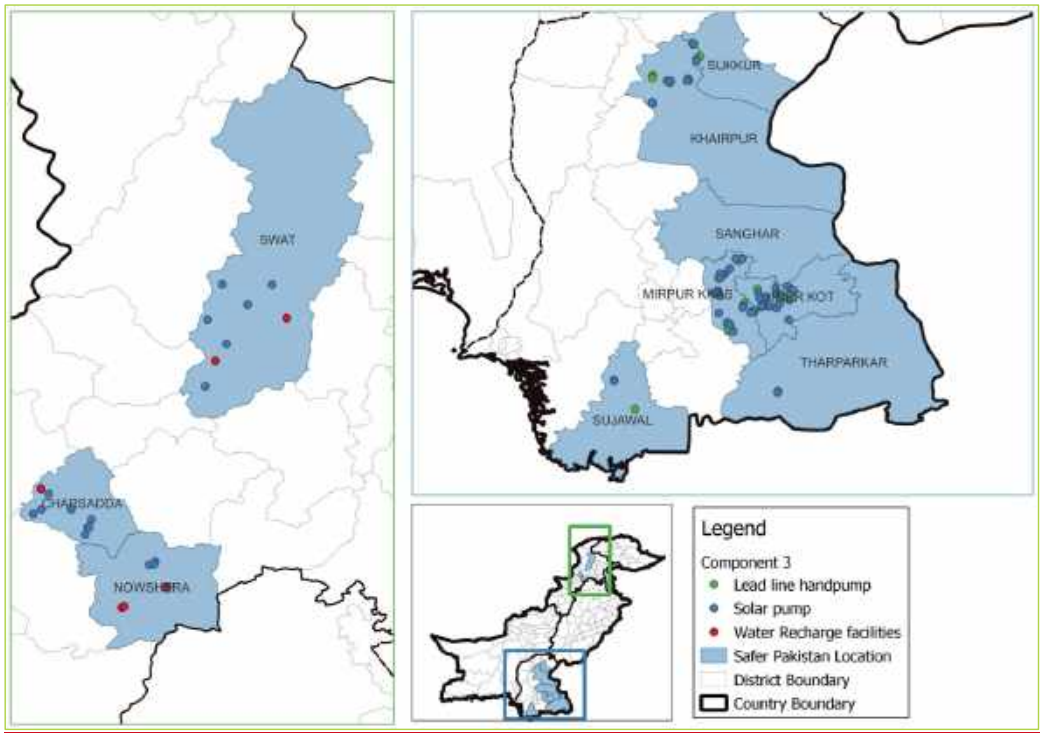
engagement. The civil society groups will facilitate the social and community mobilisation, and capacity building of the management committees. The project will also be included in the existing provincial and district coordination platforms where all other stakeholders are informed and contribute to the successful implementation of the outputs.

A.3.2. Site Selection Criteria

- For groundwater mapping and recharge – locations with low groundwater yield and high groundwater depletion and limited alternative water sources affected water supply services.
- For climate-resilient water facilities – communities and water supply services affected/prone to flooding, availability of groundwater resources, locations not covered by PHED water supply systems and other IFI and government projects.

Sites selected under Component 3 based on the consultative process are shown on Map 3 and detailed in Annex 6.

Map 3: Location of Interventions to be Implemented under Component 3



A.4. Component 4 – Ecosystem-based Adaptation (led by UNICEF)

Outcome 4: WASH infrastructure in the targeted communities in the Middle Indus Basin is more adaptive to climate change-induced shocks with scaling up of the contextually appropriate NbS.

Output 4.1: Targeted intervention sites identified for evidence-based, climate adaptive and focused WASH interventions.

Activity 4.1.1. Conduct secondary WASH, environment, and climate change data analysis, including targeted impact forecasts under RCP 4.5 and 8.5, for identification of target locations.

Activity 4.1.2. Undertake site-specific environmental and feasibility assessments while ensuring the contextual appropriateness of the intervention at eight selected sites in Charsadda, Swat and Nowshera districts of KP Province and Sukkur and Khairpur districts of Sindh Province sit, including vegetation selection.

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Output 4.2: **NbS for sewage treatment demonstrated through constructed wetlands along with proper management structures and adequate capacity for operation and maintenance of wetlands.**

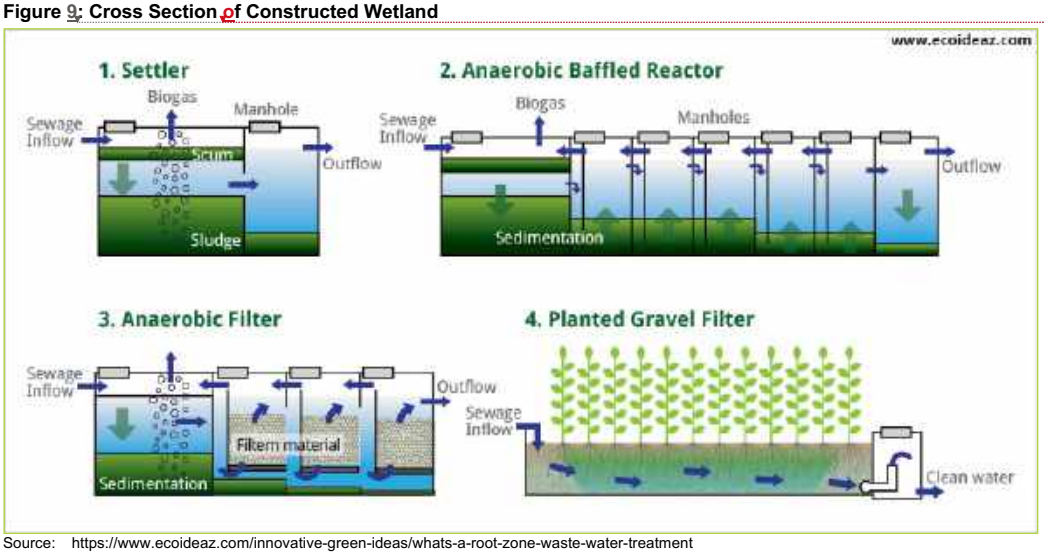
Activity 4.2.1. Install constructed wetlands (Figure 9) in eight selected sites benefitting 22,400 people in the Charsadda, Swat and Nowshera districts of KP Province and Sukkur and Khairpur districts of Sindh Province based on proven UNICEF methodology, reducing urban effluent, and increasing water availability.

The purpose of this facility is to treat the effluent or waste and storm water and reuse the water for other purposes. The constructed wetlands are the most preferred option for water treatment where there is a minimal space, especially near urban/ peri urban areas. The treated water is used for gardening, farming and other similar uses. The constructed Wetland is also a climate-adaptive solution which helps to reduce the burden on groundwater resources.

Activity 4.2.2. Strengthen existing government and community structures to operate and maintain the wetlands.

Activity 4.2.3. Provide technical support, innovative and lateral-learning platform, and equipment to service providers unable to operate Sewage Treatment Plants (STPs).

Figure 9: Cross Section of Constructed Wetland



Source: https://www.ecoideaz.com/innovative-green-ideas/whats-a-root-zone-waste-water-treatment

A.4.1. Implementation Modality and Stakeholder Engagement

UNICEF will be the executing agency for Component 4 and will implement activities through its civil society partners who already have partnership with UNICEF and have technical capacities and a strong field presence in the target locations. For construction activities, UNICEF will be hiring contractors through a competitive process under Long-Term Agreements with UNICEF. The main stakeholders for this component will be Local Government Departments and Environment Departments in KP and Sindh, Deputy Commissioner offices, local communities, academia and research institutes and other UN and NGO partners working in the area. Academia and research institutes will be engaged on the feasibility study and designing the interventions. The Local Government Departments in coordination with Environment Departments will have roles in reviewing and approving technical designs, monitoring and quality assurance and certification and approval of construction of wetlands. The Deputy Commissioner offices will have day-to-day coordination roles in their respective districts and facilitating community engagement. The civil society groups will facilitate the social and community mobilisation and capacity building of the management committees. The project will also be included in the existing provincial and district coordination platforms where all the other stakeholders are informed and contribute to successful implementation of the outputs.

A.4.2. Site Selection Criteria

- Locations where untreated sewage is released to streams and open ponds close to settlements, causing high pollution of the environment and pose an increased health risk.
- Locations where there is space and community willingness to participate in the implementation of constructed wetlands.s

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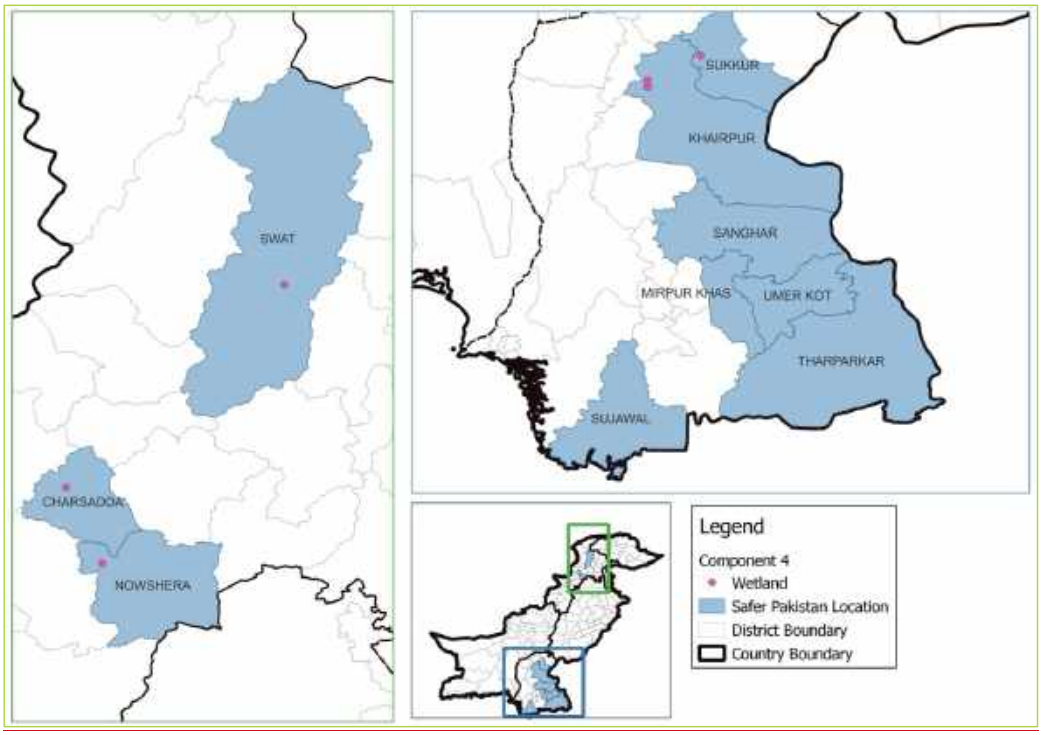
Sites selected under Component 4 based on the consultative process are shown on Map 4 and detailed in Annex 6.

Map 4: Location of Interventions to be Implemented under Component 4



A.5. Component 5 – Surface Water Conservation (led by UNICEF)

Outcome 5: **Community and institutional capacity to reduce surface water waste and increase its storage for productive use is increased, allowing communities to adapt to climate-induced shocks.**

Output 5.1: **Government of Sindh supported in systematically prioritising 15 natural waterways and community water ponds to address water storage and wastage issues.**

Activity 5.1.1. Undertake comprehensive study on natural waterways and community ponds through local ground-truthing of catchment and feasibility studies for designing, construction/upgrading of ponds, including lining, silt traps, water filtration units, and water collection points with hand/and solar pumps.

Activity 5.1.2. Detailed designs and Bills of Quantities (BOQs) for 15 community pond sites, including site plans.

Output 5.2: **15 selected waterways/ponds in Sindh Province restored/rehabilitated, including installation of water quality monitoring systems and establishing and strengthening operation, maintenance, and management structures.**

Waterways/*Doras*: This climate-adaptive solution can be implemented in areas where the land is flat and drainage of flood water is a serious issue to people's livelihoods (including damage to farms) and environment, creating negative health effects like vector-borne diseases. These facilities can be implemented as a combination or alone and include embankments, retaining structures and culvert structures provided on Waterways for efficient drainage of the flood water.

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Ponds: This facility is provided in areas with lower rainfall and an acute shortage of water for livelihoods. The facility is provided in water catchment areas duly protected from external contamination and includes slow sand filtration mechanism for improved water for communities.

Activity 5.2.1. Restore/rehabilitate selected natural waterways in the Sujawal, Umerkot, Sanghar, and Tharparkar districts of Sindh.

Activity 5.2.2. Install automatic water quality monitoring systems to ensure real-time monitoring in the target catchment location.

Activity 5.2.3. Construct/upgrade 15 communal ponds benefitting 30,000 people in the Umerkot, Sanghar, Sujawal and Tharparkar districts of Sindh.

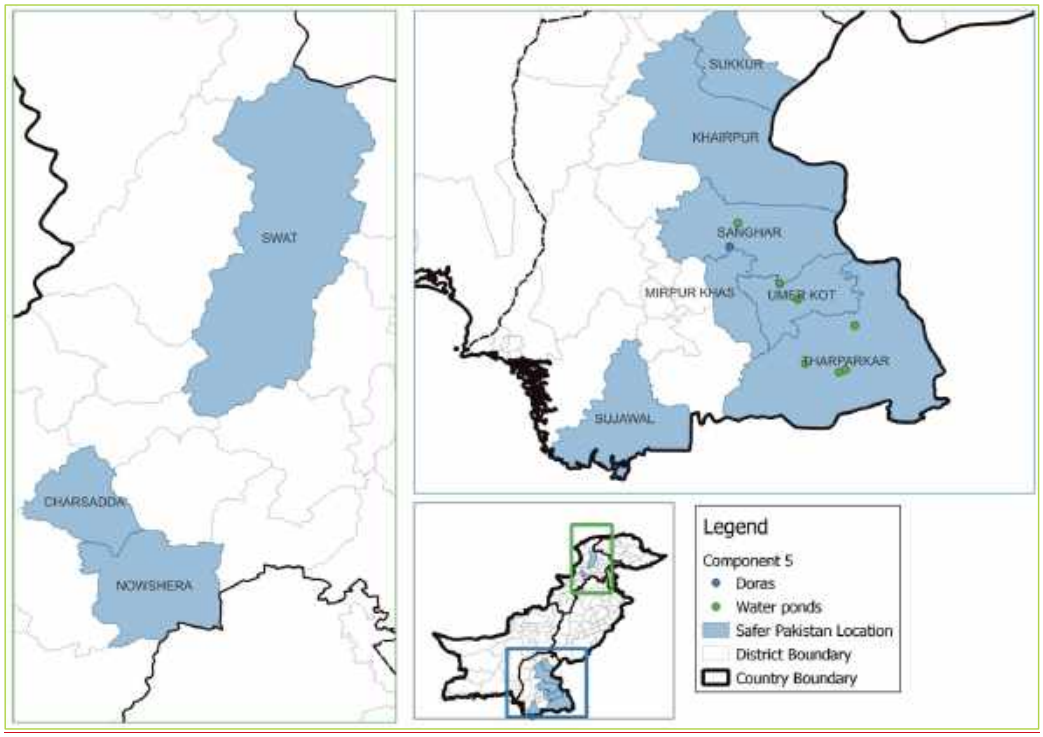
Activity 5.2.4. Establish communal pond management committees, which will be implemented as a pilot project to promote climate adaptation by communities to ensure water supply during drought which is becoming more and more unpredictable due to ongoing climate change.

A.5.1. Site Selection Criteria

- Locations where flood water from natural streams have breached settlements due to various human activities – Dhoras.
- Locations with very high groundwater salinity and limited fresh water available for domestic use.
- Locations feasible for construction/upgrading of community ponds.

Sites selected under Component 5 based on the consultative process are shown on Map 5 and detailed in Annex 6.

Map 5: Location of Interventions to be Implemented under Component 5



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A.5.2. Implementation Modality and Stakeholder Engagement

UNICEF will be the executing agency for Component 5 and will implement activities through different modalities using its civil society partners who already have an existing partnership with UNICEF, technical capacities and a strong field presence in the target locations. For construction activities, UNICEF will be hiring contractors through a competitive process under Long-Term Agreements with UNICEF. The main stakeholders for this project activity will be local government and irrigation departments in Sindh, District Commissioner offices, academia and research institutes, local communities and other UN and NGO partners working in the area. Academia and research institutes will be engaged on the feasibility study and design of the interventions. The irrigation departments will have roles in reviewing and approving technical designs, monitoring, quality assurance, certification and approval of construction works. The District Commissioner offices will have a day-to-day coordination role in their respective districts and facilitate community engagement. The civil society groups will facilitate the social and community mobilisation, and the capacity building of management committees. The project will also be included in the existing provincial and district coordination platforms where all the other stakeholders are informed and contribute to successful implementation of the outputs.

A.6. Component 6 – Adaptive Capacities and Empowered Communities for Strengthened Resilience to Climate Change (led by UNICEF and UN Women)

The scope of Component 6 is primarily the 'whole basin', but secondarily, it is national. It is fully integrated into the Government of Pakistan's Living Indus Initiative.

Outcome 6: Improved knowledge and practices of communities and policymakers on climate change adaptation and climate risk reduction.

Output 6.1: National and provincial capacities strengthened to apply innovative social and technological tools for establishing and enforcing human-centred and gender-transformative systems of climate change adaptation and accelerating the progress towards the management of Indus water resources.

Activity 6.1.1. Identify and mobilise a core group of partners (change leaders) including relevant government departments from national and provincial levels and citizens, especially young experts and women, to establish sense of urgency and support for testing and applying new adaptation social innovation approaches and tools for climate change mitigation and adaptation that will serve as transformational measures towards a meaningfully inclusive and conflict-sensitive approach.

Activity 6.1.2. Conduct a series of workshops to provide the core group of partners with understanding of and skills for applying new social technologies and inclusive and human-centred approaches. This is so that the core group can lead the testing of new approaches to groundwater policies and regulations in Sindh and KP provinces.

Activity 6.1.3. Support the core group of partners to conduct a gap analysis of groundwater legislation at the provincial and federal levels that include an analysis of gender sensitivity and climate security stressors, aspects of the current policies and regulations, including recommendations for tangible actions for drafting new groundwater acts in KP and Sindh provinces.

Activity 6.1.4. Support the core group of partners in the co-development of participatory and gender-responsive water management adaptation plans with target communities that foster the constructive resilience of communities and individuals and address climate security stressors.

Activity 6.1.5. Identify and document the lessons learned from the testing process and support the core group of partners to showcase the results to water sector stakeholders in Sindh and KP provinces and national partners, especially the government departments from different provincial/area governments, that supports enhanced coordination amongst different stakeholders.

Activity 6.1.6. Facilitate improved knowledge and practices of policymakers on WASH and climate change through training and institutional support.

Output 6.2: National and provincial stakeholders have access to strengthened evidence-based data and knowledge for informed decision-making and implementation of climate adaptation and mitigation that foster collaboration across sectors

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Activity 6.2.1. Undertake district-level training sessions in 15 districts of the proposed project in Sindh, KP and GB provinces to train the district government staff in data collection and data entry in Clean Green Pakistan Index (CGPI) web portals.[27]

Activity 6.2.2. Conduct a participatory review of potential adaptation measures (adaptation, coping and recovery) of communities in GB, KP and Sindh (NbS and EbAs across all the project components), especially identifying community adaptation solutions of youth and women that can be replicable in other contexts.

Activity 6.2.3. Create a comprehensive database of all climate-adaptive NbS and EbA technologies used in the Indus Basin, their cost, efficacy, and contextual prerequisites.

Activity 6.2.4. Provide a series of workshops to identify gender, human security, resilience, and climate data gaps, as well as co-design and implement processes to capture gender-disaggregated data in all relevant sectors including exchange visits between provinces to enhance understanding of gender-responsive indicators and monitoring on progress on implementation of the indicators.

Activity 6.2.5. Development of National Indus Water Atlas web portal with GIS modelling and geotagging.

Output 6.3: Youth and women's leadership as well as Community-led adaptation solutions strengthened in climate action through awareness-raising and behavioural change campaigns.

Activity 6.3.1. Establish District Youth Forums for climate adaptation and action in Hunza, Gilgit, Swat, Nowshera, Peshawar, Sukkur, Khairpur, Sanghar and Karachi districts for developing institutional linkages and using the digital platform to disseminate public messages on climate change adaptation issues.

Activity 6.3.2. Establish local-level women's groups in Hunza, Gilgit, Swat, Nowshera, Peshawar, Sukkur, Khairpur, Sanghar and Karachi to advocate for the priorities of women with respect to water resources management and include their members in advocacy as well as in local decision making towards securing women's voices and representation in community-level structures, including but not limited to water users groups.

Activity 6.3.3. Wherever possible, support Public-Private Partnerships (PPPs) with private-sector actors in the operation, maintenance and management of WASH facilities constructed by the project.

Activity 6.3.4. Co-develop a series of knowledge products that include – one catalogue of appropriate technologies and NbS for water sector stakeholders with geographical presence and capacities for partnership in the Indus Basin, four technical papers on specific activities of the project for replication in other contexts in Pakistan and in the region, and six success stories/case studies on the project results.

Activity 6.3.5. Co-develop promotional media and social media materials for the success stories/case studies of the young women's and women's adaptation measures. This is to raise public awareness on communities' and women's unique knowledge that play pivotal roles in climate adaptation. It will also promote their participation and leadership in addressing human security stressors and social cohesion in climate adaptation including establishing partnerships with media houses and universities across the basin and with youth and women groups to mobilise collaboration for joint advocacy and media campaigns.

Activity 6.3.6. Support eco-journalism through youth-led Citizen's Reports on Climate-Resilient Watersheds in the Indus River Basin in six selected districts and linkage development with private-sector media houses.

Activity 6.3.7. Develop an advocacy campaign to replicate the project's adaptation solutions and use its knowledge products in cooperation with the PPP elsewhere in settlements around the Indus River and regionally.

Activity 6.3.8. Undertake public awareness campaigns in Hunza, Gilgit, Swat, Nowshera, Peshawar, Sukkur, Khairpur, Sanghar and Karachi districts, one in each district, focusing on adaptation practices for resilience and context-specific hazards and risks at individual, household, and community levels and harness the interrelated benefits of climate change adaptation, social cohesion, and gender equality.

A.6.1. Implementation Modality and Stakeholder Engagement

UNICEF and UN Women will be the executing agencies for this component and will implement activities through technical assistance of existing agencies' multisectoral capacities, hiring consultants, engaging academia and research institutions. The main stakeholders for this component will be the Ministry of Climate Change and Environmental Coordination (MoCC&EC), the Living Indus knowledge platform, CGPI coordination and IT platforms, MoWR and provincial Irrigation, PHED and Local Government departments. All the activities under component 6 will be implemented in coordination with other water and climate change actors at the national and target provincial level.

[27] Housed in the MoCC&EC, on which district governments report regular data from two provinces for 55 predefined indicators of five major themes of this project, i.e., water, sanitation, hygiene, liquid and solid waste management and plantation.

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Activity 6.1.2. Co-develop and advocate for improved groundwater policies and regulations in Sindh and KP to maintain sustainable groundwater extraction and resilient use patterns.
Activity 6.1.3. Facilitate the development of participatory and gender-responsive water management adaptation plans with target communities that foster constructive resilience of communities and individuals and address climate security stressors.
Activity 6.1.4. Develop and deploy capacity-building support to regulatory authorities in GB, KP and Sindh to effectively enforce groundwater regulations.
Activity 6.1.5. Facilitate application of new social technologies and gender-responsive approaches in consultation, co-developing processes, and capacity-strengthening activities, including establishing community watch groups, trainings and developing policies and strategies.
Activity 6.1.6. Advocate for establishing National Water Regulatory Authority as per findings of ongoing UNICEF study on 'legislative gap analysis in climate-resilient WASH sector.
Activity 6.1.7. Support the Government of Pakistan in improving coordination among water sector stake ... [30]
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B. Economic, Social and Environmental Benefits

The SAFER project supports the Government of Pakistan in realising its 4RF vision, particularly supporting the implementation of Strategic Recovery Objective 3 that focusses on social inclusion in building climate resilience. In 2023, UN Women consolidated locally informed evidence on gender and climate security linkages in flood-affected provinces in Gilgit-Baltistan and Sindh. These results will inform the final Gender Assessment and Action Plan of this project. The series of consultations have collected evidence on (a) the connections between women's lived experiences of climate change and human security; (b) women's practices and adaptation strategies to mitigate and respond to such insecurity; and (c) synergies between women's lived experiences and practices and government-led climate change adaptation and resilience efforts. By documenting the practices of women's participation in climate adaptation and mitigation of human security risk, the outcome will guide the planning and implementation of community-based early recovery and disaster preparedness efforts that will be useful to inform the resilience of the most exposed areas and support in building socially cohesive and climate-resilient communities that are responsive to the needs of women and youth. Under the Fund's Environmental and Social Policy (ESP) and Gender Policy (GP) of the Adaptation Fund of 2013, the importance of ensuring the inclusion of vulnerable groups in consultative and decision-making processes is highlighted.

Furthermore, as per the 15 Principles of the ESP, several apply to this project in a fundamental way, and require close cooperation with governmental counterparts, notably: Principle 1 – compliance with the law; Principle 4 – human rights: and Principle 6 – core labour rights. To this end, engagement with the MoCC&EC and local officials has been prioritised in screening the technical outputs and the selected project sites. The screening of ESP compliance has been integral to all levels of the four phases of the consultation process (Section II/H). This has resulted in conducting an environmental and social (E&S) risk assessment per component and the risks have been identified across the 15 ESP principles. These have informed the Environmental & Social Impact Assessment (ESIA). It has been ensured that community members are engaged in risk identification and decision-making, and are empowered to participate in implementation, which was crucial to design the GRM (Annex 4) and further integrating a gender-inclusive approach to project governance. The partners have organised community-level consultations (Section II/H) that are designed to provide a space for women, the youth and socially marginalised groups to guide the design of the ESIA and GRM, as well as integrate them in project governance at the local level.

The Fund's ESP and GP underline the importance of ensuring the inclusion of marginalised and vulnerable groups in consultative and decision-making processes. Furthermore, the majority of the 15 ESP principles fundamentally apply to the project, and require close cooperation with governmental counterparts, and screening of ES risks, ES assessment according to the applicable national and/or sub-national legislation, ES management planning, and monitoring of ES management compliance. ICIMOD, being an accredited regional implementing entity, has a robust environmental and social management system (ESMS) in place which will help them in planning and monitoring the project implementation through the environmentally and socially responsible executing entities (UNICEF and UN Women) in an environmentally and socially safeguarded manner. The component-specific economic, environmental and social benefits of the project have been detailed in Annex 7.

At the Concept Note stage, the project components and outputs (through activities) were screened and categorised for any environmentally and socially adverse impacts through an extensive consultative process. Subsequently, a thorough environmental and social impact assessment (ESIA) has been undertaken (Section II/K). Based on the risk categorisation and ESIA, the project's compliance to the Fund's ESP has been updated with explanations against each of the 15 principles (Section II/K).

The project's design has been meticulously crafted through a comprehensive and collaborative consultative process, engaging various stakeholders at different levels to ensure the utmost relevance and effectiveness. The following highlights the key efforts undertaken:

- Engagement with the MoCC&EC: a thorough review of the proposed community-level targeting and validation of districts or *tehsils*, along with corresponding adaptive interventions, has been conducted in close consultation with the MoCC&EC. This step ensures alignment with the planning of the six project components, maximising their applicability and impact.
- Collaborative synergies with UNCT members: The Living Indus Initiative has fostered collaboration with UNCT stakeholders, particularly those involved in projects within similar thematic or geographic contexts. Notable engagements include:
  - Cryosphere: UNDP's GLOF II
  - Springs: FAO's Nature-Based Watershed Management
  - Groundwater: UNDP's Green Infrastructure for Flood Control and Groundwater Recharge
  - Ecosystem-based Adaptation: ILO's Indus Clean-up: Industrial and Urban Effluent Treatment
  - Surface Water Conservation: WFP's 100,000 Community Pounds
- This collective effort has culminated in a refined list of intervention sites to ensure adequate existing capacity for implementation at the district level. Furthermore, the project development team has meticulously assessed risks

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across the 15 ESP principles, prioritising the application of the do-no-harm principle and the avoidance of maladaptation.

- Local Stakeholder Engagement and Validation: The proposed sites and interventions were presented to relevant local stakeholders for comprehensive discussions and validation on a component-specific basis. Key actors involved in this process included:
  - KP Planning and Development Department Component 1,2, 3.
  - KP Directorate for Soil and Water Conservation – Component -2
  - KP Disaster Management Authority (KPDMA) - Component 1,3
  - GB Disaster Management Authority (GBDMA) - Component 1
  - GB Local Government & Rural Development Department
  - Climate Energy and Water Research Institute (CEWRI) - Component 2
- Grassroots Consultations: At the local level, the project has ensured robust consultations through:
  - Key informant interviews with civil society representatives in study sites of the Sindh, KP and GB provinces.
  - Focus group discussions with community members. These consultations were held in various regions, including: (i) Kailash Valley Birir, Chitral, Khyber Pakhtunkhwa, (ii) Bagrot Valley, Gilgit-Baltistan, and (iii) Malakand and Hazara Division, Khyber Pakhtunkhwa. (iii) Project site in the Sindh Province.
  - Focus group discussion with women community members in Sindh (Sachal Goth and Thatta) and in Gilgit Baltistan (Yasin Tehsil and Bubar Village).
  - These consultations form the bedrock for compliance screening for both national legislation and Adaptation Fund's ESP. These assess the contextual appropriateness of proposed adaptation solutions, gender-related risks, and opportunities, as well as additional environmental and social risks identified in the screening process. The active involvement of community members in decision-making and implementation empowers them and shapes the design of the GRM, while promoting a gender-inclusive approach to project governance.

B.1. Economic Benefits

The project aims to bolster economic resilience in the Indus Basin by addressing critical water management challenges. Through the construction of nature-based facilities and the upgrade of water supply infrastructure, the project will ensure a more reliable water supply for agriculture, enhancing productivity and supporting livelihoods. Initiatives such as Community-Based Multi-Hazard Early Warning Systems (CB-MEWS) will mitigate financial losses from climate-induced hazards, while springs restoration and groundwater management will provide cost-effective water solutions. Additionally, implementing constructed wetlands for wastewater treatment will reduce operational costs for municipalities and create job opportunities in construction and maintenance. These efforts will ultimately contribute to broader economic growth, poverty reduction, and increased food security.

B.2. Social Benefits

The project emphasizes community involvement and inclusivity, leading to significant social benefits. By promoting the participation of women, children, and ethnic minorities in decision-making processes, the project fosters social inclusion and empowerment. Improved access to clean and reliable water supply services will enhance public health, reduce waterborne diseases, and improve the overall quality of life. Community-based monitoring systems and the establishment of water management committees will enhance safety and resilience to climate-induced shocks. Educational programs on water conservation and climate adaptation will further empower communities, enhancing their capacity to manage resources sustainably and recover quickly from disasters.

B.3. Environmental Benefits

The project promotes sustainable land use and ecosystem restoration, delivering significant environmental benefits. The implementation of CB-MEWS and cryosphere risk mapping will protect critical ecosystems from climate-induced hazards. Sustainable springshed management and groundwater recharge measures will enhance ecosystem resilience, maintain biodiversity, and reduce soil erosion. Constructed wetlands will improve water quality by naturally filtering pollutants, reducing the environmental impact of untreated wastewater, and supporting the health of the Indus River System. These efforts will contribute to the sustainable management of water resources, mitigate over-extraction effects, and foster long-term ecological balance and climate resilience in the region.

B.4. Vulnerability and Beneficiaries Analysis

Figure 10 shows, multiple natural disasters were recorded in Pakistan, including floods which hit almost every year.[28] The most vulnerable populations to floods are living in the Indus River Basin. Map 6 illustrates major areas where populations

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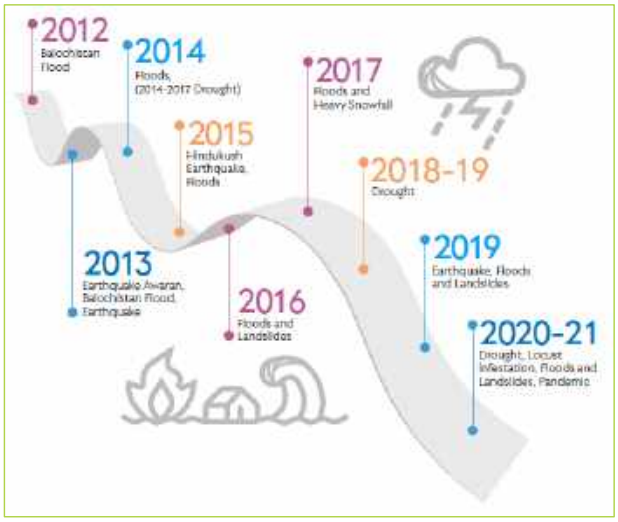
[28] Government of Pakistan. 2021. *Climate Risk Assessment for WASH Sector in Pakistan*. Islamabad: Ministry of Climate Change.

are vulnerable to seasonal floods mostly in KP, Punjab and Sindh Provinces, and drought.[29] Targeted districts are part of these flood- and drought-prone areas, where the population is vulnerable to climate-induced disaster risks which pose socioeconomic, financial, and environmental impacts. The summaries of province-specific climate hazards and underlying vulnerabilities in the target areas are given in Annex 8.

B.4.1. Gilgit-Baltistan Province

A comprehensive vulnerability assessment focused on cryosphere hazards, particularly GLOFs, in northern Pakistan, encompassing the GB region, was conducted based on specific selection criteria. The assessment prioritises areas with the existence of potentially dangerous glacier lakes, as identified in the GLOFs database, emphasising lakes measuring over 200 km^2 and a history of past damages. The Upper Indus Basin (UIB) in the HKH region, characterised by a high frequency of GLOF events, serves as a key indicator. Physical accessibility, the presence of downstream vulnerable communities and critical infrastructure, and the existence of permafrost further contribute to the assessment. The potential risk of debris flow, triggered by GLOFs and other hazards in permafrost-rich areas, is also considered. This vulnerability assessment aims to inform targeted interventions, adaptation, and mitigation measures, recognising the socioeconomic, financial, and environmental impacts of cryosphere-related disasters in the region. Map 1 shows the most vulnerable areas based on the vulnerability assessment.

Figure 10: Natural Disasters in Pakistan



Source: Government of Pakistan. 2021. *Climate Risk Assessment for WASH Sector in Pakistan*.

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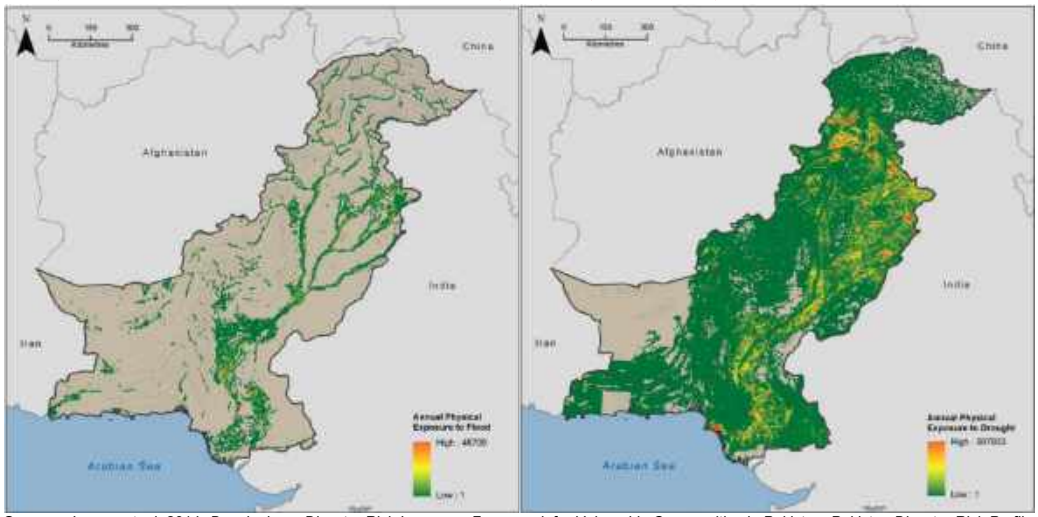
[29] Larsen et. al. 2014. *Developing a Disaster Risk Insurance Framework for Vulnerable Communities in Pakistan: Pakistan Disaster Risk Profile. Report No. 16*. Bonn: UN University Institute for Environment and Human Security (UNU-EHS).

Map 6: Expected Average Annual Population Exposed to Floods and Droughts



Source: Larsen et. al. 2014. *Developing a Disaster Risk Insurance Framework for Vulnerable Communities in Pakistan: Pakistan Disaster Risk Profile. Report No. 16.*

In Gilgit-Baltistan province, specific valleys such as Ishkoman, Manjawa, Sher Qilla, Hassan Abdal, Shimshal and Bagrot, stand out as particularly prone to cryosphere hazards, including GLOFs. The assessment expresses a high level of confidence in the intensity, frequency, duration, and geographical extent of these hazards in Gilgit-Baltistan. These valleys within GB are identified as areas where populations are vulnerable to GLOFs and related cryosphere hazards, emphasising the urgent need for strategic planning and adaptive measures. This recognition underscores the significance of addressing the socioeconomic and environmental impacts associated with cryosphere-related risks in these provinces, with a specific focus on the mentioned valleys. The details of beneficiaries are shown in Table 2 and the summary of climate hazards and underlying vulnerabilities in the target areas in Annex 8. Gilgit and Hunza are relatively heterogeneous populations with Imamia Shia Asna Ashriya as the majority with a total population roughly constituting 54% of the total population of the two districts. Gilgit and Hunza incorporate three major identities – Brusho, Sheen, and Yashkun. They speak Shina, Brushaski, and Wakhi languages. The project will carefully target different community groups to address specific vulnerabilities in the targeted districts.

Table 2: Beneficiaries in Gilgit-Baltistan

Province	District	Valley	Population
Gilgit-Baltistan	Gilgit	Ishkoman, Manjawa, Sher Qilla	40,000
Gilgit-Baltistan	Gilgit	Bagrot	10,000
Gilgit-Baltistan	Hunza	Hassan Abdal	1500
Gilgit-Baltistan	Hunza	Shimshal	2,000

B.4.2. KP Province

According to the findings from the climate risk assessment (MoCC, 2021),[30] the prominent hazards identified in KP Province are drought and floods with high confidence in terms of intensity, frequency, duration, and geographical extent. Many populations in targeted 7 districts in KP are vulnerable to drought as well as seasonal floods including GLOF (). According to UNHCR 2020 database, in the project targeted 7 districts of KP there are over 201,000 vulnerable Afghan refugees spread across different locations. The project will directly target villages with high number of refugees and directly benefit over 20,000 Afghan refugees through provision of climate resilient water supply systems and groundwater recharge

[30] Government of Pakistan. 2021. *Climate Risk Assessment for WASH Sector in Pakistan*. Islamabad: Ministry of Climate Change.

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facilities. Additionally, refugee communities will also be represented in water management committees and other community structures that will be established and strengthened by the project.

Table 3: Beneficiaries in KP

Name of District	Swat	Charsadda	Nowshera	Lower Dir	Chitral (Lower & Upper)	Mansehra	Abbottabad
Number of Tehsils	5	2	1		2		
Number of Union Council	11	6	9		4		
Total beneficiaries	85,000	26,895	27,500	31,033	17,000	21,244	24,050
# of females	41,765	13,179	13,475	14,000	8,000	9,000	11,000
# of children (<18 years old)	40,203	12,533	12,815	12,000	7,000	8,000	9,600
# of people with disabilities	910	565	578	550	400	610	500
# of households	6,193	3,842	3,928		2,100		
How many people will benefit from the following interventions in the community							
Groundwater recharge facilities	30,000						
Solar pump	8,075	23,695	24,100				
Wetland	5,279	3,200					
Springs revival	58,672			31,033		21,244	24,050
Cryosphere early warning system					17,000		
Early warning systems in place covering different types of hazards	The National Disaster Management Agency (NDMA) has identified needs to develop early warning system but currently there is no established system that works at community level.						
Existence of drainage/sewage system	Sewage system does not exist even in urban towns and 99% of wastewater is discharged untreated in open drains. Drainages are partially available in urban areas, but very limited in rural areas.						
Existence of different groups (ethnic minority, etc) who are treated differently	There are several Refugee Villages (RVs) for Afghan refugees in KP Province that are under the mandate of Commissionerate of Afghanistan Refugees (CAR), different from the general service delivery in both urban and rural areas. In the target areas, there are Afghan refugees in the communities who are marginalised from the main population.						
Participation of women in decision-making process	Women are members of WASH committees in most rural areas and involved with decision-making process at community level.						
Main livelihoods / sources of income in communities	Mostly agriculture and informal sector labourer, such as service and construction work.						

B.4.3. Sindh Province

According to the findings from the climate risk assessment (MoCC 2021), the prominent hazards identified for Sindh Province are drought and floods with low confidence for droughts and medium confidence for floods in terms of intensity, frequency, duration, and geographical extent. Though probability of drought is not so high, water quality in Sindh is extremely poor due to hydrogeological conditions, which has been exacerbated by erratic rainfall patterns. According to the 2017 census, over 2.5 million religious minorities (Hindus, Christians, Qadiani and others) live in the project target 7 districts in Sindh which constitute about 23% of the total population in the target districts. The project will give special attention to target these minority groups through provision of water supply services, construction of wetlands and other project components and active participation of the minorities in the management committees and livelihood opportunities that will be created by the project. The community consultations also conducted in these minority groups and their specific needs, vulnerabilities and challenges identified will be used during the implementation of the project.

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Table 4: Beneficiaries in Sindh

Name of District	Khairpur	Mirpur Khas	Sanghar	Sujawal	Sukkur	Tharparkar	Umerkot
Number of Tehsils	3	5	2	2	2	5	3
Number of Union Council	10	14	3	6	2	13	14
Total beneficiaries	27,251	32,916	5,260	8,006	15,329	21,144	39,845
# of females	13,353	16,128	2,577	3,923	7,511	10,361	19,524
# of children (<18 years old)	12,699	15,338	2,451	3,730	7,143	9,853	18,568
# of people with disabilities	299	362	57	88	168	232	438
# of households	3,893	4,702	751	1,143	2,189	3,143	5,692
How many people will benefit from the following interventions in the community							
Solar pump	6,489	23,881		6,296	10,751	352	24,881
Lead line handpump	11,212	9,035		1,710	3,607	252	10,764
Wetland	9,550				971		
Water pond			1,600			20,540	1,700
Dhoras			3,660				2,500
Early warning systems in place covering different types of hazards	NDMA has identified needs to develop early warning system but currently there is no established system that works at community level						
Existence of drainage/sewage system	Drainage system is very limited in most rural areas, while sewage system is non-existent as 99% of wastewater is discharged untreated in open drains						
Existence of different groups (ethnic minority, etc) who are treated differently	Diverse non-Muslim group in especially Umerkot, Tharparkar, Mirpukhas where socioeconomic conditions is quite vulnerable as those community members are casual labourers. They are significantly vulnerable to natural calamities, such as floods and droughts as they habit in lowlands which significantly be affected. Sujawal is located at coastal side and dominantly fishery Muslim community where significantly affected by floods. Sukkur used to be a host community when floods hit, accommodating diverse affected population (internally displaced people). In Khairpur, the majority of the population are agricultural labourers who are socioeconomically vulnerable. Sanghar has a mixed diverse group of Muslim and non-Muslim communities who are more vulnerable.						
Participation of women in decision-making process	Women are members of WASH committees in most rural areas and involved with decision-making process at community level						
Main livelihoods / sources of income in communities	Mostly agriculture, fishery, and informal sector labourer, such as service and construction work. According to the community members and women interviewed, child labour has also increased as a result of families' income and livelihoods being diminished due to climate impact including floods and low productivity of agriculture.						

C. Cost Effectiveness Analysis

Even without accounting for climate change, the economic cost to Pakistan of the present state of water resource management is estimated to be US$12 billion per annum (4% of GDP). Degradation of the Indus Delta costs Pakistan another US$2 billion. Both numbers may be underestimated given the unavailability of robust ecological and social costs. Projected scenarios from the IPCC and ICIMOD[31] underline the need for an adaptive approach to the management of water resources of the Indus in Pakistan.

When considering the cost-effectiveness of the proposed project, it is crucial to take the potential cost of inaction as a baseline cost to be mitigated. Working with the basic assumption that the Indus meets at least a simple majority of Pakistan's water needs amounts to US$6 billion per annum, plus the US$2 billion in lost revenue due to the degradation of its delta, yields a per-annum estimated cost of Indus degradation of US$8 billion. The proposed project will not be able to mitigate this total loss; however, it will lay the foundation for gradual comprehensive mitigation.

[31] ICIMOD. 2023. Water, ice, society, and ecosystems in the Hindu Kush Himalaya: An outlook.

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The SAFER project has a definitive advantage in that ICIMOD, UNICEF and UN Women have long-standing working relationships with the Government of Pakistan. In addition, they will not require any additional office infrastructure and minimal additional staff. This will allow a larger share of the budget to go to the implementation of the projects at community level and strengthening the institutional and human resource capacity of the government at all levels. This means that the actual costs to the Adaptation Fund will be comparatively low, as no new structures will be created.

The project will emphasise investment in green and resilient hard infrastructure which is low cost, and community based. Each vertical component will spend between 65 and 50% of its budget on deploying these solutions. Where the project invests in soft measures, these will produce one of three benefits leading to cost-effective adaptive outcomes:

- Supporting the technical capacities of the Government and the communities to construct, replicate and maintain the constructed had.
- Strengthening tehsil/district/division/province-level planning capacity to sustain and scale up the benefits of the project and increase the efficacy of national budgeting considering climate-induced shocks.
- Supporting the implementation of the NAP and building the overall knowledge base available to the partners of the Living Indus Initiative, and the sector more generally.
- Strengthening the social capacities of the Government and communities to continue exploring and implement adaptive mitigation and climate adaption practices that are inclusive, participatory and sustainable.

This approach will ensure that the adaptation benefits per dollar invested are leveraged, while producing concrete impact per beneficiary in the communities of intervention, empowering policymakers through increased knowledge and inter-linkages with the relevant private-sector actors. These results will be further bolstered at the sectoral development level through Component 6 that fosters the adaptive capacities, enhances community mobilisation and awareness raising as well as fosters knowledge exchange and use for sustainable climate adaptation practices nationally and regionally.

In addition to the above qualitative analysis of the cost effectiveness of the project, a comparison of the return on investment of the proposed solutions against the alternative solutions has been conducted for all the project activities involving construction by developing an investment case model for 10-years lifetime of the project, incorporating capital investment, operation and maintenance costs which factor in inflation across the project's 10-year lifetime. Below are the key assumptions and cost effectiveness analysis summary of the proposed solutions using the investment case model:

- Household size used for proposal and calculations – 7 people per HH.
- The average annual inflation rate for cost adjustment is estimated at 10%
- One groundwater recharge facility proposed by the project will be servicing an average of 1300 people with sustained water supply. To serve the same number of people with the alternative solution HH rainwater harvesting facility, we would need 186 HH rainwater harvesting facilities.
- Total target population for one solar water point and the alternative motorised or agri-connected water point is 1,500 people.
- The total population one lead line handpump will be serving is 250 people per handpump. This means to serve the same number of people for a solar water point, the project would need to construct 6 hand pumps.
- The total population targeted by one wetland is 2800 people and the alternative conventional treatment system cost is also estimated for the same number of people.
- The total population targeted by one community pond is 2000 people and the alternative RO-fitted water point, the cost is also estimated for the same number of people.
- Operation and maintenance costs are estimated based on existing field experience of costs and increased by 10% each year to adjust for inflation.
- The rate of investment calculations for 10 years done with future value of the investment adjusted for inflation.

Output 3.1 Alternative Solutions	Year 1 (US$)	Year 10 (US$)
Groundwater recharge		
Capital costs inflation adjusted	50,000	117,898
Total O&M costs inflation adjusted	3000	278,587
Total Value with inflation	53,000	375,810
Real future value without inflation	53,000	197,898
Household Rainwater Harvesting		
Capital costs – 186 units	168,687	397,756
Total 10 years O&M costs inflation adjusted	6,696	937,888
Total Value HH rainwater harvesting	175,383	1,211,977
Real future value without inflation	175,383	632,845

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In the ten-year lifetime of the project, the proposed solution of nature-based groundwater recharge facilities will have a saving of US$434,947 in future value, compared to alternative solutions. This makes it a very cost-effective solution compared to the alternative solution.

Output 3.2 Alternative Solutions	Year 1 (US$)	Year 10 (US$)
Lead line handpump		
Capital costs	10,774	25,405
Monthly subtotal inflation adjusted	*5400*	*60,964*
Total Value Lead line Hand pump	16,174	156,739
Real future value without inflation	*16,174*	*90,179*
Solar Water Points		
Capital costs	16,149	38,079
Total O&M costs inflation adjusted	3,600	90,495
Total value Solar powered Water point	19,749	163,311
Real future value without inflation	19,749	90,228
Generator powered/grid Connected Water point		
Capital costs	14,139	33,338
Monthly subtotal inflation adjusted	*8,400*	*78,609*
Total Value generator/Grid connected Water point	22,539	224,971
Real future value without inflation	*22,539*	*130,776*

In the ten-year lifetime of the project, the proposed solutions of solar-powered water points and lead line handpumps will have a saving of over US$40,500 in future value compared to alternative solutions of a generator or grid-connected water points. In addition, further analysis of the lead line handpumps and solar water points indicated that for a lower number of beneficiaries, hand pumps are more cost-effective solutions than solar pumps. Therefore, the project proposed solar and lead line handpumps depending on the target populations in the target locations.

Output 4.2 Alternative Solutions	Year 1 (US$)	Year 10 (US$)
Wetlands		
Capital costs	74,320	175,243
Total O&M costs inflation adjusted	3,000	413,804
Total 15 wetlands Cost	77,320	535,348
Real future value without inflation	77,320	279,564
Conventional Wastewater Treatment systems		
Capital costs	119,642	282,108
Total O&M costs inflation adjusted	3,200	665,197
Conventional wastewater treatment plants	122,842	835,209
Real future value without inflation	122,842	433,483

In the ten-year lifetime of the project the proposed solutions of Solar powered water points and lead line Hand pumps will have a saving of about US$154,00 in future value compared to alternative solutions of Conventional Wastewater treatment plant.

Output 5.2 Alternative Solutions	Year 1 (US$)	Year 10 (US$)
Community Ponds		
Capital costs	54,776	129,158
Total O&M costs inflation adjusted	2,400	305,020
Total Community Ponds	57,176	397,574
Real future value without inflation	57,176	207,934

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Output 5.2 Alternative Solutions	Year 1 (US$)	Year 10 (US$)
Water systems with Reverse Osmosis treatment		
Capital costs	0	127,098
Total O&M costs inflation adjusted	350	299,691
Total RO based Water systems	58,102	419,705
Real future value without inflation	58,102	222,650

In the ten-year lifetime of the project, the proposed solutions of community ponds will have a total saving of about US$15,000 in future value compared to alternative solutions of water points with reverse osmosis treatment facilities. These monitoring benefits are additional benefits of environment, ease of management and other quantitative benefits described above.

All methods drawn on in this project have been designed, tested, and benchmarked against alternatives to ensure not only cost efficiency but also contextual appropriateness. Table 5 demonstrates the cost-effectiveness logic of the selection of investments to be implemented under the project within the Pakistani context. This shows that the benefits provided, especially in terms of improved safety and resilience, were a key consideration in the selection of investments to be carried forward to the proposal. The component-specific benefits of the project are detailed in Annex 9.

Table 5: Cost and Alternatives Analysis of Proposed Adaptation Options

Cost Effectiveness Criteria	Proposed Action	Ranking	Alternative Action	Ranking
Future Cost of Climate Change	Cryosphere CB-MEWS – non-structural measures	L	Structural measures (e.g., gabion walls, check dams etc.)	H
Project Efficiency		H		M
Community Involvement		H		M
Cost		L		H
Environmental and social safeguarding risks		L		H
Future Cost of Climate Change	Springs Revived	L	Surface water diversion and treatment	H
Project Efficiency		H		M
Community Involvement		H		M
Cost		L		H
Environmental and social safeguarding risks		L		H
Future Cost of Climate Change	Groundwater recharge, combined with solar and hand pumps	L	Rainwater harvesting with conventional motorised water supply systems	M
Project Efficiency		H		M
Community Involvement		H		H
Cost		L		M
Environmental and social safeguarding risks		L		M
Future Cost of Climate Change	Constructed Wetlands	L	Conventional wastewater treatment facilities	M
Project Efficiency		H		M
Community Involvement		H		L
Cost		L		H
Environmental and social safeguarding risks		L		M
Future Cost of Climate Change	Community Ponds and rehabilitated waterways	L	Reverse Osmosis based water treatment systems	L
Project Efficiency		H		H
Community Involvement		H		L
Cost		L		H
Environmental and social safeguarding risks		L		M

Notes: H = high, M = medium, L = low, N = none

D. Alignment with National or Sub-national Policies and Sustainable Development Strategies

The proposed project aligns with Pakistan's national vision, policies, action plans, water and sanitation strategies and commitments in several ways:

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- **Pakistan Vision 2025** – is a commitment by the Government of Pakistan for ensuring that Pakistan succeeds in achieving the proposed Sustainable Development Goals (SDGs) of zero poverty and hunger, universal access to health services, education, modern energy services, clean water, and sanitation, and join the league of Upper Middle-Income countries by 2025. The vision has 7 pillars 1) Developing social and human capital and empowering women, 2) Sustained, indigenous, and inclusive growth, 3) Democratic, governance: institutional reform and modernization of the public sector, 4) Energy, water, and food security, 5) Private Sector and entrepreneurship-led growth, 6) Developing a competitive knowledge economy through value addition and 7) Modernising transport, infrastructure, and regional connectivity. The SAFER project directly aligns with Pillar 4 on energy, water and food security and substantially contributes to other pillars including developing human capital and empowering women, institutional reform, sustained and indigenous inclusive growth.
- **National Water Policy of Pakistan (2018) –** the national water policy lays down a broad policy framework and set of principles for water security on the basis of which the provincial governments can formulate their respective master plans and project for water conservation, water development and water management. The national water policy is based on the concept of integrated water resource management and aimed at 33 policy objectives. The SAFER project aligns with most of the 33 policy objectives including on promoting sustainable consumption and production patterns, augmentation of available water resources, improving quality, promoting behavioural change to reduce wastage, improving water shade management, restoring health of the environment, flood and drought mitigation, promoting appropriate technologies, regulating groundwater withdrawals, strengthening capacity of water sector and others.
- **National Sanitation Policy of Pakistan –** National Sanitation Policy of Pakistan provides a broad framework and policy guidelines to the Federal Government, Provincial Governments, Federally Administrated Territories and the Local Governments, to enhance and support sanitation coverage in the country through formulation of their sanitation strategies, plans and programmes at all respective levels for improving the quality of life of the people of Pakistan and the physical environment necessary for healthy life. The primary focus of sanitation for the purpose of this policy is on the safe disposal of excreta away from the dwelling units and workplaces by using a sanitary latrine and includes creation of an open defecation free environment along with the safe disposal of liquid and solid wastes; and the promotion of health and hygiene practices in the country. Component 4 of the SAFER project directly aligns with the first objective of the policy which is safe disposal of liquid, solid, municipal, industrial, and agricultural wastes and the promotion of health and hygiene practices.
- **National Environmental Policy (2005)** – the national environment policy provides and overarching framework for addressing the environmental issues facing Pakistan, particularly pollution of freshwater bodies and coastal waters, air pollution, lack of proper waste management, deforestation, loss of biodiversity, desertification, natural disasters and climate change. It also gives directions for addressing the cross sectoral issues as well as the underlying causes of environmental degradation and meeting international obligations. The policy has five policy objectives and nine sectoral guidelines. The SAFER project aligns with objective one of the policy which is conservation, restoration and efficient management of environmental resources and also in line with water supply and management sectorial guidelines which includes developing legal and policy framework for promotion of safe drinking water, increase coverage of water supply and water treatment facilities, promote appropriate technology for rain water harvesting and encourage artificial recharge of groundwater in arid and semi-arid areas.
- **National Adaptation Plan of Pakistan (2023):** Under the climate impacts, the NAP specifically lists: (i) flooding and water scarcity in GB and KP due to glacial retreat, of which SAFER project Components 1 and 2 explicitly address (ii) groundwater overuse, and Components 3 and 5 address (iii). Component 4 explicitly supports the government's stated adaptive priority of building urban resilience considering an increasingly urban population.
- The SAFER project fully aligns with the following objectives identified by NAP 2023:
    - Promoting integrated watershed management (Natural Capital).
    - Improving water quality through better wastewater management (Natural Capital).
    - Improving land regulation and land-use planning to bolster resilient service provision (Urban Resilience).
    - Leveraging nature-based solutions to manage climate risks (Urban Resilience).
    - Enhancing climate resilience through disaster emergency preparedness and response (Human Capital).
    - Understanding climate and disaster risk by investing in state-of-the-art early warning systems, gathering, and utilising data-driven insights to analyse climate patterns and potential disasters (Disaster Risk Management).
    - Strengthening disaster risk governance by establishing clear policies, institutional frameworks, and coordination mechanisms (Disaster Risk Management).
    - Investing in disaster risk reduction to bolster the resilience of communities and critical infrastructure (Disaster Risk Management).
    - Promoting inclusive participation of vulnerable groups in climate-related policy and development planning (Gender, Youth, and Social Inclusion).
- The project is also in line with the initiatives identified under the **Living Indus Initiative** (2022), specifically 'A Living Indus Knowledge Platform: Crowdsourcing Knowledge'; 100,000 Community Ponds; Green Infrastructure

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for Flood Control and Groundwater Recharge; Sustainable Groundwater Governance through Provincial Water Acts; Nature-Based Watershed Management; and Indus Clean-up: Industrial and Urban Effluent Treatment.

- **National Water Conservation Strategy for Pakistan 2023.** The strategy has four main dimensions focusing on three major sectors (Agriculture, Domestic and Industrial). Related to these, the key target dimensions include improved water productivity and efficiency; effective public-private partnership and enhanced public awareness. The project directly aligns with the strategic objectives related to the domestic and commercial sectors, specifically on objectives on regulating groundwater abstraction for residential and commercial sectors; Introduce and promote water-saving technologies and mass awareness programmes for water conservation to reduce wastewater generation.
- The SAFER project will also contribute to targets set by Pakistan under SDGs, especially those related to Clean Water and Sanitation (SDG-6) and Climate Change (SDG-13).
- **Reduced climate hazard exposure:** The project focuses on enhancing warning systems, resilient land use planning, and water access, lowering climate-related community risks. This aligns with the 2021 Pakistan National Climate Change Policy's (PNCCP) goal of bolstering remote sensing and GIS for glacier and snow monitoring. Remote sensing supports planning, while community-based solutions (e.g., CB-MEWS) minimise sudden disaster impacts. Remote sensing data aids climate-resilient land planning, echoing the 2022 Living Indus Initiative and local CB-MEWS expansion under the GCF-funded GLOF II project.
- **Strengthened institutional capacity:** The project aims to enhance community and institutional capacity to anticipate and respond to climate hazards, restore and manage springs, mitigate groundwater depletion, and implement ecosystem-based solutions. This aligns with Pakistan's commitment to strengthening institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses. The Government of Pakistan launched Clean Green Pakistan Movement (CGPM) in November 2019, and the Clean Green Pakistan Index (CGPI) is its core pillar. This city/tehsil and neighbourhood-level index aims to rank them according to their cleanliness and greenery. The CGPI performance indicators include safe drinking water, solid waste management, liquid waste management/hygiene, plantation, and total sanitation. The project seeks to contribute to this commitment at the community and institutional levels.
- **Strengthened awareness and ownership at the local level:** By enhancing awareness and ownership of adaptation and climate risk reduction processes locally, the project aligns with Pakistan's goal of strengthening awareness and ownership of climate-related processes among communities. The project will directly support two policy measures outlined in the PNCCP, notably: (1) Develop a national climate change awareness programme involving communities, as well as climate change relevant ministries and departments; and (2) Ensure advocacy and awareness regarding the importance of water and energy conservation and the impact of climate change on various sectors (e.g., forest ecosystems, biodiversity), using mass media, PPPs, students and community mobilisation; and incorporate these issues into the formal education systems at all levels.
- **Increased ecosystem resilience:** The project focuses on increasing resilience to climate change and variability-induced stress, mainly by restoring and managing springs and implementing ecosystem-based solutions. In 2019, the Pakistan government launched its innovative 'Ecosystem Restoration Initiative to facilitate the transition towards environmental resilience by mainstreaming adaptation and mitigation through ecologically targeted initiatives.
- **Support for KM and scaling up:** The project emphasises awareness creation, KM, and documentation of adaptation solutions and strategies. This aligns with Pakistan's commitment to support the development and diffusion of innovative adaptation practices, tools, and technologies and to expand the uptake of successful approaches beyond the project. This closely aligns with the aims of the 2022 Living Indus Initiative, which UNICEF was involved in developing, and which envisages a living menu of 25 preliminary interventions. Among them: A Living Indus Knowledge Platform: Crowdsourcing knowledge; the project will aim to use its cross-cutting component as a first step towards this item, ensuring the knowledge generated is scaled up and carried forward by all Living Indus partners.
- **Support integration of women and youth in climate mitigation and adaptation initiatives:** ccGAP aims were adopted in 2022 to integrate gender and climate fully in key sectors of the economy, particularly agriculture and food security, water and sanitation, disaster risk management, forests and biodiversity, coastal management, energy, and transportation. The ccGAP is a tool to enhance knowledge and capacities, identify gaps and enabling conditions, and build coordination and actions to strengthen gender-responsive strategies and results to meet the country's climate change objectives. Moreover, the project will leverage synergistic opportunities between National Gender Data Portal and Living Indus Knowledge Platform.
- **Strengthened recovery, rehabilitation, and reconstruction of the impacts of climate disasters:** In response to the 2022 floods, the Resilient Recovery, Rehabilitation, and Reconstruction Framework (4RF) is the Government of Pakistan's strategic policy and prioritisation document, which is guiding the recovery, rehabilitation, and reconstruction of the country. It provides programmatic priorities, policy framework, institutional arrangements, financing strategy, and implementation arrangements. The 4RF takes a long-term perspective to climate resilience while also addressing the immediate reconstruction needs. The Strategic Recovery Objective 3

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of the framework emphasises that Pakistan's high exposure to multiple natural hazards and accelerated climate change, should be seen in the context of its social vulnerability. It acknowledges that in the wake of the 2022 disastrous floods, the need for social protection measures and emergency support services for vulnerable groups has magnified and the vulnerable sections of the population have encountered specific difficulties stem from loss of documentation, harmful/inequitable social norms, negative coping strategies, inadequate infra- structure, and weak assistance capacity to deal with specific needs.

Table 6: Complementarity with Pakistan's 2021 Updated NDCs

NDCs – Priority Area	Corresponding Project Component / Output
Strengthening the capacity to coordinate and promote climate change adaptation (CCA) at systemic, institutional, and individual levels and help poor and climate vulnerable communities to adapt to climate change impact.	Supported in a cross-cutting manner through all components
Integrating CCA into policies, strategies, legislation, regulations, and programmes	Supported in a cross-cutting manner through all components
Strengthening of a system to generate and share knowledge, experience, and lessons learned at national and sub-national levels to advance CCA.	Adaptive Capacities and Empowered Communities for Strengthened Resilience to Climate Change
Development of a strategy to implement, monitor, and communicate adaptation benefits at different levels, scale up government efforts in adaptation efforts, and process of regularly updating NAP.	Adaptive Capacities and Empowered Communities for Strengthened Resilience to Climate Change

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E. Compliance with National Technical Standards and the Adaptation Fund ESP

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E.1. Environmental Compliance and Regulation Adherence

Developing community ponds and constructed wetlands for wastewater treatment meticulously aligns with Pakistan's relevant legal provisions. Adherence to environmental regulations governing water quality and pollution control is a superior priority. The SAFER project strictly adheres to the guidelines set forth by the federal and sub-national environmental protection agencies (EPAs) and other pertinent authorities governing the construction and operation of wastewater treatment facilities. The design and execution of community ponds and constructed wetlands incorporate a comprehensive understanding of the prevailing laws and regulations about water resource management and conservation. Furthermore, the project's implementation ensures full compliance with all requisite permits and licences, which is crucial for construction. By upholding the applicable legal provisions in Pakistan, the construction of community ponds and constructed wetlands will significantly contribute to sustainable wastewater management, pollution mitigation, and overall environmental enhancement in strict accordance with the country's legal framework.

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E.2. Adherence to Specific ESP Principles and Regulations

Throughout the project's distinct components, meticulous attention has been paid to align with both national technical standards and the guiding principles of the Adaptation Fund's ESP.

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Component 1 complies with the ESP principles and Gender Policy of the Adaptation Fund in the following ways:

- It has been designed after a screening of potential environmental and social impacts in accordance with the Fund's 15 ESP principles. Particular attention has been paid to Principles 2, 3 and 5 through the application of learning from ICIMOD's work on applying the Sendai Framework.[32]
- Special attention has been given to principles 7 and 14, concerning the Kailash Valley and its Indigenous population, drawing lessons learnt from a previous World Bank Project in that area. The World Bank has developed an Indigenous Peoples Planning Framework to address the project's potential impacts on the Kailash people.

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Specific Pakistani policies and legislation that are relevant to and have been considered in the design of component 1, in line with Principle 1 of the Fund, include:

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- National Water Policy 2018, for building community-based capacity to mitigate floods and minimise their damages.
- National Water Conservation Strategy for Pakistan 2023-27

[32] ICIMOD. (2022). State of gender equality in South Asia and the Hindu Kush Himalayas. ICIMOD Library. Link

- Disaster Management Act, 2010: provides the institutional and functional guidelines for all DRR-related interventions.
- National Environmental Policy 2005
- National Climate Change Policy 2021

Component 2

- Output 1 conforms to Pakistan EPA (PEPA) guidance on water resources management, with data collection informing springshed management plans.
- Output 2 adheres to PEPA guidance on groundwater recharge, enhancing access to clean drinking water through improved springshed measures.
- Output 3 strengthens water governance, regulatory frameworks, and institutional capacity for springshed management.

Component 3, 4 and 5

This component will be designed and implemented in line with the following environmental and technical regulations and standards at Federal and Provincial level:

National Environmental Policy (NEP) of Pakistan – this policy and guidelines will be followed across all three components as follows:

- Output 3.1 – The nature-based groundwater recharge facilities in KP will be designed and constructed in line with the NEP sectoral guidelines of water supply and management specifically in line with the guidance on artificial aquifer recharge in arid and semi-arid areas.
- Output 3.2 – Climate-resilient water points will follow the NEP policy sectoral guidelines for water supply and management specifically increasing coverage of water supply and water treatment facilities and water quality monitoring and surveillance.
- Output 4.2 – Construction of wetlands – This will use the NEP sectoral guidelines for waste management specifically guidelines on treatment of municipal and industrial waste in urban and rural areas.
- Output 5.2 – Construction/rehabilitation of Doras and ponds will follow the NEP water supply and Management sector guidelines specifically technical guidelines for watershed management.

Pakistan Environmental Protection Agency (EPA) – Environmental Guidelines – Components 3, 4 and 5 will be using the Pakistan EPA environmental guidelines as follows.

- Output 3.1 – Nature-based groundwater recharge facilities will be using EPA guidelines and checklist for water reservoirs in arid zones and EPA guidelines for designs for ditches and trenches and groundwater recharge guidelines.
- Output 3.2 – Climate resilient solar and handpump water points will use EPA checklist for Small to Medium-Sized Water Supply Schemes and EPA water quality standards.
- Output 4.2 – Construction of Wetlands will be constructed in line with EPA national environmental quality standards for municipal and liquid industrial effluents and EPA environmental guidelines for sanitation schemes.
- Output 5.2 – Construction/rehabilitation of Doras and ponds will follow EPA Environmental Assessment Checklists and Guidelines for Construction and Lining of Watercourses, construction of Water Reservoirs in Arid Zones and canal cleaning.

Public Health Engineering Departments (PHED) Design Criteria for Water Supply and Sanitation Infrastructure – These standards were initially developed by PHED in Punjab and adopted by all the other provinces. The technical design criteria will be applied for following outputs under component 3, 4 and 5:

- Output 3.1 – The nature-based groundwater recharge facilities in KP will be designed and constructed in line with the PHED material standards, well construction standards.
- Output 3.2 – Climate-resilient water points will follow the PHED design criteria for water wells, material standards pipeline works, water quality and other relevant design and construction standards.
- Output 4.2 – Construction of wetlands – will follow PHED standards for Manholes and Sewer Appurtenances and sewer manhole and pipe standards.
- Output 5.2 – Construction/rehabilitation of Doras and ponds will follow the PHED standards for filtration systems and water collection networks.

Sindh Environmental Protection Agency Regulation, 2021 – the activities planned in Sindh under components 3, 4 and 5 are all under schedule II of the Sindh environmental agency regulation which need only environmental checklist and Initial environmental examination. The project will prepare environmental checklist and Initial Environmental Examination as per the regulation for the activities planned in Sindh under this component.

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Government of Khyber Pakhtunkhwa Finance Department Construction Standards – All the construction works under component 3 and 4 planned in KP will follow the construction standards which included Material Standards for construction, Technical Specifications for Workmanship, Market Rate Analysis (Annual cost Benchmarking for construction services).

Khyber Pakhtunkhwa Integrated Water Resource Management Board Ordinance, 2022 – The project activities under component 3, output 3.1 groundwater recharge facilities and Output 3.2 solar powered water points will follow the board guidance for acquiring and updating information on local water use and quality patterns for reporting for the board.

When the project implementation started, this comprehensive approach will be further augmented with other relevant and specific local level regulations and guidelines to meet the required environmental and technical standards.

F. Complementarity to Other Funding Sources

Great effort has been undertaken to ensure that the proposed project will not duplicate any activities currently funded or foreseen by the Government of Pakistan or otherwise known to the partners. Specifically, by rooting the project in the wider context of the Living Indus Initiative, the project is positioned in a collaborative multi-agency intersectoral development response to the challenges facing the population in Pakistan's Indus Basin. The project concept design team has worked to ensure that the proposed SAFER project is complementary to governmental initiatives (as noted in previous sections) and to strengthen the outcomes of complementary projects. Consultations are ongoing to ensure that all relevant projects are contacted, and that geographic targeting and thematic intervention logic are closely coordinated.

The project outputs, interventions and geographic targets are designed in consultation with all above project targets and activities, consultation with relevant provincial department of Public Health Engineering, Local Government and Irrigation Departments in Sindh, KP and GB to ensure the project is not overlapping with other government, multilateral, bilateral and NGO ongoing and planned projects and ensure complementarity of this project to other similar projects. The project is also shared with partners through existing national and provincial water sector and climate coordination platforms and inputs received from all the main actors in the sector to ensure no overlapping interventions, integrating the project activities to existing coordination platforms and enhance complementarity. The project's complementarity to the contemporary initiatives is summarised in Table 7 and detailed in Annex 10.

Table 7: Contemporary Initiatives

Project Title	Dates	Complementarities
Clean Green Pakistan	2018 to indefinite date	Supports community knowledge and practices on cleanliness and climate change. No overlap; project focuses on institutional and community mobilization rather than specific interventions.
Living Indus	2022 to indefinite date	Contributes to 10 of 25 preliminary menu interventions for the Indus. Designed to complement ongoing efforts without overlap, providing critical interventions for the Indus.
The Resilient Recovery, Rehabilitation, and Reconstruction Framework Pakistan (4RF)	2022–2029 (approx.)	Informs government selection of priority pilot communities with vulnerability information. No specific project overlap; framework focuses on resilient recovery and reconstruction rather than individual project interventions.
Scaling Up of GLOF Risk Reduction in Northern Pakistan	2017–2023	Complements cryosphere project by linking communities to DRR systems and enhancing GLOF risk management. Enhances cost-effectiveness and geographic coverage; avoids overlap with other projects.
Transforming the Indus Basin with Climate-Resilient Agriculture and Water Management	2019–2026	Increases groundwater availability for irrigation; complements DRR mechanisms for crop loss mitigation. No overlap; focuses on agriculture with water management in different locations.
Enhancing Community, Local, and National Level Urban Climate Change Resilience	2020–2023	Scales water conservation and climate change risk management solutions in urban areas. No overlap with AF project; focuses on different geographic locations and urban areas.
Recharge Pakistan: Building Pakistan's Resilience to Climate Change through Ecosystem-based Adaptation (EbA) and Green Infrastructure	2024–2031	Links with SAFER for mutual learning and integration with Living Indus. No geographic overlap; focuses on different locations for flood and water resource management.
WB-Integrated Flood Resilience and Adaptation Project for Pakistan	2023–2028	Enhances government capacity and coverage through combined efforts. Avoids overlap by aligning with AF project targets and participating in coordination platforms.

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Water quality meter installations ensure groundwater purity, aligning with PEPA's Water Quality Standards for Drinking Water.¶
Technical training courses align with Water and Sanitation Authority's (WASA) Operator Training Manual for sewage and drinking water treatment plants.¶
Specific Pakistani regulations and legislation that are relevant to Components 2 and 3 include:¶
National Water Policy of 2018, to improve freshwater resources' availability, reliability, and quality to meet municipal needs.¶
Khyber Pakhtunkhwa Integrated Water Resources Management Board Ordinance of 2002 to support the Board in acquiring and updating information on local water use and quality patterns.¶
Components 4 and 5¶
The design and execution of community ponds and constructed wetlands meticulously consider relevant water resource management and conservation laws and regulations.¶
Full compliance with essential permits and licences enhance wastewater management and environmental well-being within Pakistan's legal parameters.¶
UNICEF has commissioned 6 separate technical analyses of the constructed wetlands outflow quality by two separate third parties and found it to be well within the range of National Environmental Quality Standards (NEQS) values.¶

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Project Title	Dates	Complementarities
WB-Sindh Flood Emergency Rehabilitation Project	2023–2027	Complements capacity-building and institutional setup for flood-affected areas in Sindh. Focuses on public water supply rehabilitation, with no overlap as AF project target's different locations.
WB-Khyber Pakhtunkhwa Rural Investment and Institutional Support Project	2023–2029	Enhances capacity for monitoring and quality assurance in KP. Avoids overlap by coordinating with AF project interventions and locations.
ADB - Preparing Water and Urban Development Projects	2024–2026	Enhances water sector capacity in Sindh and KP. Lessons Learned: Focuses on evidence generation and institutional capacity building, complementing AF project without overlap.

G. Learning and Knowledge Management

The success and scalability of the proposed project hinge on the creation, cataloguing and effective dissemination of sectoral learning. Accordingly, Component 6 – Adaptive Capacities and Empowered Communities for Strengthened Resilience to Climate Change – reflects this importance. This will be addressed through evidence-based data and knowledge generation and also through strengthening the adaptive capacities that allow (re)learning of ESP practices and behaviours in the context of climate adaptation, in order to foster community-based, inclusive and gender-responsive approaches.

The Knowledge Management component of this project will have three pillars for knowledge generation and customisation, use and capacity building as described below:

- Pillar 1 – Knowledge Generation and Knowledge Customisation: This pillar applies appropriate methodologies and study designs focusing on generating knowledge products from the experience and lessons of the project implementation through case studies, field notes, documenting of project feasibility and technical studies and others and improving the systems within the implementing and executing agencies for documenting and customising knowledge.
- Pillar 2 – Communication, Advocacy & Use: The project will expand the outreach and networks for dissemination, communication, advocacy, and use of knowledge products developed through the project and connect the practitioners, academia, civil society organisations and other stakeholders for exchanging knowledge, and engaging decision makers around key advocacy points identified by the project, including groundwater governance, green energy, and other relevant issues of the project. The project will share the knowledge generated from the project in different platforms including the Living Indus KM platform, government department websites and executing partner websites and through research and academic institutes, organising and participating in relevant sector workshops and events including Pakistan Water Week and other national and international events. The main audience of these knowledge products will be practitioners working in different relevant government departments and civil society organisations, researchers, and programme managers.
- Pillar 3 – Capacity Building: The project will implement targeting and capacity building support to ensure the professional development needs of relevant departments, government lead knowledge platforms like Living Indus KM platform and Clean Green Pakistan index and championship programmes to ensure these platforms have strengthened capacities expand their outreach, improve on quality assurance and produce learning tools widely accessible to support broader capacity building of sector stakeholders.

Furthermore, the proposed concept will be able to avoid duplication and maximise results through synergies, leveraging resources and lessons learnt with other projects. The proposed project will build on, complement, learn from, and augment the results of other projects in Pakistan's Indus Basin. This will build on ICIMOD's 40 years of experience as a regional knowledge broker. In this context, ICIMOD has worked closely with its eight regional member countries to ensure that its organisational commitment to outcomes aligns with areas of regional relevance and that the knowledge produced is actionable and relevant to international, regional, national, and local partners. Accordingly, capturing and disseminating lessons learnt will be an integral part of the fourth component. UNICEF draws on a wealth of global thematic WASH knowledge that can be brought to bear on local context-specific sites. UN Women's extensive experience on application of GEWE concepts in Pakistan context will inform the integration of gender-transformative components that will address inclusive human security considerations. "Gender inclusive" refers to practices and policies that provide equal opportunities for all genders, while "gender transformative" aims to address and improve the underlying social norms and structures related to gender.

Organised demonstration of proven solutions in pilot communities is designed to encourage peer-to-peer learning and increase the potential for adoption and scaling of climate-resilient and adaptive solutions by local communities and governments. Crucially, the project will work to fully integrate its work into the Living Indus Knowledge Platform:

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Deleted: ¶ **Table 10: Complementarity to other projects**¶ **Relevant Project** ... [36]
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Crowdsourcing knowledge menu item. Component 6 of this project will serve as the nascent core of the Initiative to build upon. Annex 11 presents an output-level KM plan to be implemented throughout the project.

H. Consultative Process

Consultations have been shaped in the following manner:

- MoCC&EC: Review the proposed project design and community-level targeting.
- UNCT members have provided input on the project design and targeting, specifically based on the Living Indus Initiative.
- This resulted in a refined list of intervention sites.
- Finally, community consultations in target sites were held, which tested the contextual appropriateness of the individual adaptation solutions proposed, and their potential GESI-related gains.

The stakeholder consultation was conducted at different levels, including federal and provincial government departments, UN agencies working in the water and climate sectors, civil society organisations and research institutes, coordination teams of government water and climate initiatives and specialised agencies. The consultation was mainly designed to receive feedback on targeted interventions, geographic coverage, learn from similar past, understand ongoing and pipeline projects to avoid overlap and ensure complementarity and receive endorsement of the project target and interventions from the designated authorities. The project incorporated the relevant feedback and suggestions received through the stakeholder consultations.

The community consultations were conducted in over 32 representative communities across the project target locations in Sindh, KP and GB. The consultations were conducted through focus group discussions, key informant interviews and community gatherings. The focus group discussions targeted all segments of the society including minority groups in Sindh (Hindus, Christians, Qadiani) and refugees in KP province. To capture the perspectives of women and girls, there were dedicated focus group consultations for women and girls, which helped to identify specific needs of the minorities, women and girls, and informed the project design and geographic targeting.

Consultations were held with various governmental and development stakeholders, including the UN Coordination office and UN agencies in Pakistan, provincial disaster management authorities, planning and development departments, and other relevant organizations. These consultations aimed to brief stakeholders on the SAFER project, seek guidance on engagement and implementation, and review overlaps with other initiatives. Key outcomes include appreciation for community-based approaches and nature-based solutions, the necessity for continuous engagement and collaboration, and the identification of capacity-building needs. Notably, stakeholders such as the Provincial Disaster Management Authority in KP Province, Pakistan Agricultural Research Council, and the Pakistan Meteorological Department highlighted the importance of integrating SAFER activities with existing projects and ensuring compliance with national legislation. Geographic and thematic complementarities were emphasized, ensuring the project's alignment with ongoing initiatives and national priorities.

Community consultations focused on proposed interventions like cryosphere risk preparedness, the construction and rehabilitation of communal ponds, solar water systems, and groundwater recharge. These consultations revealed that communities, especially women and youth, are highly aware of climate change impacts and supportive of adaptive measures. In areas like Tharparkar, interventions such as solar water systems and communal ponds were seen as vital for improving water access and reducing the daily burden on women and girls. In Karachi and Thatta, discussions highlighted women's vulnerabilities and the need for clean water, with gender-responsive policies suggested to enhance climate adaptation outcomes. Women constituted approximately 40% of the participants in these consultations, reflecting significant female engagement. Communities in Sindh recognized the benefits of proposed interventions for reducing waterborne diseases, improving agricultural productivity, and supporting livelihoods. However, they also expressed concerns about potential risks, such as the sustainability of solar systems and the need for proper maintenance and community involvement in implementation. Overall, these consultations underscored the importance of inclusive, participatory approaches in climate adaptation projects.

A total of 15 institutions from the centre and provinces were consulted, along with 27 communities, involving approximately 900 participants in the community consultations, where female representation was 45%. Annex 12 presents details of the stakeholder consultations held with governmental and development sector actors. It also presents consultations with the beneficiary communities, to learn about their views on climate adaptation and proposed intervention in their locality in SAFER Pakistan, and about potential benefits, and possible risks or challenges of proposed interventions. Communities were also asked about their views on the feasibility of the proposed budget and beneficiaries envisaged through the proposed intervention. Community suggestions were welcomed which have been documented separately. An output-level stakeholder engagement plan is given at Annex 13.

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I. Justification for Funding Requested

Table 8 outlines the justification for adaptation actions proposed for this project, providing scenarios for with the project and without the project at the component level.

Table 8: With and Without Project Scenarios

Component/ Output	Baseline (without project)	Adaptation impact (with project)	Evidence base related to the Adaptation Solutions
Component 1: Cryosphere Disaster Risk Reduction	The population in the upper basin is vulnerable to loss of life and property due to limited early warning of impending climate-related cryosphere hazards. Policymakers are not able to accurately amortise infrastructure investment, leading to ineffective investment decisions. Infrastructure Development in the upper basin does not benefit from climate-resilient land use planning, leading to increased destruction of property during disasters.	The population in the target communities has access to the means to participate in cryosphere hazard monitoring and is better able to anticipate hazards and move to safety. Policymakers have better information on cryosphere-related risks to infrastructure, improving infrastructure investment decisions. Construction will be undertaken in more climate-resilient sites, reducing the destruction of property due to climate-induced cryosphere disasters.	The proposed project builds on a large existing body of geospatial, field survey and remote sensing data that ICIMOD has gathered over the past 40 years. This data has also informed UNDP's GLOF 1 and II project design that the critical gap that remains to be closed is wider adoption of the CB-MEWS model, which complements past efforts and increases impact at the community level. For the local coordination context, the fact that the project is integrated deeply into national policy through the Living Indus Initiative will drive uptake and dissemination.
Component 2: Springshed Revival and Management	Springs linked to municipal water supplies in the middle basin are increasingly strained and drying up, causing urban water scarcity, driving negative health outcomes, and may leading to outmigration. Policymakers are not able to rely on springs as a source of municipal water, driving more unsustainable groundwater drilling.	Springs are revived through community-based measures that increase the availability of municipal water for urban populations, partially mitigating the negative effects of water scarcity. Policymakers can make climate-resilient municipal water supply plans in the middle Basin and are equipped to scale up the approach in other communities	Springshed revival is a proven methodology that has been developed by ICIMOD in cooperation with communities in Pakistan and Nepal. For the local governance context, the fact that the project is integrated deeply into national policy through the Living Indus Initiative will drive uptake and dissemination.
Output 3.1: Groundwater mapping and groundwater recharge facilities completed in selected water-scarce locations in the middle basin, including establishing/ strengthening operation, maintenance, and management structures.	Current groundwater extraction rates are not sustainable and risk exhausting it entirely and causing irreparable damage to communities, livelihoods, and the national economy, which relies heavily on it for water-reliant exports.	Groundwater levels will gradually be replenished, and extraction rates will be better managed, leading to a sustainable level of extraction and reducing overall water scarcity.	UNICEF and the PCRWR have studied innovative artificial techniques coupled with integrated watershed management using NbS to enhance groundwater recharge. They have also assessed the feasibility of promoting simple and low-cost-high-efficiency irrigation systems to control abstraction in Pakistan. Recently UNICEF Pakistan and PCRWR have conducted a feasibility study on selected locations.

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Component/ Output	Baseline (without project)	Adaptation impact (with project)	Evidence base related to the Adaptation Solutions
Output 3.2: Climate-smart and resilient water supply infrastructure established in selected sites, along with contextually relevant management structures with adequate capacity for operation and maintenance of the community infrastructure.	Currently most of the community water supply facilities in targeted locations are not designed and built by considering climate change which resulted in damages sue to recurrent flood which severely affected water supply services in the area. In addition, most of existing facilities are using electric grid which is not in constant supply and higher cost of operation.	The water supply infrastructure targeted by this project will be designed and constructed to be climate-resilient for major hazards affecting the area (flood and drought). In addition, use of solar and hand pumping systems will ensure sustainable supply and very low cost of operation and maintenance. These will increase the adaptation capacity for both the communities as well as the infrastructure.	The return of investment analysis conducted by UNICEF in different countries confirmed that the return of investment for solar pumping systems against electric and diesel energy sources indicated that the return of investment for solar pumping systems is very high with an average 10-year lifetime of the project with an average 3-year payoff period for solar systems.
Output 4.1: Targeted intervention sites identified for evidence-based, climate adaptive and focused WASH interventions.	Limited or no data available in targeted locations on the nature-based and cost-effective wastewater treatment alternatives and their feasibility. This with intensive capital requirement for other conventional solution restricted communities and local authorities to plan investments to improve the adaptive capacity of the communities.	The feasibility study and data analysis will help to plan and mobilise resource for nature-based and cost-effective local level solutions for wastewater treatment.	Experience indicated that projects supported with comprehensive feasibility study and data have a very high chance of successes and increase opportunities for resource mobilisation as decision makers need concrete data and evidence to approve investments.
Output 4.2: NbS for sewage treatment demonstrated through constructed wetlands along with proper management structures and adequate capacity for operation and maintenance of wetlands.	In targeted areas wastewater is released to the natural water ways and communal areas through open drains which led to water contamination and multiple environment and health hazard for the communities.	The project will increase adaptive capacity of the targeted communities by reducing water contamination using the wetlands for community recreational or livelihood activities and transferring knowledge and skills to the neighbouring communities to adopt the approach.	The economic and environmental benefit analysis conducted for constructed wetlands in different countries confirmed that wetlands are environment friendly and low-cost alternatives for smaller communities or suburban areas not covered by main sewage systems.
Output 5.1: Government of Sindh supported in systematically prioritising 15 natural waterways and community water ponds to address water storage and wastage issues.	Lack of apocopate studies and comprehensive basin management plan in targeted locations in Sindh flooding is recurrent which resulted in stagnant water across the settlements and community institutions.	The comprehensive study in the targeted locations will help to have basin management plan for flood prone locations and locations affected by stagnant water for extended period after the rainy season which help communities and local authorities to implement adaptive actions to improve the water ways, identify storge locations and reduce water logging in the settlement areas.	Experience in multiple locations and communities indicated that communities and local governments can mobilise to implement local level solutions to reduce water logging and improve water storge. However, limited/lack of all required knowledge and skills either restrict their participation or reduce the impact of their interventions to implement the contextualised adaptation measures.
Output 5.2: 15 selected waterways/ponds in Sindh Province	Currently in targeted areas groundwater salinity is very high and not many freshwater alternatives for the communities	With this intervention the community adaptive capacity will increase by reducing water logging in the settlement areas	Experience in multiple countries including Pakistan shows that community ponds are viable solutions for water

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Component/ Output	Baseline (without project)	Adaptation impact (with project)	Evidence base related to the Adaptation Solutions
restored/rehabilitated, including installation of water quality monitoring systems and establishing and strengthening operation, maintenance, and management structures.	which resulted in local authorities and CSO to rely on expensive reverse osmosis treatment facilities which increase the water cost. In addition, due to limited investment on improving natural waterways. flood and rainwater in target locations create waterlogging in settlements, schools, health centres and other community facilities.	and identifying and improving appropriate locations for water storage through community ponds. The ponds will also improve the water quality in the area through groundwater recharge and provide alternative water source with low treatment costs than saline groundwater.	storage in arid areas and in areas where there is high water salinity. The communities are familiar and conversant with the approach and have the capacity for operation and maintenance without much external support which increase the sustainability of the adaptive solution.
Output 6.1: National and provincial capacities strengthened to apply innovative social and technological tools for establishing and enforcing human-centred and gender-transformative systems of climate change adaptation and accelerating the progress towards management of Indus water resources.	Currently groundwater extraction in Pakistan in general and in targeted locations in particular is completely unregulated and free of charge which resulted in an even use of water where the big industries and commercial agriculture consuming most of the water at the cost of the vulnerable groups. In addition, where there are regulations implementation, coordination and enforcing capacity is very limited at all levels. There are multiple government-led initiatives like Clean Green Pakistan programme and Living Indus which substantially contribute for improving adaptive capacity of the communities in the disaster-prone areas however the capacity of the government to expand the outreach of the initiative across the country, coordinate partners support and mobilise additional resource is very limited.	With the support of this project the institutional and human resource capacity for the government will be improved to develop, implement, and enforce policies and regulatory framework which will improve equitable and socially sustainable water use, revenue generation, reduce water pollution and increase investment especially for women youth for climate action. With this project support enhance coordination, M&E, and IM capacity of the MoCC&EC, MOWR and other government departments including National Commission on Status of Women which will contribute for improved adaptive capacity of the government at different levels and improve and enhance support and participation of the communities in the climate change adaptation initiatives.	Without the right policies, regulatory framework and institutional capacity by the government improving equitable and socially sustainable resource use and increased adaptive capacity of the vulnerable communities will be a big challenge as the privileged and the powerful continue to take advantage of lack of regulation at the cost of the poor and vulnerable. This will increase exposure of vulnerable groups for climate change disasters and limits their adaptation capacities. The capacity of the government is key on coordination of partner's support, identification of priorities and implementation and oversight of the climate change adaptation programmes.
Output 6.2: National and provincial stakeholders have access to strengthened evidence-based data and knowledge for informed decision-making and implementation of climate adaptation and mitigation that foster collaboration across sectors.	There is no centralised knowledge management platform that document, disseminate innovations, new approaches and experiences for different adaptation interventions. Furthermore, there is limited evidence-based data available particularly gender-climate data as well as case studies being done by government, development partners, CSOs and communities that would shed light on the successful	The project will support establishing KM platform for Living Indus initiative and other adaptation measures at the national level together with production, documentation and dissemination of the knowledge and fostering experience sharing and learning of the communities targeted by this project.	Data and KM platforms combined with space for exchanges between practitioners and communities will facilitate learning, scaling up of interventions in different areas adoption of tested knowledge and practices and for evidence-based advocacy for increased investment.

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Component/ Output	Baseline (without project)	Adaptation impact (with project)	Evidence base related to the Adaptation Solutions
	community-led initiatives and practices.		
Output 6.3: Youth and women's leadership as well as community-led adaptation solutions strengthened in climate action through awareness raising and behavioural change campaigns.	There is limited awareness in the larger community on climate change mitigation and adaptation solutions, especially of gender-transformative and climate security risks perspective. There is limited community participation (especially women and girls) in adaptation programmes, thus weak agency and ownership of the people. Communities are not implementing climate programmes and able to take actions on their own adaptive solutions.	Supporting youth and women-led initiatives that aim at mobilising whole communities for climate action. Foster constructive and innovative resilience practices that allow (re)learning of adaptation mechanisms from the perspectives of gender transformative and climate risks.	Application of gender-transformative and social innovation tools as well as community-led campaigns and initiatives will enhance agency and ownership of the communities on climate adaptation and climate risk reduction processes.

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Deleted: Foster constructive and innovative resilience practices that allow (re)learning of adaptation mechanisms from the perspectives of gender transformative and climate risks.

Deleted: Application of gender-transformative and social innovation tools will enhance ownership on adaptation and climate risk reduction processes.

Deleted: Community-led adaptation solutions widely adopted through awareness-raising and behavioural change

Deleted: Communities not implementing adaptive practices, limited community participation (especially women and girls) in adaptation programmes.

J. Sustainability Considerations

Improved and sustainable water management is critical to building the resilience of communities and can support the stabilisation and peaceful mitigation of situations in which environmental pressures, rising demand for water, shifting and unreliable water supplies put communities at risks, which will increase vulnerabilities of communities in the region.

The sustainability considerations for this project encompass various dimensions, mirroring a comprehensive strategy. The focus is on developing NbS, ensuring communities are actively involved in decision-making processes as an essential part of the sustainability approach of the project. Institutional sustainability involves planning for system- and service-level improvements and fostering learning of new capacities that promote whole-of-society and inclusive approaches within institutions. Government ownership and sustainability of services in targeted communities are ensured through coordinated efforts with local counterparts. SAFER Pakistan plans to collaborate with local levels to enhance their capacity for operating and maintaining project activities, reviewing technical and managerial capacities, knowledge, and data availability, and fostering improved coordination and collaboration among relevant stakeholders. Financial sustainability is addressed through the effective handover of project interventions, ensuring ownership by involved departments and inclusion in government maintenance planning. The project will also ensure the involvement of women and youth, making sure their needs related to project activities are understood and that they are able to meaningfully participate in the project activities and further gain recognised agency to take climate action together with partners beyond the project. Below are the details of various dimensions of sustainability the project will implement to ensure sustainable services and environment:

- **Technical** – Technical elements of sustainability, mostly related to infrastructure and data availability includes ensuring risk assessments are conducted and structural designs are adjusted, to adapt to or mitigate these risks. This may include an understanding of seasonal water variability versus demand, how to adapt infrastructure to risks associated with flooding or other climactic risks. It will also support locally appropriate technologies.
- **Socio-economic** – An understanding of the socio-economic conditions of communities is vital to the sustainability of project interventions. This includes involving local communities in planning and decision-making processes from the outset and recognising the community's role and ownership of the work undertaken. Establishing appropriate cost recovery and tariff collection mechanisms and establishing and strengthening community management structures.
- **Environmental** – Understanding the environmental impact of project activities and ensuring these elements are considered throughout project implementation for the long-term sustainability of the project. Depending on the activity, this may include a greater understanding of the nature of the watershed, understanding land use, water use and options for diversification, opportunity to implement NbS to enhance ability of systems and communities to cope with a changing climate.
- **Institutional** – Support for institutional elements includes engagement on policy, capacity, and service improvements, working at local levels to improve the capacity of service providers to operate and maintain project activities. This includes technical and managerial capacity, data availability and management. To ensure financial

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sustainability, formal handovers of interventions to ensure government aims to result in the inclusion of activities in the Government's regular planning and support models for cost recovery.

The interventions to support targeted sustainability of each project component related to technical, socioeconomic, environmental, and institutional elements are highlighted in Annex 14.

K. Environmental and Social Impacts and Risks

ICIMOD (RIE) has a well-defined Environmental and Social Management System (ESMS) in place which helped in screening and impact assessment of the proposed project. It will be used for monitoring the implementation of the Environmental and Social Management Plan (ESMP) developed as a result of the Environmental and Social Impact Assessment (ESIA), which was carried out for the proposed project in a systematic and consultative manner. This entailed initial environmental and social (E&S) screening and broader assessment resulting into E&S categorisation of the project at the Concept Note stage (Annex 3). At the same time, the project was screened against Adaptation Fund ESP, followed by more detailed E&S screening and impact analysis for the entire project for developing full proposal, and E&S management planning for the environmentally and socially sensitive activities planned under the project (Annex 3). The results of the E&S screening against Adaptation Fund ESP are shown in Table 9, while output-level screening against the criteria set by the national environmental legislation is presented at Annex 3. Both sets of screening, and the following ESIA confirm that most of the project interventions have no adverse E&S impacts; requiring no further E&S management planning. However, a few interventions are expected to have some E&S impacts. Though manageable, this will require careful management planning to mitigate these impacts. Therefore, **overall, the project is placed under E&S Category B.** Based on the ESIA of the project, an ESMP has been developed for the outputs categorised as B and presented at Annex 3.

Table 9: E&S Screening against ESP

E&S Principles	No further assessment is required for compliance	Potential impacts and risks – further assessment and management required for compliance
1. Compliance with the Law	As per national and subnational environmental protection laws, the activities planned under components 1, 2 and 6, have no environmental and social impacts, hence; categorised as C and do not require any environmental and social impact assessment (ESIA). Similarly, some of the planned activities under outcomes 3, 4 and 5 also fall under Category C.	Some activities under components 3, 4 and 5 are expected to have adverse but manageable environmental and social impacts; hence, categorised as B and have been subject to complete ESIA as per scope and location of the activity and the E&S legislation of the relevant geography within Pakistan as following: • Activities under Outputs 2.2 (recharge pits, trenches, absorption terraces, small ponds & check dams at 10 locations), 3.2 (100 solar-powered water facilities and 60 handpumps) and 4.2 (8 constructed wetlands) in KP will require development and submission of Initial Environmental Examination (IEE) to the KP EPA. • Activities under outputs 3.2 (100 solar-powered water facilities and 60 handpumps), 4.2 (8 constructed wetlands) and 5.2 (15 waterways/community ponds) in Sindh require development and submission of Checklists to the Sindh EPA before starting the implementation. Following the ESIA, ESMP has been developed for these activities and provided at Annex 3. However, these activities would need to obtain Environmental Approval from the respective EPAs before initiation. However, a few activities will remain unidentified sub-projects (USPs) so the RIE's ESMS will be deployed at the time of implementation to assess and mitigate the adverse impacts of such activities.
2. Access and Equity	No adverse impacts in terms of access and equity are expected from the project interventions. The project implementation will build upon community mobilisation, and inclusive and sustainable development principles; hence, ensuring an equitable	

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E&S Principles	No further assessment is required for compliance	Potential impacts and risks – further assessment and management required for compliance
	and inclusive benefit sharing through the project interventions without any discrimination or favouritism.	
3. Marginalized and Vulnerable Groups	In certain project areas, there are some marginalised groups such as Kailash in Chitral district and Kolhi in Tharparkar district who have been identified and included in the consultations. In ensuring do-no-harm approach, the project respects the identities of all groups and avoids any discrimination or negative impacts to any groups due to the project activities. The disaggregated data collection and reporting will take transparent and accountable approach. The active involvement of the communities in the project implementation as well as the monitoring and evaluation mechanisms of the project will ensure that neither marginalised nor vulnerable groups face any disproportionate risk.	In some parts of the project areas, there are some marginalised groups such as Kailash in Chitral district and Kolhi in Tharparkar district who have already been included in the consultations and would be paid special attention to during the project implementation. However, these groups do not face any discrimination because of their different identity and will not have any disproportionate impact due to the project activities. The vulnerable groups including elderly, women and children have already been identified during the community consultations and their voices and needs have been incorporated into the project design. Moreover, the project prioritises equitable engagement with all communities, for example, these groups have already been included in the consultations and their voices and needs have been incorporated into the project design. This will continue throughout the project implementation with a special attention being paid that the groups are equally benefitting from the project. The disaggregated data collection and reporting during the project implementation will ensure that neither marginalised nor vulnerable groups face any disproportionate risk or is excluded from project benefit. Appropriate mitigation measure have been included in the ESMP (Annex 3).
4. Human Rights	Pakistan is a signatory to the Universal Declaration of Human Rights (UDHR) and does not fall under special procedures of the Human Rights Council. Being highly participatory in nature, the project does not pose any risk of human rights violation.	Nevertheless, the project would remain cognizant of this ESP principal and keep reporting on it regularly. Human rights-based approach will be a guiding principle of the project implementation. The project's highly participatory nature is a core strength that mitigates the risk of human rights violations. However, unwavering vigilance is key. The project will remain cognisant of this ESP principal for chance find and keep reporting on it regularly.
5. Gender Equality and Women's Empowerment		The project will ensure that none of its activities have any gender-specific negative impacts on the target beneficiaries but most importantly actively seeks to promote gender equality and women's empowerment through strategic integration of gender-transformative components across all project activities. Pakistan's Climate Change Gender Action Plan (2022) is a good starting point for gender-sensitive climate adaptation action that is both inclusive and socially sustainable. The RIE and Executing Entities (EEs) are cognisant of the GESI issues in Pakistan; hence, have undertaken a thorough gender analysis (Annex 5). The consultations have also informed the project design on GESI issues, particularly consultations with women beneficiaries. As detailed in the Gender Action Plan, the project will promote equal participation of women, offer targeted capacity and skills building on gender and women's empowerment, address gender inequalities and foster positive change in gender norms that hinder sustainable and inclusive climate action. For example, the assessments planned as part of

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E&S Principles	No further assessment is required for compliance	Potential impacts and risks – further assessment and management required for compliance
		the project will consider the specific needs and priorities of women but also their perspectives and solutions that will guide the technical infrastructure components towards ensuring that project benefits all members of the community equally.
6. Core Labour Rights		Pakistan has ratified 36 ILO Conventions, including all eight Fundamental Conventions; so, every project in Pakistan is bound to respect these conventions. The project itself will comply with the 1998 ILO Declaration of Fundamental Principles and Rights at Work, and its convention on fundamental principles and rights (ILO 29, ILO 87, ILO 98, ILO 100, ILO 105, ILO 111, ILO 138 and ILO 182). The project will also ensure that the applicable labour laws, especially about minimum wage, fixed working hours, and occupational health and safety, are followed in letter and spirit for implementation of activities under Outputs 2.2, 3.2, 4.2 and 5.2. Also, child labour is prohibited under the Pakistan Penal Code; hence the project will ensure that no child under the age of 18 is hired for any type of labour. Specific measures have been proposed for Category B activities in the ESMP (Annex 3).
7. Indigenous Peoples	Except in parts of Chitral district, the project areas do not have any reported Indigenous peoples.	The Constitution of Pakistan does not recognise any group of people in Pakistan as Indigenous. However, based on WB E&S practices for earlier projects, the Kailash people in parts of Chitral district are considered as Indigenous for whom the project will develop Indigenous Peoples Plan during the project implementation. The project is cognizant of the provisions under the 2007 UN Declaration on the Rights of Indigenous Peoples (UNDRIP) and has obtained Free, Prior, Informed Consent (FPIC) of the Kailash people during the consultations for project design, The same will be followed during implementation of the project.
8. Involuntary Resettlement	The initial screening of the project activities and sites informs that there is no involuntary resettlement (either physical or economic displacement) required as the sites are either under the same use or belong to the communities who have consented to allocate the land, if needed, on voluntary basis. The project, in fact, will protect and create more livelihood opportunities for the communities through its structural and non-structural measures. Nevertheless, as some of the project activities under Outputs 2.2, 3.2, 4.2 and 5.2 are expected to have adverse but manageable E&S impacts (categorised as B), an ESIA was conducted during the proposal development to find any cases of involuntary resettlement. Resultantly,	

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The project is cognisant of the provisions under the 2007 UN Declaration on the Rights of Indigenous Peoples (UNDRIP) and has obtained Free, Prior, Informed Consent (FPIC) of the Kailash people during the consultations for project design. The same will be followed during implementation of the project.

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E&S Principles	No further assessment is required for compliance	Potential impacts and risks – further assessment and management required for compliance
	no case of involuntary settlement has been found.	
9. Protection of Natural Habitats	None of the project sites fall under protected areas regime under any international convention, or the federal, provincial and sub-national laws. Hence, none of the project activities is planned in habitats for plants/animals of ecological importance.	
10. Conservation of Biological Diversity	The project is not expected to have any significant or unjustified reduction or loss of biological diversity in the project area. Rather, it is designed to have a positive impact on the biodiversity in the project areas through increased availability of water, protection of water bodies, and managing the surface and groundwater contamination through its activities under Outputs 2.2, 3.2, 4.2 and 5.2. The project is also not introducing any invasive species in the project area.	
11. Climate Change	None of the project activities are expected to result in increased emission of GHGs or other drivers of climate change; rather the constructed wetlands (Output 4.2) and waterways/community ponds (Output 5.2) will serve as Carbon sinks. Also, the activities under Output 2.2 will result in groundwater recharge, mitigating the climate change impacts. Hence, the project will not exacerbate climate change in any manner. The solarisation of the water facilities will further reduce GHG emissions, otherwise accruing from use of fossil fuels.	
12. Pollution Prevention and Resource Efficiency		The proposed project is a mix of knowledge and physical activities. To be executed by environmentally and socially responsible RIE and EEs, there will be minimal and most optimal resource utilisation for its activities. The project is also cognizant of any possible land, air or water pollution caused because of activities under Outputs 2.2 (recharge pits, trenches, absorption terraces, small ponds & check dams at 10 locations), 3.2 (100 solar-powered water facilities and 60 handpumps) and 4.2 (8 constructed wetlands) and 5.2 (15 waterways/community ponds) and will implement all preventive and mitigation measure proposed by the ESMP prepared as a result of ESIA (Annex 3).
13. Public Health	The ESIA identified no public health impacts accruing of the proposed activities. However, a health impact-screening checklist has been used in synch with the ESA tools to identify any possible public health risks and propose appropriate mitigation	

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E&S Principles	No further assessment is required for compliance	Potential impacts and risks – further assessment and management required for compliance
	measures for the same. As a result, no adverse public health impacts accruing from the project activities have been identified.	
14. Physical and Cultural Heritage		Pakistan has ratified the Convention Concerning the Protection of the World Cultural and Natural Heritage; hence, all projects in Pakistan are bound to comply with its provision. The ESIA informs that none of the project sites is in or near a site that has historic, or cultural importance. The project will remain cognisant of the fact that none of its activities should offend the local population, damage the local social fabric, and generate conflict with the local community. The RIE and EEs will remain alert while implementing ESMP (Annex 3) to avoid any such possibility or to tackle any chance find.
15. Lands and Soil Conservation		Cognisant of the fact that fragile soils may be present in some of the project areas (mountainous areas of Gilgit-Baltistan and coastal areas of Badin and Sujawal districts), the project sites have been selected carefully, so that none of the activities are implemented on productive and valuable lands in the project areas. In this context, the project has proposed precautionary measures in the ESMP (Annex 3) to avoid any such possibility or to tackle any chance find.

K.1. Environmental and Social Impact Analysis and Management Planning

Building upon the initial E&S screening against the ESP principles, and national E&S impact assessment criteria, all project activities have been analysed for any adverse environmental and social impacts using the standard E&S assessment procedure. As a result, some of the activities under Outputs 2.2, 3.2, 4.2 and 5.2 have been found to have some adverse but reversible environmental and social impacts; hence categorised as 'B'. The activities planned under the rest of the outputs, and some of the activities under Outputs 2.2, 3.2, 4.2 and 5.2, are categorised as 'C', having no adverse environmental or social impacts. These activities do not need further management planning as per ESP 1 and the national and sub-national environmental regulations.

Annex 3 provides a snapshot of the ESIA conducted for the project's proposed activities and their potential risks and impact assessment against the 15 principles as well as national and subnational environmental regulations. This resulted in the development of ESMP for Outputs 2.2, 3.2, 4.2 and 5.2 (Category B) provided in Annex 3.

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PART III: IMPLEMENTATION ARRANGEMENTS

A. Project Management Arrangements

A.1. Implementation Arrangements

The following mechanisms for project execution, coordination, oversight, and transfer of funds have been agreed in close coordination with the MoCC&EC, as the national designated authority to the Adaptation Fund, as well as other key stakeholders at the national level, including UNICEF and UN Women. Stakeholders at the sub-national level were consulted. These consultations are outlined in Section II/H.

A.1.1. Regional Implementing Entity (RIE)

Project oversight lies with the Regional Implementing Entity led by the responsible officer from the ICIMOD HQ, supported by the Project Management Team. This will ensure that project management complies with ICIMOD standards and requirements, particularly regarding financial management, timely delivery, and the Environmental and Social and Gender Policy Compliance Plan. RIE (ICIMOD) and National Designated Authority (NDA, MoCC&EC) will sign a joint Memorandum of Understanding as a legal commitment to implement the project.

ICIMOD will enter into an Agreement of Cooperation (AoC) with each agency (Executing Entities), mentioned in Section III/A.1 to execute the respective activities that will lead to the described outputs. An AoC is a formal legal mechanism that creates accountability, manages fund-flow, and ensures that Executing Entities deliver their activities in accordance with the project budget, workplan, and in compliance with the project's Environmental and Social and Gender Management and Compliance Plan.

Having unique expertise in cryosphere risk management and pioneering work in springshed management, ICIMOD will also be an Executing Entity for the Components 1 (Cryosphere) and 2 (Springs). Justification of this proposal is provided in Section III/A.2.

A.1.2. Project Management Team (PMT)

The PMT will be comprised of a Project Manager, Finance Officer, M&E Officer, GESI Officer and Communications Officer, all of whom will be appointed in compliance with ICIMOD's HR rules and regulations. The PMT will be led by the Project Manager who will report to the RIE. The PMT will be responsible for managing project activities and ensuring compliance with all commitments contained in the project document, particularly the Environmental and Social and Gender Policy Compliance Plan (which ensures compliance with the 15 principles of the Adaptation Fund Environmental and Social Policy and the Gender Policy of the Adaptation Fund). The PMT will also take the lead in monitoring activities implemented through regular visits to the field sites in the provinces of Sindh, Khyber Pakhtunkhwa, and Gilgit-Baltistan. The PMT will develop a Monitoring and Evaluation Plan during the project's inception phase, which will be distributed to target stakeholders.

The PMT's major functions include:

- Strategic planning and budgeting, management, and coordination
- Ensure smooth implementation of activities and commitments in Results Framework by Executing Entities
- Monitor and review delivery against milestones and financial progress.
- Consolidate physical/technical and financial progress reports for submission to RIE, and Adaptation Fund Board
- Review and keep track of portfolio level risks.
- Provide technical support on project results monitoring and safeguards compliance to Executing Entities
- Knowledge management of the overall project

As representative of the RIE (ICIMOD) of the Adaptation Fund, PMT will be involved in periodic monitoring (on-site and off-site) of the project. The periodicity and structure of monitoring are as follows:

- On-site detailed round of monitoring of field activities will be done on a quarterly basis.
- Quarterly report submission formats will be designed for submission by Executing Entities for desk appraisal of progress.
- Progress reporting would be done to the AFB biannually or as advised by the AF.

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Table 14: E&S impact analysis¶
Project Output and Activities under Category B ... [44]

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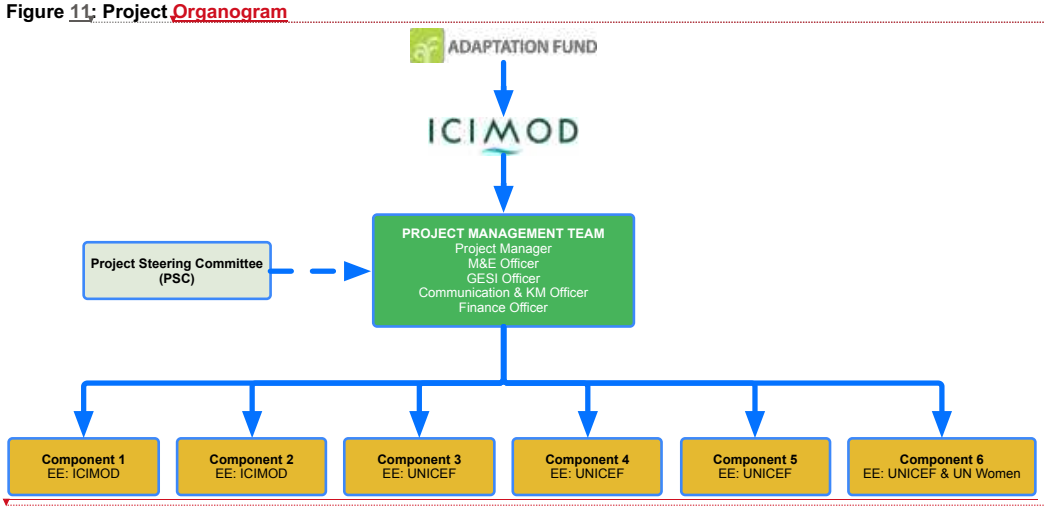
Figure 11: Project Organogram



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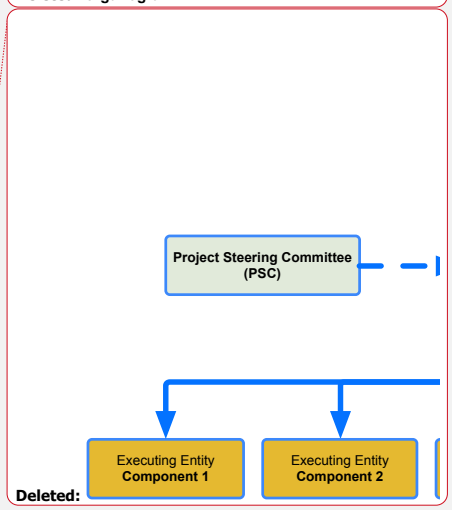

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A.1.3. Project Steering Committee (PSC)

A Project Steering Committee will be constituted to provide strategic guidance on the overall implementation and achievement of the project outcomes. The Project Manager will act as Secretary to the PSC. The composition of the PSC will be as follows:

1. Secretary, MoCC&EC & AF NDA (Chair) or a nominee
2. Secretary, MNFR&S, or a nominee
3. Additional Chief Secretary (Dev), Planning & Development Department of Sindh or a nominee
4. Additional Chief Secretary (Dev), Planning & Development Department of Khyber Pakhtunkhwa or a nominee
5. Additional Chief Secretary (Dev), Planning & Development Department of Gilgit-Baltistan or a nominee
6. ICIMOD Representative
7. UNICEF Representative
8. UN Women Representative
9. Project Manager (PM) – SAFER Pakistan (Member/Secretary)

The membership structure ensures inclusive representation from the three provinces and relevant ministries, across different levels of government and official representation. The PSC's primary responsibilities will be to provide strategic guidance on the implementation and progress against the workplan and oversee compliance with the Environmental and Social and Gender Policy Compliance Plan. The governance structure of the project is presented in Figure 11. In this regard, the PSC will:

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- Review and endorse the project inception report.
- Review project activity status reports to ensure activities are implemented as planned and expected outcomes are achieved.
- Support PMT to maintain complementarity between the proposed project and key planned and ongoing initiatives in the Indus Basin such as Recharge Pakistan (led by WWF), Transforming the Indus Basin with climate-resilient agriculture and water management (led by FAO), Scaling-up of GLOF risk reduction in Northern Pakistan (led by UNDP) and Water Management for Enhanced Productivity (led by IWMI) etc.
- The minimum quorum of steering committee will be chair or co-chair and two members.

The PSC will meet on inception, in yearly intervals throughout the project implementation, and if an additional meeting is needed on an exceptional basis, the Chair, in consultation with the PMT will convene special meetings for urgent matters.

A.1.4. Legal and Financial Arrangements

ICIMOD and MoCC&EC will sign a Memorandum of Understanding as a legal commitment to implement the project. The Secretary, MoCC&EC will chair the PSC. Another senior official from the & AF NDA will be designated as the focal point for the project.

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ICIMOD will work closely with UNICEF and UN Women (EEs) for delivering the project. However, given the relatively small but crucial financial cost of the UN Women component, ICIMOD as RIE will enter into a single Agreement of Collaboration (AoC) with UNICEF that includes the cost of UN Women's work. Subsequently, UNICEF and UN Women will formalise their collaboration through an Agency-to-Agency (AA) Agreement. Under this arrangement, UN Women will assume all reporting and monitoring responsibilities in accordance with Adaptation Fund guidelines. This structure enables both agencies to leverage their respective strengths, ensuring more effective and efficient achievement of the project's objectives. The AoCs will provide the contractual basis to ensure timely delivery, compliance with the technical designs outlined in this project document, and compliance with the E&S Management Plan (Annex 3) and Gender Action Plan (Annex 5)**Error! Reference source not found.**

For the financial management of the project the financial policy and procedures of ICIMOD will apply. This includes financial reporting requirements, need for submission of copies of supporting documents of expenditure, need for maintenance of accounting records for the required time for review and audits. This will be detailed out in the letter of agreements and such requirements will equally apply to grantees and sub-grantees if any engaged by the grantees. Any financial management related additional requirements from Adaptation Fund will also apply to the grantees and sub- grantees.

Financial risks will be monitored and assessed by the ICIMOD Finance Department on an ongoing basis throughout the implementation of the project. The financial management structure of the PMT comprises of a Finance Officer who will be assigned to the PMT and reporting directly to the Project Manager.

All the agreements will be governed by and construed in accordance with the laws of Government of Nepal as RIE is housed in Nepal.

A.2. Role and Responsibilities of the Executing Entities

ICIMOD's extensive expertise in cryosphere risk management and pioneering work in Springshed Management uniquely position it to execute the Cryosphere and Springs components of the SAFER Pakistan project. In the HKH region, no other institution matches ICIMOD's depth of knowledge and experience in these areas. ICIMOD's innovative Community-Based Flood Early Warning Systems (CBFEWS) and comprehensive strategies for managing glacial hazards demonstrate their ability to empower local communities and influence policy effectively. Additionally, their holistic approach to Springshed Management, which includes sustainable land management and pollution control, ensures the long-term sustainability and resilience of spring water sources. This unparalleled expertise makes ICIMOD the ideal leader for these critical interventions in Pakistan's high-altitude regions.

UNICEF is the executing agency for components 3, 4, 5 and Part of component 6. UNICEF will be using existing technical and operation teams in Islamabad, Sindh and KP for implementation of the programme. UNICEF has over 350 multisectoral staff across Pakistan. The main team members leading the execution of the project will be the Climate change and WASH teams, Social and Behavioural Change teams, gender advisor and gender officers, Programme Monitoring and Data management, communication and advocacy and operation teams in Islamabad, Sindh and KP.

The UNICEF hire the services of engineering firm and the construction companies and vendors for the direct execution of the works and services through the UNICEF supply section. Procurement Services are activities undertaken by UNICEF on behalf of eligible partners for the purchase of supplies, equipment, and services. UNICEF is permitted under UNICEF Financial Regulation 5.2 and Financial Rules 105.5 to 105.8, to make arrangements with eligible partners to undertake Procurement Services where such materials and services are required for purposes related to UNICEF activities and consistent with the aims and policies of UNICEF.

UN Women will be the executing agency for part of component 6 in coordination with UNICEF. UNICEF and UN Women have experiences on jointly implementing community mobilization, youth engagement and system strengthening interventions. Both agencies will build on a complementary team for implementation of the component 6 of the project.

Executing Entities will:

- Ensure the work is executed and results delivered in accordance with the sanctioned project document and other conditions stipulated at the time of sanction or from time to time by the RIE (ICIMOD).
- Maintain competent technical staff for project implementation.
- Be required to collect, maintain, and furnish specific information for the purpose of monitoring the impact of various project measures to determine the delivery of specified results.
- Coordinate the implementation of project activities within their respective project sites.
- Ensure effective and timely implementation of the project activities.
- Ensure effective, efficient, and economic utilisation of resources.
- Prepare and submit physical/technical and financial progress reports to PMT.
- Liaise with the RIE/PMT on projects implementation.
- Manage and mitigate project level risks.

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A.3. Implementation Arrangement Alignment with Adaptation Fund Gender Policy

The implementation arrangements will be in full compliance with the Adaptation Fund Gender Policy. The project will always consult with stakeholders in a gender responsive and gender equal way. The project will actively support the increased participation of women as important stakeholders and will guarantee the inclusion of their needs, concerns and abilities in project planning, implementation and monitoring and evaluation.

The project will follow concrete principles on gender-responsive participation and consultation as detailed in Annex 5.

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A.4. Periodic Progress Reporting

The respective Executing Entities, using the RIE's prescribed reporting formats, shall submit periodic progress reports (both technical and financial) to the PMT. The RIE, with endorsement from the NDA, shall submit reports to the Adaptation Fund Secretariat. All reporting will be supervised by the RIE. The grant agreements to be signed with the sub-contractors shall specify all terms and conditions fulfilling all reporting standards designed by the RIE.

A.5. Monitoring and Evaluation Plan

The project results as outlined in the Results Framework will be monitored quarterly and evaluated periodically during project implementation to ensure the project effectively achieves these results.

A.5.1. M&E Tools

A.5.1.1. Project Baseline

At the inception stage, the project baseline will be established for the project areas through secondary and, if needed, primary data. This baseline will provide benchmark for the monitoring and measuring the project performance against the indicators given in the Results Framework.

A.5.1.2. Project Monitoring Report (PMR)

The Project Manager will provide objective input to the quarterly PMR covering the reporting period for each quarter of project implementation.

The Project Manager will ensure that the indicators included in the project results framework are monitored in advance of the PIR submission deadline so that progress can be reported in the PIR. Any environmental and social risks and related management plans will be monitored regularly, and progress will be reported in the PMR.

The PMR will be submitted to the PSC. The quality rating of each PMR will be used to inform the preparation of the subsequent PMR.

A.5.1.3. Mid-Term Review (MTR)

An independent mid-term review process will begin after the PMR due in the project mid-term period has been submitted to the PSC and the MTR report will be submitted to the PSC within the same year. This MTR will serve as midline assessment of the project, as mentioned in the Results Framework.

The MTR findings and responses outlined in the management response will be incorporated as recommendations for enhanced implementation during the final half of the project's duration. The terms of reference (TOR) for the MTR will be approved by the PSC.

The review will be independent, impartial, and rigorous. The consultants that will be hired to undertake the assignment will be independent of organisations that were involved in designing, executing, or advising on the project to be evaluated. The final MTR report will be available in English and will be cleared and approved by the PSC.

A.5.1.4. Terminal Evaluation (TE)

An independent terminal evaluation (TE) will take place upon completion of all major project outputs and activities and will serve as endline assessment of the project, as mentioned in the Results Framework. The terminal evaluation process will begin three months before the operational closure of the project allowing the evaluation mission to proceed while the project team is still in place, yet ensuring the project is close enough to completion for the evaluation team to reach conclusions on key aspects such as project sustainability. The Project Manager will remain on contract until the TE report and management response have been finalised.

The TOR for the final TE report will be approved by the PSC. The evaluation will be independent, impartial, and rigorous. The consultants that will be hired to undertake the assignment will be independent from organisations that were involved in designing, executing, or advising on the project to be evaluated. The final TE report will be cleared and approved by the PSC.

A.5.2. Lessons Learned and Knowledge Generation

Results from the project will be disseminated within and beyond the project intervention area through existing information-sharing networks and forums. The project will identify and participate, as relevant and appropriate, in scientific, policy-based, and/or any other networks, which may be of benefit to the project. The project will identify, analyse, and share lessons learned that might be beneficial to the design and implementation of similar projects and disseminate these lessons widely.

B. Financial and Project Risk Management

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B.1. Operationalisation of Risk Management Strategy

ICIMOD as RIE will operationalise its risk management strategy in the following manner:

- Risks will be identified and assessed along the results chain from activity to impacts. The theory of change and impact pathways development workshop will identify and assess risks for each of the activities and results.
- Risks will be identified and assessed as part of the implementation plan. Both internal and external risks will be assessed, and mitigation measures will be identified.
- At RIE (ICIMOD) level, risks are identified and assessed as part of its medium-term action planning processes. These risks include institutional, financial, and programmatic.
- Risks assessment and reporting will be mandatory for the Executing Entities as part of their Letter of Agreement.
- Risks are assessed and reported on biannual basis through the RIE's (ICIMOD) online system and has been explained in the MEL Guideline based on detailed risk assessments also by executing entities.

B.2. Responsibilities and Decision-Making Processes in Mitigating Risks

The primary responsibility for identifying risks and managing those lies with management at all levels.

- **Director General:** The Director General approves the recommendations of the Senior Management Committee (SMC) related to the strategic nature of risks pertaining to ICIMOD's reputation and strategic functions. The Director General is accountable to the ICIMOD Board of Governors for the development and achievement of ICIMOD's strategy and results, including the overall management of risks to these strategic results. The Board approves the risks management strategy.
- **Senior Management Committee (SMC):** The SMC makes decisions related to new emerging institutional level risks and address major risks brought to its attention, including proposing or supporting the implementation of the mitigation plans proposed. The SMC includes risk management in its agenda as and when required.
- **Strategic Planning and M&E (SPM&E):** The SPM&E Unit provides assurance on the risk management framework and provides advisory services to support the management's decision-making. It specifically provides assurance that controls are well designed and applied to mitigate risks or take opportunities. SPM&E also provides updates to SMC on the progress related to various programmes and the unit level risks. In addition, it provides tools and techniques to analyse and control risks. It works closely with the finance and other central support units in managing risks and linking to internal audit work.
- The **Strategic Group Lead** is responsible for assessing the potential risks and formalising them during the project design and implementation stage. Risks identified during the inception workshop and documented in the project design, specifically in the results framework, will serve as a basis for discussion with respective funding agencies.
- **Unit Heads, Action Area Coordinators and Country Focal Points:** Responsible for managing risks which pose the greatest challenge to the achievement of the outcomes in their respective functions.

B.3. Financial Risk Management

Major Risks	Risk Rating	Mitigation Measures
Internal control risk	I (H), O (L)	The internal control processes that have been developed for project operations and administrative functions are tight and robust. ICIMOD's internal control systems are regularly assessed and have been approved by donors. To maintain this status, we continuously monitor and upgrade our systems using the automated enterprise resource planning system (ERP) and other internal administrative processes. An internal audit function is in place for regular auditing of accounting.
Partners capacity in financial management, M&E and gender may pose risk to ICIMOD	I (H), O (L)	ICIMOD undertakes capacity gap assessments of key implementing partners and conducts various capacity building activities through technical trainings including other areas of gender mainstreaming, financial management capacity strengthening.

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Major Risks	Risk Rating	Mitigation Measures
Financial management information for decision-making	I (H), O (L)	Financial information is produced for management in a monthly management report. All financial transactions are captured and recorded consistently across all programmes and projects.
Internal audit function	I (H), O (L)	Our internal auditor is an outsourced accounting firm independent of the management. The internal audit unit mainly covers the review of internal control, ensures compliance with laws and regulations in all respect, assists management in the detection of fraud and error, and coordinates with the external audit function. Internal auditors issue their report to the Director General. The findings of the internal audit are agreed and acted upon.
Fraud and corruption may hamper the institutional performance at any level	I (H), O (L)	ICIMOD has a zero-tolerance policy on fraud and corruption. The policy is reflected in all accounting procedures and reporting processes both internally and externally. All executing agencies have well established fraud mitigation measures and procurement policies.
Monitoring and evaluation processes and systems	I (H), O (L)	ICIMOD has an approved MEL Framework and Plan that describes our monitoring and evaluation policies, procedures, and guidelines. We have a trimester review process for institutional and programmatic performance. Through this process, we monitor our progress, risks, and lessons. We do both internal and external reviews of our programmes and initiatives. We do impact assessments using both qualitative and quantitative rigorous methodologies.
IT System (Financial, Operational and HR)	I (H), O (L)	ICIMOD has a robust IT system with Microsoft Dynamics Navision 2013 R2 for financial and HR systems. The systems are local with the server hosted on-site.
Financial data storage and security risks	I (H), O (L)	We use a FortiGate 200B as an antivirus firewall which secures the internal network from outside intrusions. ISCSI storage with 100TB capacity is used for data storage and backup. As a part of the Business Continuity Plan, an offsite backup site at Godavari with another 100 TB data storage device is connected to the main office via fibre optic cable and is replicated with the backup device in the main office. As part of the ISMS implementation, we are coming up with a separate IT policy as part of the Admin and Finance Policy.
Effective procurement systems and processes	I (H), O (L)	The effective procurement systems and processes are in place which just provide clear and efficient guidelines in execution of the procurement of goods and services for different threshold values. Any procurement with value from US$500-10,000 is carried out by obtaining at least three written competitive quotations from capable suppliers while the procurement with value more than US$10,000 -30,000 is executed through sealed bids competition from competent and qualified suppliers in the market. Any proposed procurement exceeding US$30,000 is carried forward through the Capital Expenditure Committee headed by the Director General.
Agreement instruments in dealing with partners	I (L), O (L)	The Letter of Agreement (LoA) provides the basis for the funding agreements with the implementing partners and can be tracked based on their deliverables. The sanction provisions are included for non-delivery of agreed outputs deliverable, results.
Transparency commitments for financial information	I (H), O (L)	ICIMOD's annual audited financial statements are published as part of the annual report, which is publicly available for distribution and posted on ICIMOD's website.
Fraud and corruption: Malpractice on the part of internal or external actors hampers institutional performance, leading to trust issues with funding agencies.	I (H), O (L)	Given the challenges in the region, we will remain vigilant in terms of monitoring, reporting and financial management at various levels. We will also make our due diligence process more robust to detect and report well in time and even at any stage if such challenges arise.

Notes: H = high, M = medium, L = low; I = impact, O = probability of occurrence

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B.4. Project Risk Management

Major Risks	Risk Rating	Mitigation Measures
Fragmented partnerships: Past independent practices of government partners might impede establishing collaborative relationships, delaying effective cooperation.	I: 3 O: 2	The project design ensured establishment of clear communication channels, shared goals, and cooperative strategies among government partners to overcome past independent practices. An inclusive Project Steering Committee (PSC) is designed which include key officials from Federal Government, Provincial Government, implementing entity and executing entities including UNICEF and UN Women.
Sustainability challenges: There's a risk of reverting to unsustainable practices by land users and local communities once the project concludes.	I: 4 O: 1	All five groundwork components of the project have strong community engagement, alongside capacity building at various level is ensured. Component – 6 focuses on institutional strengthening both for policy and regulation as well as mobilisation and behavioural change at community level for long-term support systems to ensure continued adoption of sustainable practices post-project. (Section II/J)
Limited awareness and preparedness: Communities and government staff may struggle to adopt new technologies and practices due to inadequate awareness and preparation.	I: 2 O: 1	A large part of activities focuses on community engagement programmes, workshops, and hands-on training for new technologies and practices to enhance awareness and readiness. Executing agencies has well established field presence and close working relationship with the government and communities
Community conflicts: Conflicts between communities over disaster risk reduction approaches, water management, planning, and land use as well as grievances over resources could emerge, impacting project objectives.	I: 2 O: 2	The project implementation will focus on fostering participatory decision-making, employing conflict resolution techniques (conflict-sensitivity and Do-No-Harm approaches), and promote shared understanding through community consultations. These notions are integrated into all capacity building activities and engagement with the government and communities.
Climate-related disruptions: Extreme weather events like floods could halt project implementation for up to six months, compounded by reduced government attention due to reprioritisation towards disaster recovery.	I: 3 O: 3	The project focuses on building climate-resilient structures, establish early warning systems, and have backup plans to mitigate the impact of extreme weather events on project timelines.
Security concerns: Political and social instability in the field jeopardise the safety of our staff, disrupting operations and hindering planned activities.	I: 3 O: 2	Implementation of strict security protocols and risk assessment measures will be ensured. Also providing security awareness, employ local security expertise, and liaise closely with authorities to ensure staff safety while maintaining operational continuity.
Terrorism threats: Both external and internal threats from terrorism activities in neighbouring Afghanistan pose security risks in Pakistan.	I: 4 O: 1	The Project Management Team will collaborate with security agencies and adopt strict security measures. In addition, conducting risk assessments, establishing emergency response plans, and coordinate with local law enforcement will mitigate and respond effectively to potential threats.

Notes: High = 5, Low = 1; I = impact, O = probability of occurrence

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C. Environmental and Social Risk Management

The project commits to comply with both Adaptation Fund's ESP and Pakistan's national and sub-national environmental regulations. Hence, both Environmental and Social Compliance Plan (Table 10) and ESMP (Annex 3) have been developed. As most of the outputs are categorised as C requiring no E&S management, the compliance and management plans are drawn for the outputs falling under Category B (Outputs 2.2, 3.2, 4.2 and 5.2). Nevertheless, the project team will continue low-level E&S impact monitoring of the entire project for any unexpected impacts and/or chance finds.

C.1. E&S Impact Assessment and Risk Management for Unidentified Sub-Projects

The ESIA of the project activities has been undertaken to ensure that potential impacts are identified, their significance assessed, and appropriate mitigation measures proposed to avoid or minimize such impacts within a fair and visible timeframe, considering the necessary investment. However, the project includes a few activities, termed USPs that are not yet developed enough in terms of scope and geography for effective E&S impact assessment and mitigation planning. These USPs are related mainly to the small scale local level watershed management and recharge activities (under Outputs 2.2, 3.2, 4.2 and 5.2) that may have some E&S impacts, though manageable. Nevertheless, EEs will be responsible for undertaking meticulous mitigation planning and implementing the ESMP under the guidance of RIE. In line with Adaptation Fund (AF) and ICIMOD's ESMS, the following ESIA process will be adhered to regarding these USPs:

- **Screening:** Conducting a high-level analysis to determine whether a full scale ESIA is necessary. This step will help predicting potential impacts and assessing if a detailed ESIA is required.
- **Scoping:** If a full scale ESIA will be needed, the required studies will be defined, identifying data gaps, determining the appropriate assessment scope, and suggesting suitable methodologies.
- **Impact Prediction and Evaluation:** Analysing the impacts identified during scoping to understand their nature, scale, extent and effect involving experts from relevant fields and consultations with local stakeholders, especially vulnerable communities. The significance of each impact will be judged to decide on the mitigation needs.
- **Mitigation:** Proposing measures to eliminate or reduce negative impacts of the USPs.
- **ESMP Implementation and Monitoring:** Developing an ESMP that outlines resources, roles, and responsibilities for managing impacts and implementing the mitigation measures. It will also include a timeline, resource identification, and a communication plan for progress disclosure. The monitoring requirements and indicators to assess mitigation success will also be defined.

A detailed grievance redressal mechanism has also been included in this proposal (Annex 4) to comply with AF's USP guidance. M&E arrangements are in alignment with the Fund's results framework.

C.2. Environmental and Social Compliance Plan

As elaborated in Section II/K and Table 9, the project is mostly in compliance with the ESP. Hence, the E&S Compliance Plan (ESCP), presented in Table 10, proposes measures to comply with the ESP in general and specifically for the project Outputs 2.2, 3.2, 4.2 and 5.2 under E&S Category B. The ESCP is characterised by a meticulous strategy to integrate and uphold the 15 ESP principles of the Adaptation Fund.

Table 10: E&S Compliance Plan

Project Outputs under Category B	Measures to Avoid, Manage or Mitigate Risks
Overall Project	• A firm commitment to compliance with local laws will be maintained, ensuring adherence to all relevant national and local environmental and social regulations, and obtaining necessary Environmental Approvals for the activities under Outputs 2.2, 3.2, 4.2 and 5.2; thus, establishing a robust legal foundation for the project. • The project will develop the IEEs or checklists as required by the respective EPAs in Khyber Pakhtunkhwa and Sindh. • The project will make sure that the beneficiary communities are actively engaged in planning, implementation and monitoring of the activities to ensure ownership and sustainability. • The project will comply with the ESP principles throughout the implementation period and will continuously monitor compliance of all but specifically the triggered ones, reporting regularly and be ready for any course correction required. • An activity-specific ESIA and mitigation planning will be conducted for USPs, as elaborated in Section III/C.1. • The compliance of ESP and implementation ESMP will be particularly evaluated through both Mid-Term Review and Terminal Evaluation.

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Project Outputs under Category B	Measures to Avoid, Manage or Mitigate Risks
Output 2.2: Recharge measures (for improved springshed practices, land use planning, and bioengineering) co-developed and implemented.	• The planned recharge measures include recharge pits and trenches, absorption terraces and small ponds, and vegetative check dams and contour trenches. Though physical in nature, these activities are part of the nature-based solutions; hence do not pose any adverse environmental impact. Nevertheless, implementing ESMP, the project will pay special attention to the compliance of ESP and statutory requirement of KP-EPA. • The water quantity and quality will be regularly monitored for recording success of the interventions and to avoid unwanted results. • The triggered ESP principles 3, 4, 5, 6, 7, 12, 14 and 15 will be fully complied with and reported for compliance, and any chance find issues.
Output 3.2: Climate-smart and resilient water supply infrastructure established in selected sites, along with contextually relevant management structures with adequate capacity for operation and maintenance of the community infrastructure.	• The core objective of the output is to establish a green climate-resilient community water supply infrastructure, encompassing the construction of 100 solar-powered water points and 60 lead line hand pumps across selected sites. However, these activities may pose environmental and social risks which have been pointed out in ESMP and will be mitigated accordingly. • The beneficiary communities will be trained on monitoring the water quality and quantity as well as on circular approach to make efficient use of water resources. • Special attention will be paid to comply with statutory requirement, the requisite IEEs will be submitted to KP-EPA, and checklists to Sindh EPA for getting Environmental Approval. • The triggered ESP principles 3, 4, 5, 6, 7, 12, 14 and 15 will be fully complied with and reported for compliance, and any chance find issues.
Output 4.2: NbS for sewage treatment demonstrated through constructed wetlands along with proper management structures and adequate capacity for operation and maintenance of wetlands.	• The output will result in eight constructed wetlands as NbS for decentralised sewage treatment, ensuring that the upcoming project steadfastly adheres to the highest standards. There are anticipated risks of adverse environmental and social impacts; hence, the ESMP will be strictly implemented, regularly monitored and reported accordingly. • In compliance with statutory requirements, requisite IEEs will be submitted to KP-EPA, and checklists to Sindh EPA for getting Environmental Approval. • The community based monitoring will ensure that there are no residual effects of the constructed wetlands. • The triggered ESP principles 3, 4, 5, 6, 7, 12, 14 and 15 will be fully complied with and reported for compliance, and any chance find issues.
Output 5.2: 15 selected waterways/ponds in Sindh Province restored/rehabilitated, including installation of water quality monitoring systems and establishing and strengthening operation, maintenance, and management structures.	• The primary focus is rehabilitation and restoration of 15 designated waterways and ponds in Sindh Province, accompanied by the prospective installation of automatic water quality monitoring systems. This activity may pose several environmental and social risks which will need to be mitigated; hence, the ESMP will be implemented, monitored and reported accordingly. • The communities will be trained on monitoring quantity and quality of water to avoid any unwanted impacts on human and livestock health. • In compliance with statutory requirements, requisite checklists will be developed and submitted to Sindh EPA for getting Environmental Approval. • The triggered ESP principles 3, 4, 5, 6, 7, 12, 14 and 15 will be fully complied with and reported for compliance, and any chance find issues.

C.3. E&S Management Arrangements

These management arrangements are based on a combination of secondary research and information about specific risks from activities proposed under this project during E&S Screening and ESIA. These arrangements have also benefitted from the community, and local and national government consultations undertaken in the preparation of this proposal and reflect the best practices from other AF supported projects and other agencies working in Pakistan, who implement projects in accordance with their internationally recognised E&S safeguards.

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Principles of access and equity will be emphasised, with a particular focus on the inclusion of vulnerable and marginalised communities in the project's ambit. The specific needs of marginalised groups will be identified and addressed, ensuring their meaningful inclusion in decision-making processes.¶
The entire project lifecycle will be guided by a human rights-centric approach, incorporating regular assessments to identify and mitigate potential risks.¶
The initiative will be framed within the context of gender equality and women empowerment, with a focus on integrating gender-responsive strategies into both planning and execution.¶
A cornerstone of the plan will be the unwavering commitment to core labour rights, emphasising fair wages and safe working conditions for all involved. Indigenous peoples will be accorded due respect, with consultations designed to integrate traditional knowledge seamlessly into the project's fabric.¶
The plan will robustly address involuntary resettlement, striving to minimise displacement and providing comprehensive support if unavoidable.¶
Environmental sustainability will be deemed paramount, with measures in place to protect natural habitats and conserve biological diversity. The project will stand as a bastion against climate change, integrating resilient design features to adapt and mitigate potential impacts.¶
Pollution prevention and resource recovery will form integral components of the plan, emphasising sustainable waste management practices. Public health will be prioritised through measures ensuring the safety of water supply, complemented by health awareness campaigns.¶
Cultural heritage and physical landmarks will be duly acknowledged and safeguarded, minimising impacts during construction.¶
Soil conservation strategies and erosion control measures will be woven into the plan, promoting sustainable land use practices.¶ ... [52]

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¶
The ESIA of the project activities has been established to ensure that potential impacts are identified, their significance asse ... [55]

- **Responsibilities:** Direct responsibility for implementation of the project in accordance with this plan lies with the Project Manager (staff of RIE) who has oversight and compliance responsibility. Any changes or additional activities that arise during the project implementation that add value to or complement proposed sub-projects (within allowable limits set by the Adaptation Fund) will need to be cleared by the Project Manager and approved by the Project Steering Committee. The relevant EE (UNICEF) will be responsible for on-ground implementation, monitoring and reporting on implementation of the ESMP.
- **Management and Implementation of Risk Mitigation Measures:** Mitigation measures, including awareness raising and capacity building related to compliance with the E&S and gender safeguards, will be part of the project activities and budgeted accordingly.
- **Gender:** The gender analysis is presented in of the proposal and measures are highlighted under ESP's Gender Equality and Women's Empowerment principle and GESI considerations integrated across the project.
- **Budget:** As all the proposed mitigation measure to address the E&S risks and impacts are of avoidance and minimising nature, no separate budget will be required to implement the mitigation measures. Adequate budget has already been allocated for implementation of the ESMP, nestled withing the proposed activities under the project Components 2, 3, 4 and 5, and monitoring and reporting on the E&S compliance be part of the regular M&E mechanisms (Section III/G). However, if needed, more budget will be made available through reallocation of activities budget with the approval of the Adaptation Fund.
- **E&S Compliance:** All memorandums of understanding and agreements of cooperation with EEs, and goods and services contracts with the potential contractors, will include reference to and compliance with the 15 principles of the AF ESP and the Gender Policy. The project staff specialised in human rights issues will monitor for compliance with the ESP during the project's implementation. The gender focal point will also check compliance against principle 5 and the Gender Policy during implementation.
- Continued **coordination with focal points** within the national and local governments, responsible for compliance with national and local standards will take place throughout the project.
- **Capacity building and awareness raising:** The Project Manager and his or her team will provide capacity building and awareness raising on compliance with the environmental and social and gender policies to executing entities and target communities so that they are aware of potential risks and are better placed to avoid or mitigate the risks, or recognise the potential risks for them and raise the same through the appropriate channels, including the GRM (Annex 4). This capacity building and awareness raising will be done in the inception phase of the project, prior to the commencement of construction. Furthermore, targeted capacity building activities are implemented as part of the project components throughout the implementation.

C.4. E&S Monitoring and Evaluation Arrangements

- This monitoring arrangements will be used to measure the effectiveness of actions and collate results which will be reported to the Adaptation Fund in annual, mid-term and final (terminal) reports. Monitoring will be undertaken to ensure that E&S management actions are taken in a timely manner and to determine if actions are appropriately mitigating the risk/impact or if they need to be modified to achieve the intended outcome.
- Annual reporting will include information about the status of implementation of the compliance and management plans. The reports shall also include, if necessary and required, a description of any corrective actions that are deemed necessary.
- Direct monitoring responsibilities will be of the Project Manager, who will also have oversight and compliance responsibility. If changes or additional activities are required, monitoring indicators will be modified or added as well, as required.
- Gender-specific and/or disaggregated indicators and targets have been developed as shown in the Results Framework presented at Section III/E.

D. Monitoring and Evaluation Arrangements and Budget

D.1. M&E Oversight and Monitoring Responsibilities

D.1.1. Project Steering Committee (PSC)

The PSC will advise corrective action as needed to ensure the project achieves the desired results. The PSC will hold project reviews to assess the performance of the project and appraise the Annual Work Plan for the following year. In the project's final year, the PSC will hold an end-of-project review to capture lessons learned discuss opportunities for scaling up and highlight project results and lessons learned with relevant audiences. This final review meeting will also discuss the findings outlined in the project terminal evaluation report and the management response.

D.1.2. Project Manager

The Project Manager is responsible for day-to-day project management and regular monitoring of project results and risks, including environmental and social risks, through the dedicated M&E resource. The Project Manager will ensure that all

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Action ... [56]

project staff maintain a high level of transparency, responsibility and accountability in M&E and reporting of project results. The Project Manager will be responsible for informing the PSC of any delays or difficulties as they arise during implementation so that appropriate support and corrective measures can be adopted.

The Project Manager will develop annual M&E work plans based on the project work plan, including annual output targets to support the efficient implementation of the project. The Project Manager will ensure that the standard M&E requirements are fulfilled to the highest quality. This includes, but is not limited to, ensuring the results framework indicators are monitored quarterly in time for evidence-based reporting in the Project Monitoring Report (PMR), and that the monitoring of risks and the various plans/strategies developed to support project implementation occur on a regular basis.

D.1.3. Executing Entities (EEs)

The EEs are responsible for providing all required information and data necessary for timely, comprehensive, and evidence-based project reporting, including results and financial data, as necessary and appropriate.

D.2. M&E Plan and Budget

Table 11 presents the M&E requirement across the project lifespan, responsibilities, and budget for undertaking various M&E activities.

Table 11: M&E Plan and Budget

M&E Requirements	Description	Responsibility	Budget (US$)	Timeframe
Baseline Assessment	An initial evaluation will be conducted at the beginning of the project to establish a reference point for future comparisons. It will involve systematically collecting and analysing data related to key indicators, performance metrics, and contextual factors relevant to the project's objectives. The purpose will be to understand the current conditions, identify existing challenges, and measure the status quo (conflict-risks) before any interventions or initiatives are implemented. This will provide a benchmark against which progress, and the impact of interventions can be measured over time, enabling effective monitoring and evaluation throughout the project lifecycle.	EEs, to be coordinated by PMU	60,000	Inception Phase
	The Baseline Report will be comprehensive document that will capture the initial state or conditions of the project at its outset. It will serve as a foundational reference point, presenting a detailed snapshot of key indicators, metrics, and contextual factors relevant to the project's objectives. The report will include data and insights obtained through a baseline assessment, providing a clear understanding of the starting point before any interventions or activities take place.		0	Inception Phase
Inception	Inception Workshop	EEs, to be coordinated by PMU	40,000	Inception Phase
Impact Monitoring	A systematic tracking of project outcomes over time. It will focus on measuring the intended changes or benefits resulting from the implementation of specific activities. This will involve the collection and analysis of data related to key performance indicators, milestones, and targeted objectives. This ongoing process will allow for informed decision-making, adaptive management, and the refinement of strategies to maximise positive outcomes and achieve the desired impact.	M&E Officer at PMU, through relevant EEs	20,000	Ongoing
E&S Monitoring	Monitoring of E&S risks and mitigative actions will involve a systematic and ongoing process of observing, evaluating, and managing environmental and social impacts associated with the project. This monitoring will ensure compliance with environmental and social standards, regulations, and policies. It will include the continuous tracking of factors and elements that may pose risks to the environment or	M&E Officer at PMU, through relevant EEs	0	Ongoing

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M&E Requirements	Description	Responsibility	Budget (US$)	Timeframe
	communities. The aim is to proactively address and manage E&S risks, fostering sustainable and responsible practices throughout the project's lifecycle.			
Project Monitoring Report	The Project Monitoring Report will be a regular document that provides a snapshot of a project's progress, achievements, and challenges over a three-month period. It will include updates on key performance indicators, activity milestones, and project risks (including E&S risks). The report will also assess project implementation during the quarter and highlight any deviations from the project plan. Data on budget utilisation, resource allocation, and risk management may also be included. The Quarterly Project Monitoring Report will serve as a valuable tool for concerned stakeholders, enabling them to track the project's trajectory and make informed decisions to ensure successful project outcomes.	Prepared by EEs and supervised by M&E Officer at PMU	0	Quarterly
PSC Review Meetings	The project's impact and implementation progress documented in the PMRs will be reviewed in the PSC meetings for effective steering of the project. The PSC will advise on actions based on the M&E review for adaptive management and ensuring that project outcomes and objective is met.	PSC supported by PMU and EEs	100,000	Annually
Action Tracker	The action tracker will document the actions taken by the project management unit in response to the recommendations of the PSC. The action tracker will be updated before subsequent PSC meetings take place.	M&E Officer at PMU, through relevant EEs	20,000	Bi-annually
Gender Assessment	This assessment will aim to understand the differential impacts and experiences of individuals based on their gender identity. It will involve analysing project activities, outputs, and outcomes against the specific results set by the gender action plan of the project and progress against those to identify any disparities, inequalities, or opportunities for promoting gender equality.	GESI Officer at PMU through EEs	40,000	Mid-term and at the end of the project.
	Key elements of the gender assessment will include examining the distribution of project benefits among different genders, assessing the inclusivity of project interventions, and identifying gender-specific challenges or advantages as set by the gender action plan of the project. This will ensure that the project continues to be sensitive to gender dynamics, promotes equitable outcomes, and contributes to positive social change. The findings from the gender assessment will inform project adjustments, improving effectiveness, and fostering a more inclusive and gender-responsive approach for the rest of throughout the project lifecycle.		0	
	The gender assessment will be conducted as part of the mid-term and end-term project review.		0	
Mid-Term External Evaluation and Mid-term Meeting	The Mid-Term Review (MTR) will be a comprehensive assessment conducted at the midpoint of a project's implementation. It will serve as a critical checkpoint to evaluate the project's progress, performance, and effectiveness against its planned objectives and outcomes. The MTR will involve a thorough examination of key project components, including activities, outputs, and outcomes, as well as the identification of challenges and opportunities.	M&E Officer at PMU, supported by EEs	70,000	Project mid-term
	During the Mid-Term Review, independent evaluators will assess the project's relevance, efficiency, and effectiveness,		0	

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M&E Requirements	Description	Responsibility	Budget (US$)	Timeframe
	considering changes in the project environment and adapting strategies accordingly. The review also provides an opportunity to validate the project's theory of change, assess risk management strategies, and make necessary adjustments to ensure successful project completion. The insights gained from the Mid-Term Review contribute to informed decision-making, adaptive management, and the overall success of the project.			
	A management response will be developed that will include actions to address the recommendations from the project's Mid-Term Review. The response will be presented to and approved by the PSC.		0	
	The Mid-Term Review Report will be a comprehensive document that synthesises the findings, insights, and recommendations derived from the Mid-Term Review (MTR) process conducted during a project's implementation. This report will offer a detailed analysis of the project's progress at the midpoint, evaluating its performance against planned objectives and outcomes. It will include an assessment of the project's relevance, efficiency, sustainability, and effectiveness, considering any changes in the project environment. The report will also detail findings from the gender assessment activity.		0	
	The Mid-Term Review Report provides stakeholders with a clear understanding of the project's accomplishments, challenges encountered, and recommendations based on the lessons learned.		0	
	The MTR report will be disseminated to relevant stakeholders through various communication channels including physical and online events.		0	
Terminal Evaluation	The Terminal Evaluation will be a final, comprehensive assessment conducted at the conclusion of the project's implementation. This evaluation will aim to systematically review and analyse the project's overall performance, outcomes, and impacts against the initially defined goals and objectives. The Terminal Evaluation will provide a thorough examination of the project's relevance, efficiency, scalability and replicability, effectiveness, sustainability, and impact on the target beneficiaries or community.	EEs supervised by M&E Officer at PMU	80,000	During the last quarter of the project implementation period.
	Key components of the Terminal Evaluation will include an assessment of project outputs, the achievement of intended outcomes, the sustainability of project benefits, and an analysis of the factors contributing to or hindering success. The evaluation will involve gathering feedback from stakeholders, reviewing project documentation, and conducting field visits to validate findings.		0	
	The Terminal Evaluation will also include the planned gender assessment at the project end-term. A management response will be developed that will include actions to address the recommendations from the TE. The response will be presented to and approved by the PSC.		0	
	The Terminal Evaluation Report will serve as a crucial document summarising the project's entire lifecycle, presenting lessons learned, and providing recommendations for future initiatives. It will serve as an essential tool for project stakeholders, funders, and decision-makers to assess		0	

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M&E Requirements	Description	Responsibility	Budget (US$)	Timeframe
	the overall success of the project and to inform strategic planning for future programming.			
	The TE report will be disseminated to relevant stakeholders through various communication channels including physical and online events.		0	
Final Report	The project's terminal PMR along with the terminal evaluation (TE) report and corresponding management response will serve as the final project report package. The final project report package shall be discussed with the PSC during an end-of-project review meeting to discuss lessons learned and opportunities for scaling up.	M&E Officer at PMU, supported by EEs	0	Due within one month after the end-of-project implementation.
Final Dissemination Workshop	The Final Project Closing Dissemination Workshop	PMU, supported by EEs	50,000	
TOTAL M&E BUDGET			**480,000**	

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E. Results Framework

Table 12: Results Framework

Intended Results	Indicators / Measures	Means of Verification	Baseline Values	Mid-term and Final Targets
Impact: Reduced climate vulnerability and increased adaptive capacity of the population residing in Pakistan's Indus Basin through (1) reduced climate-induced cryosphere multi-hazard risks, (2) resilient land use planning, (3) increased access to groundwater, (4) climate adaptive WASH infrastructure, (5) reduced pollution levels and water-wastage, (6) improved climate adaptive policy practice & community empowerment.	• Percentage decrease in the mortalities due to climate-induced disasters in the targeted area (gender and age disaggregated). • Percentage decrease on economic losses due to climate-induced disasters in the targeted area. • Percentage decrease in the climate displacement and migration (gender and age disaggregated). • Percentage decrease in the incidence of diseases due to the lack of clean water supply and WASH infrastructure (gender and age disaggregated). • Percentage increase in communities with perception of improved living conditions because of adopting climate adaptation practices. • Percentage increase in the participation and leadership of women and young people (under 35-years old) in community-led adaptation activities and governance.	• NDMA reports • Sub-national health statistics • Project terminal MEL report highlighting comparative assessment of project baseline, midline and endline reports.		
Outcome 1: Reduced climate-induced cryosphere multi-hazard risk.	• Percentage increase in people reporting reduced vulnerability to climate-induced cryosphere multi-hazard risk due to forewarning (gender and age disaggregated).	• Project baseline, midline and endline reports.		
Output 1.1: Integrated cryosphere risk mapping through community engagement.	• Number of target communities with gender responsive risk mapping and zoning documents.	• Project monitoring report.	0%.	Mid-term: 60% Final: 100%.
Output 1.2: Community-based monitoring and early warning systems established.	• Number of targeted communities with established CB-MEWS monitoring systems • 33% Percentage increase of women and youth in Community Watch Groups and networks.	• Project monitoring report.	0%	Mid-term: 50% Final: 100%.
Output 1.3: Strengthened resilience to cryosphere-related risks.	• Percentage of community members who report strengthened resilience to cryosphere-related risks (gender and age disaggregated) • Number of targeted communities with disaster response SOPs and CB-MEWS that consider gender-specific risks and procedures.	• Project monitoring report.		Mid-term: All.
Outcome 2: Increased access to spring water in climate adaptive and gender inclusive manner.	• Percentage increase in gender-disaggregated access to safe water from springs (gender and age disaggregated). • Percentage of community members who report sustainable and safe access to spring water (33% of women and youth).	• Project baseline, midline and endline reports.		

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Project terminal MEL report highlighting comparative assessment of project baseline, midline and endline reports

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Percentage decrease on economic losses due to climate-induced disasters in the targeted area.¶
Percentage decrease in the climate displacement and migration.¶
Percentage decrease in the incidence of diseases due to the lack of clean water supply and WASH infrastructure.¶
Percentage increase in communities with perception of improved living conditions because of adopting climate adaptation practices.¶
Percentage increase in the participation and leadership of women in community-led adaptation activities.

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Final: 100%

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Deleted: Percentage of targeted communities with established CB-MEWS monitoring systems.

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Intended Results	Indicators / Measures	Means of Verification	Baseline Values	Mid-term and Final Targets
Output 2.1: A comprehensive web-based information management system of springsheds and springs prepared for Malakand and Hazara divisions.	• Comprehensive web-based database of springsheds and springs in the project areas which considers gender and age-differentiated needs, challenges and solutions of the communities.	• Project monitoring report	None	Mid-term: Database developed
Output 2.2: Recharge measures (for improved springshed practices, land use planning, and bioengineering) co-developed and implemented.	• Percentage increase in quantity and quality of water from identified springs. • Women and youth (50%) have participated and contributed to the co-development and implementation of the recharge measures.	• Project monitoring report		
Output 2.3: Local governance framework for springshed established with enhanced institutional capacity for efficient water resource management.	• Number of target communities with a local governance framework for springshed management. • Number of institutional capacity building interventions carried out in targeted communities that have strengthened gender-transformative approaches to water management and climate change adaptation.	• Project monitoring report	0%	Mid-term: 50% Final: 100%
Outcome 3: Improved climate-resilient management of groundwater and community water supply services in vulnerable areas.	• Community institutions in place (1) that have strengthened capacities for groundwater management and (2) that have women officers (gender and age disaggregated). • Number of people benefiting from access to safe ground water supply sources in target areas (gender and age disaggregated).	• Project baseline, midline and endline reports		
Output 3.1: Groundwater mapping and groundwater recharge facilities completed in selected water-scarce locations in the middle basin, including establishing/ strengthening operation, maintenance, and management structures.	• Comprehensive web-based database of groundwater resource in the project areas that considers the gender and age-differentiated needs and challenges of the communities. • Percentage of identified water recharge facilities completed. • Number of community structures established/strengthened for operation and management of groundwater recharge facilities that have at least 33% of women and youth participation.	• Project monitoring report	None	Mid-term: Database developed Final: 100%
Output 3.2: Climate-smart and resilient water supply infrastructure established in selected sites, along with contextually relevant management structures with adequate capacity for operation and maintenance of the community infrastructure.	• Number of households with access to climate-resilient and sustainably managed water supply services (disaggregated by women-headed households). • Percentage of target water facilities with functional community water management structures. • Percentage (at least 33%) of women participating in community-based groundwater management structures in the target communities (age disaggregated). • Number of solar-powered water facilities constructed/upgraded. • Number of climate-resilient handpumps installed.	• Project monitoring report • Project baseline, midline and endline reports	None None	Mid-term: 40% Final: 100% Final: 100 facilities

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Deleted: Comprehensive web-based database of groundwater resource in the project areas.¶ Percentage of identified water recharge facilities completed.
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Deleted: Number of households with access to climate-resilient and sustainably managed water supply servi ... [57]

Intended Results	Indicators / Measures	Means of Verification	Baseline Values	Mid-term and Final Targets
				Final: 60 handpumps
Outcome 4: WASH infrastructure in the targeted communities in the Middle Indus Basin is more adaptive to climate change-induced shocks with up scaling of the contextually appropriate NbS	• Percentage increase in the volume of wastewater treated through NbS	• Project baseline, midline and endline reports • Project monitoring report		
Output 4.1: Targeted intervention sites identified for evidence-based, climate adaptive and focused WASH interventions.	• Number of intervention sites identified and assessed. • Percentage of women and youth (30%) participated in the assessments and analyses ensuring gender-responsive and transformative WASH interventions	• Project monitoring report	None	Mid-term: All
Output 4.2: NbS for sewage treatment demonstrated through constructed wetlands along with proper management structures and adequate capacity for operation and maintenance of wetlands.	• Number of constructed wetlands with proper management regime for the operation and maintenance developed and maintained. • Percentage (33%) of women participating in management of constructed wetlands (age disaggregated)	• Project monitoring report • Project baseline, midline and endline reports	None	Final: 8 constructed wetlands
Outcome 5: Community and institutional capacity to reduce surface water waste and increase its storage for productive use is increased, allowing communities to adapt to climate-induced shocks.	• Percentage increase in targeted surface water bodies with improved water quality parameters. • Percentage increase in storage capacity of surface water in the project areas. • Number of people benefiting from reduced surface water waste and increased storage for it in target areas (gender and age disaggregated)	• Project monitoring report • Project baseline, midline and endline reports		
Output 5.1: Government of Sindh supported in systematically prioritising 15 natural waterways and community water ponds to address water storage and wastage issues.	• Study report on natural waterways and community ponds that considers the gender- and age differentiate needs and challenges of the communities • Percentage (33%) of women participating in communal pond management committees and management and operations	• Project monitoring report	None	Mid-term: Completed study report
Output 5.2: 15 selected waterways/ponds in Sindh Province restored/rehabilitated, including installation of water quality monitoring systems and establishing and strengthening operation, maintenance, and management structures.	• Number of fully managed climate-resilient water storage structures in the project areas. • Number of community management committees established and strengthened with at least 33% of women and youth participation	• Project baseline, midline and endline reports	None	Final: 15 waterways/ponds
Outcome 6: Improved knowledge and practices of communities and policymakers on climate change adaptation and climate risk reduction.	• Percentage increase (at least 50%) in number of community members aware of climate risks (gender and age disaggregated).	• Project baseline, midline and endline reports • KAP survey report	None	

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Final: 100 facilities¶
Final: 60 handpumps

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Project monitoring report

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Percentage of women participating in management of constructed wetlands.

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Deleted: Percentage increase in targeted surface water bodies with improved water quality parameters.¶
Percentage increase in storage capacity of surface water in the project areas.

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Intended Results	Indicators / Measures	Means of Verification	Baseline Values	Mid-term and Final Targets
	• Number of community members equipped with knowledge on adaptative and gender-transformative management of water resources (gender and age disaggregated). • Percentage of targeted communities where at least 33% of the beneficiaries of capacity and knowledge-building interventions were women. • Percentage increase (at least 33%)of women in coordination platforms, decision-making bodies and different structures related to community level water management. • A robust supportive and inclusive ecosystem with required policies, strategies or regulations related to climate adaptation and water resource management at the provincial and national levels.			
Output 6.1: National and provincial capacities strengthened to apply innovative social and technological tools for establishing and enforcing human-centred and gender-transformative systems of climate change adaptation and accelerating the progress towards management of Indus water resources.	• Number of (at least 6) relevant, local institutions that receive technical training in innovative social and technological tools for climate change adaptation. • Percentage of people trained who report increased capacity and skills on gender-transformative approaches and adaptive capacities (Gender and age disaggregated).	• Project monitoring report		
Output 6.2: National and provincial stakeholders have access to strengthened evidence-based data and knowledge for informed decision-making and implementation of climate adaptation and mitigation that foster collaboration across sectors	• Number of knowledge products accessed and used by policy makers, community leaders and others (guidelines, practical briefs, media articles) relating to climate change and WASH. • Number people participating in spaces and platforms for sharing and exchanging of knowledge on climate adaptation practices (gender and age disaggregated, at least 50% women and youth).	• Project monitoring report	None	
Output 6.3: Youth and women's leadership as well as community-led adaptation solutions strengthened in climate action through awareness raising and behavioural change campaigns	• Number of community members participating in awareness building and behaviour change campaigns to promote the uptake of new adaptation solutions (gender and age disaggregated, at least 50% women and youth). • Number of partners reached through the campaigns and activities that foster social cohesion and understanding of the climate change and its gendered and human security implications	• Project baseline, midline and endline reports • Project monitoring reports	None	
Estimated Budget: US$10,000,000				

Deleted: Percentage increase in number of community members aware of climate risks.¶
Percentage increase in number of community members equipped with knowledge about adaptative management of water resources.¶
Percentage of targeted communities where at least 30 percent of the beneficiaries of capacity and knowledge-building interventions were women.¶
Increase (%) of women in coordination platforms, decision-making bodies and different structures related to community level water management.¶
A robust supportive and inclusive ecosystem with required policies, strategies or regulations related to climate adaptation and water resource management at the provincial and national levels.

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Deleted: Number of relevant, local institutions that receive technical training in innovative social and technological tools for climate change adaptation.

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Deleted: Number of knowledge products being accessed and used by policy makers, community leaders and others (guidelines, practical briefs, media articles) relating to climate change and WASH.

Deleted: Project baseline, midline and endline reports

Deleted: Community-led adaptation solutions widely adopted through awareness-raising and behavioural change.

Deleted: Number of community members participating in awareness building and behaviour change campaigns to promote the uptake of new adaptation solutions.¶
Number of partners reached through the campaigns and activities

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Activity 1.1.1.→Generate hazard maps using advanced Earth Observation and GIS technology to confirm the present level of hazard upstream affecting communities in Ishkoman Valley, Manjawa Valley, Sher Qila valley, Hasaan Abad valley, Shimshal Valley, Bagrot Valley, Reshun Valley, Susoom Valley and Kalash Valley.¶
Activity 1.1.2.→Assess the vulnerability and exposure of communities in the selected sites. Evaluate the vulnerability and exposure of communities residing in the selected areas to understand their susceptibility to potential hazards.¶
Activity 1.1.3.→Conduct participatory community-level risk assessments of the targeted vulnerable communities using an existing method that has been tested in other river basins to identify potentially dangerous glacier lakes based on previous collaborative work with AKAH Pakistan and National Disaster Management Authority's guidelines in the selected site ... [61]

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F. Project Alignment with the Results Framework of the Adaptation Fund

The project has been designed keeping in view the results framework of the Adaptation Fund; hence, the project results are fully aligned with the Fund Outcomes (Table 13) and the Fund Outputs (Table 14).

Table 13: Alignment of Project Results with the Fund Outcomes

Project Objectives	Project Objective Indicator(s)	Fund Outcome	Fund Outcome Indicator	Grant Amount (US$)
Impact: Reduced climate vulnerability and increased adaptive capacity of the population residing in Pakistan's Indus to the impacts of climate change.	• Percentage decrease in the mortalities due to climate-induced disasters in the targeted area (gender and age disaggregated). • Percentage decrease on economic losses due to climate-induced disasters in the targeted area. • Percentage decrease in the climate displacement and migration (gender and age disaggregated). • Percentage decrease in the incidence of diseases due to the lack of clean water supply and WASH infrastructure (gender and age disaggregated). • Percentage increase in communities with perception of improved living conditions because of adopting climate adaptation practices. • Percentage increase in the participation and leadership of women and young people (under 35-years old) in community-led adaptation activities and governance.	1: Reduced exposure to climate-related hazards and threats.	1.1. Relevant threat and hazard information generated and disseminated to stakeholders on a timely basis.	10,000,000
		2: Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses.	2.1. Capacity of staff to respond to, and mitigate impacts of, climate-related events from targeted institutions increased.	
		3: Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level.	3.1. Percentage of targeted population aware of predicted adverse impacts of climate change, and of appropriate responses. 3.2. Percentage of targeted population applying appropriate adaptation responses.	
		4: Increased adaptive capacity within relevant development sector services and infrastructure assets	4.1. Responsiveness of development sector services to evolving needs from changing and variable climate. 4.2. Physical infrastructure improved to withstand climate change and variability-induced stress.	
		5: Increased ecosystem resilience in response to climate change and variability-induced stress.	5.1. Ecosystem services and natural resource assets maintained or improved under climate change and variability-induced stress.	
		7: Improved policies and regulations that promote and enforce resilience measures.	7.1. Climate change priorities are integrated into national development strategy.	
		8: Support the development and diffusion of innovative adaptation practices, tools, and technologies.	8.1. Innovative adaptation practices are rolled out, scaled up, encouraged and/or accelerated at regional, national and/or subnational level.	

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Deleted: 1.1. No. of projects/programmes that conduct and update risk and vulnerability assessments (by sector and scale)¶
1.2 No. of early warning systems (by scale) and no. of beneficiaries covered

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Deleted: Basin through (1) reduced climate-induced cryosphere multi-hazard risks, (2) resilient land use planning, (3) increased access to groundwater, (4) climate adaptive WASH infrastructure, (5) reduced pollution levels and water-wastage, (6) improved climate adaptive policy practice & community empowerment.

Deleted: 7: Improved policies and regulations that promote and enforce resilience measures.

Deleted: 8: Support the development and diffusion of innovative adaptation practices, tools, and technologies.

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Deleted: Percentage decrease in the mortalities due to climate-induced disasters in the targeted area.¶
Percentage decrease on economic losses due to climate-induced disasters in the targeted area.¶
Percentage decrease in the climate displacement and migration.¶
Percentage decrease in the incidence of diseases due to the lack of clean water supply and WASH infrastructure.¶
Percentage increase in communities with perception of improved living conditions because of adopting climate adaptation practices.¶
Percentage increase in the participation and leadership of women in community-led adaptation activities.

Table 14: Alignment of Project Results with the Fund Outputs

Project Outcome(s)	Project Outcome Indicator(s)	Fund Output	Fund Output Indicator	Grant Amount (US$)
1: Reduced climate-induced cryosphere multi-hazard risk (Component 1: Cryosphere DRR)	Percentage increase in people reporting reduced vulnerability to climate-induced cryosphere multi-hazard risk due to forewarning (gender and age disaggregated)	Output 1.1: Risk and vulnerability assessments conducted and updated.	1.1. No. of projects/programmes that conduct and update risk and vulnerability assessments (by sector and scale). 1.2. No. of early warning systems (by scale) and no. of beneficiaries covered	140,773
		Output 1.2: Targeted population groups covered by adequate risk reduction systems	1.2.1. Percentage of target population covered by adequate risk-reduction systems	1,159,598
		Output 3.1: Targeted population groups participating in adaptation and risk reduction awareness activities.	3.1.1. No. of news outlets in the local press and media that have covered the topic.	361,131
		Output 3.2: Strengthened capacity of national and subnational stakeholders and entities to capture and disseminate knowledge and learning	3.2.1. No. of technical committees/associations formed to ensure transfer of knowledge. 3.2.2. No. of tools and guidelines developed (thematic, sectoral, institutional) and shared with relevant stakeholders.	492,714
Outcome 2: Increased access to spring water in climate adaptive and gender inclusive manner (Component 2: Springshed Revival and Management)	• Percentage increase in gender-disaggregated access to safe water from springs (gender and age disaggregated). • Percentage of community members who report sustainable and safe access to spring water (33% of women and youth)	Output 1.2: Targeted population groups covered by adequate risk reduction systems.	1.2.1. Percentage of target population covered by adequate risk-reduction systems.	309,541
		Output 4.1: Vulnerable development sector services and infrastructure assets strengthened in response to climate change impacts, including variability.	4.1.2. No. of physical assets strengthened or constructed to withstand conditions resulting from climate variability and change (by sector and scale).	221,432
		Output 5.1: Vulnerable ecosystem services and natural resource assets strengthened in response to climate change impacts, including variability	5.1.1. No. of natural resource assets created, maintained or improved to withstand conditions resulting from climate variability and change (by type and scale)	626,647
Outcome 3: Improved climate-resilient management of groundwater and community water supply services in vulnerable areas	• Community institutions in place (1) that have strengthened capacities for groundwater management and (2) that have women officers (gender and age disaggregated). • Number of people benefiting from access to safe ground	Output 1.2: Targeted population groups covered by adequate risk reduction systems	1.2.1. Percentage of target population covered by adequate risk-reduction systems	35,939
		Output 4.1: Vulnerable development sector services and infrastructure assets strengthened in response to climate change impacts, including variability.	4.1.2. No. of physical assets strengthened or constructed to withstand conditions resulting from climate variability and change (by sector and scale).	2,271,124

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Project Outcome(s)	Project Outcome Indicator(s)	Fund Output	Fund Output Indicator	Grant Amount (US$)
(Component 3: Groundwater Management and Resilience of Community Water Supply Services)	water supply sources in target areas (50% of women and youth)	Output 5.1: Vulnerable ecosystem services and natural resource assets strengthened in response to climate change impacts, including variability	5.1.1. No. of natural resource assets created, maintained or improved to withstand conditions resulting from climate variability and change (by type and scale)	368,666
Outcome 4: WASH infrastructure in the targeted communities in the Middle Indus Basin is more adaptive to climate change-induced shocks with up scaling of the contextually appropriate NbS (Component 4: Ecosystem-based Solutions)	Percentage increase in the volume of wastewater treated through NbS	Output 1.2: Targeted population groups covered by adequate risk reduction systems	1.2.1. Percentage of target population covered by adequate risk-reduction systems	57,966
		Output 4.1: Vulnerable development sector services and infrastructure assets strengthened in response to climate change impacts, including variability.	4.1.2. No. of physical assets strengthened or constructed to withstand conditions resulting from climate variability and change (by sector and scale).	64,922
		Output 5.1: Vulnerable ecosystem services and natural resource assets strengthened in response to climate change impacts, including variability	5.1.1. No. of natural resource assets created, maintained or improved to withstand conditions resulting from climate variability and change (by type and scale)	688,641
Outcome 5: Community and institutional capacity to reduce surface water waste and increase its storage for productive use is increased, allowing communities to adapt to climate-induced shocks (Component 5: Surface Water Conservation)	• Percentage increase in targeted surface water bodies with improved water quality parameters. • Percentage increase in storage capacity of surface water in the project areas. • Number of people benefiting from reduced surface water waste and increased storage for it in target areas (having 50% of women and youth beneficiaries)	Output 1.2: Targeted population groups covered by adequate risk reduction systems	1.2.1. Percentage of target population covered by adequate risk-reduction systems	34,780
		Output 4.1: Vulnerable development sector services and infrastructure assets strengthened in response to climate change impacts, including variability.	4.1.2. No. of physical assets strengthened or constructed to withstand conditions resulting from climate variability and change (by sector and scale).	906,711
		Output 5.1: Vulnerable ecosystem services and natural resource assets strengthened in response to climate change impacts, including variability	5.1.1. No. of natural resource assets created, maintained or improved to withstand conditions resulting from climate variability and change (by type and scale)	310,584
Outcome 6: Improved knowledge and practices of communities and	• Percentage increase (at least 50%) in number of community members aware of climate risks	Output 3.1: Targeted population groups participating in adaptation and risk reduction awareness activities	3.1.1 No. of news outlets in the local press and media that have covered the topic	630,921

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Percentage of identified water recharge facilities completed.¶
Percentage increased in households with access to climate-resilient and sustainably managed water supply.¶
Percentage increase in community managed water supply structures.¶
Percentage increase in number of women participating in community-based groundwater management.¶
Number of solar-powered water facilities constructed/upgraded.¶ ... [77]

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Project Outcome(s)	Project Outcome Indicator(s)	Fund Output	Fund Output Indicator	Grant Amount (US$)
policymakers on climate change adaptation and climate risk reduction (Component 6: Adaptive capacities and empowered communities)	(gender and age disaggregated%). • Number of community members equipped with knowledge on adaptative and gender-transformative management of water resources (gender and age disaggregated). • Percentage of targeted communities where at least 33% of the beneficiaries of capacity and knowledge-building interventions were women. • Percentage increase (at least 33%)of women in coordination platforms, decision-making bodies and different structures related to community level water management. • A robust supportive and inclusive ecosystem with required policies, strategies or regulations related to climate adaptation and water resource management at the provincial and national levels.	Output 3.2: Strengthened capacity of national and subnational stakeholders and entities to capture and disseminate knowledge and learning.	3.2.1. No. of technical committees/associations formed to ensure transfer of knowledge. 3.2.2. No. of tools and guidelines developed (thematic, sectoral, institutional) and shared with relevant stakeholders.	1,007,329
		Output 7.1: Improved integration of climate-resilience strategies into country development plans.	7.1.1. No. of policies introduced or adjusted to address climate change risks (by sector). 7.1.2. No. of targeted development strategies with incorporated climate change priorities enforced.	148,275
		Output 8.1: Viable innovations are rolled out, scaled up, encouraged and/or accelerated.	8.1.1. No. of innovative adaptation practices, tools and technologies accelerated, scaled-up and/or replicated. 8.1.2. No. of key findings on effective, efficient adaptation practices, products and technologies generated.	162,306
			TOTAL	10,000,000

G. Detailed Budget (in US$)

Table 15: Yearly Budget with Notes

Activity	Description	EE	2025	2026	2027	2028	Total	Budget Notes
Component 1: Cryosphere Disaster Risk Reduction **Outcome 1: Integrated cryosphere risk mapping through community engagement**			**501,008**	**678,029**	**460,046**	**219,076**	**1,858,159**	

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Deleted: Output 6.1: National and provincial capacities strengthened to apply innovative social and technological tools for establishing and enforcing human-centred and gender-transformative systems of climate change adaptation and accelerating the progress towards management of Indus water resources.…

Deleted: Output 3.1: Targeted population groups participating in adaptation and risk reduction awareness activities.¶
Output 3.2: Strengthened capacity of national and subnational stakeholders and entities to capture and disseminate knowledge and learning

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3.2.1 No. of technical committees/associations formed to ensure transfer of knowledge.¶
3.2.2 No. of tools and guidelines developed (thematic, sectoral, institutional) and shared with relevant stakeholders

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Output 8: Viable innovations are rolled out, scaled up, encouraged and/or accelerated

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Output 6.2: An extensive knowledge repository on climate change and WASH practices developed.¶
Output 6.3: Community-led adaptation solutions widely adopted through awareness-raising and behavioural change.

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7.2. No. of targeted development strategies with incorporated climate change priorities enforced.¶
8.1. No. of innovative adaptation practices, tools and technologies accelerated, scaled up and/or replicated.¶
8.2. No. of key findings on effective, efficient adaptation practices, products and technologies generated

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Activity	Description	EE	2025	2026	2027	2028	Total	Budget Notes
Output 1.1: Integrated cryosphere risk mapping through community engagement.			**108,507**	**174,000**	**108,343**	**42,076**	**432,926**	
1.1.1	Generate hazard maps using advanced Earth Observation and GIS technology to confirm the present level of hazard upstream affecting communities in Ishkoman Valley, Manjawa Valley, Sher Qila Valley, Hasaan Abad Valley, Shimshal Valley, Bagrot Valley, Reshun Valley, Susoom Valley and Kalash Valley.	ICIMOD	14,000	25,000	18,125	-	57,125	Assessment Study: Costs cover salary of the subject matter expert like cryosphere specialist, Remote Sensing Specialist, water and climate specialist etc and expert consultations to validate EO data analysis through expert group consultations. Publication and Communication: This budget allocation covers expenses related to publishing and communicating the findings of the assessment study. Costs include salary of the communication office, developing informational materials, organizing dissemination events.
1.1.2	Assess the vulnerability and exposure of communities in the selected sites. Evaluate the vulnerability and exposure of communities residing in the selected areas to understand their susceptibility to potential hazards.	ICIMOD	19,132	18,000	13,093	14,076	64,301	This includes costs for subject matter specialist fees, expenses related to local support for field surveys, meeting with communities and stakeholders, and logistical expenses for organizing meetings. Budget covers consultant fees, field equipment, transportation, community engagement activities, meeting logistics, and other miscellaneous expenses. Additionally, it covers expenses related to publishing and communicating the findings of the assessment. Costs include salary of the communication office, developing informational materials, organizing dissemination events.
1.1.3	Conduct participatory community-level risk assessments of the targeted vulnerable communities using an existing method that has been tested in other river basins to identify potentially dangerous glacier lakes based on previous collaborative work with Aga Khan Agency for Habitat (AKAH) Pakistan and National Disaster Management Authority's guidelines in the selected sites to strengthen their resilience to climate change-induced disasters.	ICIMOD	30,170	50,480	33,550	12,000	126,200	This includes costs for subject matter specialist fees, expenses for meetings to engage with communities, and costs for local communities supporting the activities. Budget covers consultant fees, meeting logistics, community engagement activities, and local support expenses. By leveraging existing collaborative work with partners like Aga Khan Agency for Habitat (AKAH) Pakistan, Mountain and Glacier Protection Organization (MGPO) and National Disaster Management Authority's guidelines, this activity aims to strengthen the resilience of communities to climate change-induced disasters in selected sites across mountain region of Pakistan

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Activity	Description	EE	2025	2026	2027	2028	Total	Budget Notes
1.1.4	Implement participatory community-level risk assessments in collaboration with AKAH Pakistan following National Disaster Management Authority's guidelines and utilising a proven method previously employed in other river basins. Identify potentially hazardous glacier lakes through collective efforts, ensuring the selected communities are better prepared to cope with climate change-induced disasters, based on insights gained from collaborative work.	ICIMOD	45,205	80,520	43,575	16,000	185,300	These costs cover subject matter specialist fees, expenses for meetings and workshops with communities, and logistical support for field activities. Budget covers consultant fees, meeting logistics, community engagement activities, and field equipment.
Output 1.2: Community-based monitoring and early warning systems established.			**266,845**	**349,029**	**230,359**	**154,000**	**1,000,233**	
1.2.1	Establish Community Watch Groups to undertake necessary preparedness actions and measures.	ICIMOD	30,600	33,400	22,000	10,000	96,000	This includes costs for workshops/training to implement preparedness guidelines, subject matter expert fees along with local partners/consultation firms (AKAH/MGPO/PDMA/others), and expenses for locals to participate and implement the guidelines. Budget covers workshop/training costs, consultant fees, meeting logistics, community engagement activities, and local support expenses.
1.2.2	Prepare a participatory community monitoring plan, including the need for contextually appropriate technological measures that supplement community members' monitoring.	ICIMOD	24,350	30,400	18,250	18,000	91,000	This includes costs for subject matter specialist fees and fees for local authorities to prepare the participatory plan. Additionally, expenses for the installation of sensors, cameras, and the use of a hazards observation mobile app are covered. Budget includes consultant fees, equipment procurement, training costs, and community engagement activities. By integrating community expertise with technological solutions, this activity aims to enhance community resilience by establishing effective monitoring systems for climate-induced cryosphere multi-hazard risks. Additionally, it covers expenses related to publishing and communicating the manuals and

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Activity	Description	EE	2025	2026	2027	2028	Total	Budget Notes
								guides. Costs include salary of the communication office, developing informational materials, organizing dissemination events.
1.2.3	Co-design and establish a gender-responsive CB-MEWS[23] based on Output 1.1 for hazards such as permafrost-triggered GLOF, glacial floods, landslides, rainfall-induced floods, and avalanches.	ICIMOD	45,000	90,500	57,000	38,000	230,500	This cover costs for establishing a gender team to act in times of hazard events and maintain the CB-MEWS, as well as expenses for training/workshops to train the gender team. Additionally, budget covers costs for subject matter expert, travel, DSA, and partners (PDMA/NDMA/AKAH/others) supporting the activity. Furthermore, expenses for hazards-related response to ensure the safety of women, elderly people, children, and disabled people are included. Budget covers team establishment, training, consultancy fees, travel expenses, workshop logistics, and community engagement activities.
1.2.4	Deploy the identified technology to enhance monitoring and increase warning time.	ICIMOD	20,455	29,000	23,250	10,000	82,705	This covers costs for ICIMOD staff, travel, and DSA to prepare evacuation plans with partners, including Disaster Management Authorities. Budget covers staff salaries, travel expenses, daily subsistence allowances, and workshop logistics for consultation and collaboration with partners.
1.2.5	Prepare evacuation plans in response to potential cryosphere-related hazards and establish evacuation routes and shelter zones cooperating with the respective Disaster Management Agencies.	ICIMOD	24,525	28,600	20,375	18,000	91,500	This includes costs for subject matter specialists , travel, and DSA to prepare evacuation plans with partners, including Disaster Management Authorities. Additionally, budget covers expenses for establishing shelter zones and evacuation routes jointly with local administrative agencies and disaster management authorities. Budget encompasses staff salaries, travel expenses, daily subsistence allowances, and infrastructure development costs for shelter zones and evacuation routes. Additionally, it covers expenses related to publishing and communicating the evacuation plans. Costs include salary of the communication office, developing informational materials, organizing dissemination events.
1.2.6	Establish networking and communication channels to disseminate early warning	ICIMOD	23,390	26,529	20,109	12,000	82,028	This includes costs for communication and networking channels for the early warning system, encompassing equipment procurement,

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Activity	Description	EE	2025	2026	2027	2028	Total	Budget Notes
	information in a larger network to provide lead time for preparedness.							installation, and maintenance. Additionally, budget covers expenses for early warning system installation, including infrastructure setup, equipment installation, and testing. Budget encompasses equipment costs, installation fees, training expenses, and ongoing maintenance costs.
1.2.7	Combine CB-MEWS with real-time satellite data for timely risk identification and communication. Integrating CB-MEWS with real-time satellite data enhances the accuracy and timeliness of hazard identification and communication.	ICIMOD	15,025	19,600	10,875	11,000	56,500	This includes costs for the development of an integrated mobile app for the acquisition of satellite and ground data in near real-time. Additionally, budget covers expenses for engaging with local communities to ensure they have access to the integrated data, including training sessions, community workshops, and outreach activities. Budget encompasses app development costs, training expenses, community engagement activities, and ongoing support.
1.2.8	Build community capacity to understand and respond to potential hazards (using existing Community-Based Disaster Risk Management committees - CBDRMs) and community-based hazard monitoring and risk resilience in cooperation with the respective Disaster Management Agencies.	ICIMOD	44,300	50,200	34,500	19,000	148,000	This includes costs for capacity-building workshops to raise community awareness and provide training to understand and reduce hazard risks. Additionally, budget covers expenses for professional staff travel, daily subsistence allowances (DSA), and costs of local partners contributing to capacity-building activities, including workshop facilitation and materials. Budget cover workshop costs, training materials, travel expenses, and consultant fees. Additionally, it covers expenses related to publishing and communicating the findings of the training materials. Costs include salary of the communication office, developing informational materials, organizing dissemination events.
1.2.9	Integrate long-term sustainability of the CB-MEWS through creating DRR basket funds and including the CB-MEWS approach in the DRR plan of local government, and respective Disaster Management Agencies. Ensuring the long-term effectiveness of the CB-MEWS involves strategic planning and	ICIMOD	39,200	40,800	24,000	18,000	122,000	This includes costs for workshops to invite stakeholders to participate in developing DRR basket funds, covering facilitation and professional staff costs. Additionally, budget covers expenses for meetings with disaster management agencies to integrate the CB-MEWS approach into their long-term plans, including travel, accommodation, and meeting logistics. Budget encompasses workshop costs, meeting expenses, consultant fees, and stakeholder engagement activities.

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Activity	Description	EE	2025	2026	2027	2028	Total	Budget Notes
	integration into broader disaster risk reduction efforts.							
Output 1.3: Strengthened resilience to cryosphere-related risks.			**125,656**	**155,000**	**121,344**	**23,000**	**425,000**	
1.3.1	Engage local leaders and policymakers to incorporate cryosphere-related risk in flood zonation and infrastructure planning.	ICIMOD	65,000	75,000	50,000	10,000	200,000	This includes costs for subject matter specialist, workshops, meetings, and consultations with local leaders and policymakers. Expenses cover venue rental, facilitation, travel, and accommodation for participants. Budget covers consultancy fee, workshop logistics, stakeholder engagement activities, and consultant fees.
1.3.2	Leverage the evidence on emerging hazards to formulate recommendations on disaster response standard operating procedures and advocate for their implementation with local authorities.	ICIMOD	60,656	80,000	71,344	13,000	225,000	This includes costs for professional staff to assess the latest hazards and support the development of guidelines based on emerging hazards. Additionally, budget covers expenses for consultants to develop updated SOPs for disaster response in mountain environments. Furthermore, budget encompasses costs for local and national consultations with local stakeholders and disaster management authorities to develop guidelines. Budget includes subject matter expert salaries, consultant fees, meeting expenses, travel costs, and workshop logistics. Additionally, it covers expenses related to publishing and communicating the policy briefs. Costs include salary of the communication office, developing informational materials, organizing dissemination events.
Component 2: Springshed Revival and Management **Outcome 2: Increased access to spring water in climate adaptive and gender-inclusive manner**			**307,110**	**369,070**	**278,346**	**44,000**	**998,526**	
Output 2.1: A comprehensive web-based information management system of springsheds and springs prepared for Malakand and Hazara divisions.			**85,165**	**104,745**	**73,090**	**4,000**	**267,000**	
2.1.1	Compile Springs Inventory and a web-based information system (GPS location,	ICIMOD	20,000	25,000	21,927	-	66,927	Training of local water conservation professionals: The budget allocation for this activity includes expenses related to organizing

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Activity	Description	EE	2025	2026	2027	2028	Total	Budget Notes
	biophysical characters, gender-social and economic information).							training sessions for district/tehsil staff of the Soil and Water Conservation. This training will focus on equipping officers with the necessary skills and knowledge to conduct springs survey and data compilation effectively. Costs will cover venue rental, training materials, facilitators' fees, and participant allowances. Training sessions will be tailored to the specific needs of district officers and will ensure comprehensive understanding and proficiency in survey methodologies and data management techniques. District-level Field Survey: Funds allocated for this component will support the implementation of district-level field surveys in the targeted districts. Expenses will cover transportation, field equipment, data collection tools, and field personnel costs. The survey will involve field visits to identified spring sites to gather GPS location data, assess biophysical characteristics, and collect gender-social and economic information. The budget ensures sufficient resources for thorough data collection and validation, ensuring the accuracy and reliability of the compiled springs inventory. Establishment of Information System: This budget allocation covers the establishment of a web-based information system through the specialized services of an information system company. Costs will include software development, database setup, website hosting, and technical support. The information system will integrate GPS location data, biophysical characteristics, and socio-economic information collected during the field survey.
2.1.2	Identify critical springs and climate impacts: (1) Assessing water discharge and contribution to rural and municipal water for life and livelihoods; and (2) Climate change impact assessment on the identified vital/crucial springs.	ICIMOD	14,000	21,272	14,618	4,000	53,890	Assessment Study: Costs cover salary of the subject matter expert like climate change specialist, water and climate specialist etc and expert consultations to evaluate the springs' importance and their vulnerability to climate change impacts. Publication and Communication: This budget allocation covers expenses related to publishing and communicating the findings of the

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Activity	Description	EE	2025	2026	2027	2028	Total	Budget Notes
								assessment study. Costs include salary of the communication office, developing informational materials, organizing dissemination events. The publication and communication efforts aim to raise awareness, foster dialogue, and promote the adoption of adaptive measures to address climate change impacts on vital springs.
2.1.3	Prepare participatory hydrogeological maps: (1) Study of rocks, rock structures, and streams; (2) Geological cross-sections.	ICIMOD	51,165	58,473	36,545	-	146,183	
Output 2.2: Recharge measures (for improved springshed practices, land use planning, and bioengineering) co-developed and implemented.			**173,945**	**189,861**	**155,720**	**21,000**	**540,526**	
2.2.1	Co-design recharge solutions based on participatory approach supported by science and evidence collected through Output 2.1.	ICIMOD	91,022	85,000	55,000	-	231,022	Field Technical Assistance: Allocation for on-the-ground technical support to facilitate participatory co-design of recharge solutions based on scientific evidence. This includes hiring field experts, facilitating community engagement, and coordinating field surveys to gather necessary data. Equipment Procurement: Funds designated for purchasing equipment essential for field surveys and data collection in spring areas. This includes equipment such as GPS devices, water quality testing kits, and measurement tools necessary for assessing recharge solutions. Expert Advisory: Budget provision for providing technical guidance and support to relevant staff for integrating Nature-based Solutions (NbS) into springshed management practices. This includes capacity-building workshops, expert consultations, and knowledge-sharing sessions.
2.2.2	Support the local monitoring of spring revival and groundwater recharge activities.	ICIMOD	26,616	30,216	22,414	7,000	86,246	This includes providing resources for training local community members in monitoring techniques, supplying monitoring equipment, and establishing communication channels for data reporting. These efforts ensure active community involvement in project activities, enhance project transparency, and facilitate

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Activity	Description	EE	2025	2026	2027	2028	Total	Budget Notes
								adaptive management based on real-time data insights.
2.2.3	Install Data Monitoring Systems in select pilot communities to collect long-term spring discharge data, groundwater levels, water quality information, and rainfall data in a participative manner.	ICIMOD	32,000	43,438	30,508	8,000	113,946	This covers the procurement of monitoring equipment, installation costs, and capacity-building for community members to participate in data collection. This participatory approach ensures the sustainability of the monitoring systems, fosters community engagement, and provides essential data for informed decision-making in spring management.
2.2.4	Promote community-led springs management (e.g., Springs User Groups) and deliver the springshed management and monitoring training to community members in the selected communities for operations, maintenance and equitable benefit sharing in a gender-inclusive manner.	ICIMOD	24,307	31,207	16,505	6,000	78,019	This covers the costs for organizing training sessions, developing training materials, and facilitating community engagement. The training will focus on operations, maintenance, and equitable benefit sharing, ensuring gender-inclusive participation.
Output 2.3: Local governance framework for springshed established with enhanced institutional capacity for efficient water resource management.			**48,000**	**74,464**	**49,536**	**19,000**	**191,000**	
2.3.1	Document cost-benefit analysis and impact assessment.	ICIMOD	9,000	14,732	10,457	4,000	38,189	This includes hiring subject matter specialists, conducting field data collection, and facilitating community engagement. Costs cover consultant fees, data collection tools, travel expenses, and community outreach materials. Through rigorous analysis and stakeholder involvement, this activity will provide valuable insights into the effectiveness and socio-economic impacts of springshed management interventions, informing future decision-making and project scalability.
2.3.2	Co-develop guidelines and protocols for local-level management and operations to support responsible and sustainable use of spring water resources.	ICIMOD	9,000	14,732	9,079	4,000	36,811	This includes expenses related to subject matter specialists' cost, stakeholder consultations, expert consultations, drafting, and review processes. Costs cover facilitation fees, meeting logistics, documentation, and dissemination activities.

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Activity	Description	EE	2025	2026	2027	2028	Total	Budget Notes
2.3.3	Strengthen policy, regulation, and governance.	ICIMOD	30,000	45,000	30,000	11,000	116,000	This includes costs associated with policy analysis, stakeholder consultations, capacity-building workshops, and advocacy efforts. Expenses cover consultant fees, venue rental, materials, and travel costs.
Component 3: Groundwater Management and Resilient Community Water Supply **Outcome 3: Improved climate-resilient management of groundwater and community water supply services in vulnerable areas**			**612,000**	**1,130,000**	**566,000**	**-**	**2,308,000**	
Output 3.1: Groundwater mapping and groundwater recharge facilities completed in selected water-scarce locations in the Middle Basin, including establishing/ strengthening operation, maintenance and management structures.			**72,000**	**165,000**	**107,000**	**-**	**344,000**	
3.1.1	Conduct comprehensive groundwater study and mapping in Swat district of Khyber Pakhtunkhwa province	UNICEF	12,000	-	-	-	12,000	This cost includes the consultant fee to develop a comprehensive groundwater mapping for district Swat in consultation with the govt stakeholders.
3.1.2	Conduct a feasibility study and identify 6 sites for the construction of groundwater recharge facilities.	UNICEF	6,000	-	-	-	6,000	This includes the engineering staff fee for conducting detailed feasibility assessment of all the 06 identified sites along with detail designs, Bill of Quantities BoQs and engineering estimates.
3.1.3	Construct ditches and trenches designed to suit the topographic and geological conditions of selected sites to increase the volume of runoff recharging the groundwater.	UNICEF	50,000	150,000	100,000	-	300,000	This includes the vendors payments for construction services and monitoring cost for the engineering team.
3.1.4	Install water quality meters will ensure avoiding maladaptation of contaminating the groundwater.	UNICEF	-	8,000	-	-	8,000	The cost includes procurement and installation of water quality meters for groundwater recharge system.
3.1.5	Establish and train community-based structures for the	UNICEF	1,000	3,000	3,000	-	7,000	The cost includes professional staff fee for establishing WASH committees in the selected

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Activity	Description	EE	2025	2026	2027	2028	Total	Budget Notes
	operation and maintenance of the facilities.							beneficiaries area and providing one day training to the communities and providing equipment for O&M.
3.1.6	Develop technical training courses for technicians and operators of Sindh and KP Local Government Academies (LGAs), along with technical backstopping with the collaboration of academia.	UNICEF	3,000	4,000	4,000	-	11,000	The cost includes professional fee of the local academia for development of training courses for the technicians and operators and providing back stop mechanism for ensuring long term sustainability of the services.
Output 3.2: Green climate-resilient community, water supply Infrastructure, constructed in selected sites with solar-powered pumps and hand pumps, including establishing/strengthening operation, maintenance, and management structures.			**540,000**	**965,000**	**459,000**	**-**	**1,964,000**	
3.2.1	Conduct an assessment of flood-affected community water supply systems in six flood-affected districts of Sindh province and identify vulnerable locations not covered by other interventions.	UNICEF	10,000	-	-	-	10,000	This includes the engineering staff fee for conducting detailed feasibility assessment of all identified sites along with detail designs, Bill of Quantities (BoQs) and engineering estimates.
3.2.2	Construct/upgrade 100 solar-powered water facilities benefiting 150,000 people in Mirpurkhas, Umerkot, Sujawal, Badin, Khairpur and Sukkur districts of Sindh and Charsadda, Swat and Nowshera districts of KP province.	UNICEF	500,000	900,000	424,000	-	1,824,000	This includes vendors payments for construction services for all the selected sites and monitoring cost for the engineering team.
3.2.3	Construct climate-resilient 60 handpumps together with lead pipelines benefiting 15,000 people in Mirpurkhas, Umerkot, Sujawal, Badin, Khairpur and Sukkur districts of Sindh to build back better approach in flood-affected areas.	UNICEF	30,000	60,000	30,000	-	120,000	This includes vendors payments for construction services for all the selected sites and monitoring cost for the engineering team.

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Activity	Description	EE	2025	2026	2027	2028	Total	Budget Notes
3.2.4	Establish/strengthen community water management structures, including training WASH committees and local technicians.	UNICEF	-	5,000	5,000	-	10,000	The cost includes professional staff fee for establishing WASH committees in the selected beneficiaries area and providing one day training to the communities and providing equipment for O&M.
Component 4: Ecosystem-Based Adaptation **Outcome 4: WASH infrastructure in the targeted communities in the Middle Indus Basin is more adaptive to climate change-induced shocks with up scaling of the contextually appropriate NbS**			**91,000**	**394,000**	**210,000**	**5,000**	**700,000**	
Output 4.1: Climate change and WASH data analysis completed in select urban and semi urban areas in the Middle Indus Basin, including targeted impact forecasts under RCP 4.5 and 8.5 to select intervention sites, including site-specific feasibility studies and environmental and social impact assessments.			**31,000**	**19,000**	**-**	**-**	**50,000**	
4.1.1	Conduct secondary WASH, environment and climate change data analysis for target locations	UNICEF	7,000	-	-	-	7,000	This includes procurement fee and professional fee for conducting secondary data analysis of the target sites.
4.1.2	Undertake site-specific environmental and feasibility assessments while ensuring the contextual appropriateness of the intervention at eight selected sites in Charsadda, Swat and Nowshera districts of KP province and Sukkur and Khairpur districts of Sindh province sit, including vegetation selection.	UNICEF	24,000	19,000	-	-	43,000	This includes the professional staff fee for conducting detailed social and environmental feasibilities for all the sites including detail assessment with detail designs, drawings, Bill of Quantities (BoQs) and engineering estimates.
Output 4.2: Eight (8) Constructed wetlands as an NBS for sewage treatment installed decentralized, including establishing and strengthening operation,			**60,000**	**375,000**	**210,000**	**5,000**	**650,000**	

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Activity	Description	EE	2025	2026	2027	2028	Total	Budget Notes
maintenance, and management structures.								
4.2.1	Install constructed wetlands in eight selected sites benefiting 22,400 people in the Charsadda, Swat and Nowshera districts of KP province and Sukkur and Khairpur districts of Sindh province based on proven UNICEF methodology, reducing urban effluent and increasing water availability.	UNICEF	60,000	350,000	184,000	-	594,000	This includes vendors payments for construction services for all the selected sites and monitoring cost for the engineering team for quality assurance.
4.2.2	Strengthen existing government and community structures to operate and maintain the wetlands.	UNICEF	-	10,000	13,000	-	23,000	This includes the cost of professional staff from academia to develop training modules and conduct trainings for govt staff and communities WASH committee on O&M of wetlands. This also include professional's cost for establishing WASH committees along with provision of O&M kits.
4.2.3	Provide technical support, innovative and lateral learning platform, and equipment to service providers unable to operate Sewage Treatment Plants (STPs).	UNICEF	-	15,000	13,000	5,000	33,000	This includes the cost of professional staff from academia to provide technical backing to govt staff and communities WASH committee and equipping them with state of the art solutions and equipment to ensure the long term sustainability of the wetlands.
Component 5: Surface Water Conservation **Outcome 5: Community and institutional capacity to reduce surface water waste and increase its storage for productive use is increased, allowing communities to adapt to climate-induced shocks**			**237,000**	**610,000**	**221,000**	**12,000**	**1,080,000**	
Output 5.1: Comprehensive study on natural waterways, called Dhoras, and community ponds co-developed with the government in Sindh, resulting in the prioritization of 15 intervention sites.			**37,000**	**-**	**-**	**-**	**37,000**	
5.1.1	Undertake local ground-truthing of catchment feasibility	UNICEF	22,000	-	-	-	22,000	This includes the professional cost and engineering team for conducting detail

Activity	Description	EE	2025	2026	2027	2028	Total	Budget Notes
	studies and designing, construction/upgrading of ponds, including lining, silt traps, water filtration units, and water collection points with hand/and solar pumps.							environmental and social feasibilities of all the identified sites.
5.1.2	Detailed designs and BOQs for 15 community pond sites, including site plans.	UNICEF	15,000	-	-	-	15,000	This includes the engineering staff fee for conducting detailed assessment of all identified sites along with detail designs, Bill of Quantities (BoQs) and engineering estimates.
Output 5.2: Comprehensive study on natural waterways, called Dhoras, and community ponds co-developed with the government in Sindh, resulting in the prioritization of 15 intervention sites.			**200,000**	**610,000**	**221,000**	**12,000**	**1,043,000**	
5.2.1	Restore/rehabilitate selected natural waterways in the Sujawal, Umerkot, Sanghar, and Tharparkar districts of Sindh sites	UNICEF	50,000	150,000	44,000	-	244,000	This includes vendors payments for construction services for all the selected sites and monitoring cost for the engineering team for quality assurance.
5.2.2	Install automatic water quality monitoring systems to ensure real-time monitoring in the target catchment location.	UNICEF	-	-	23,900	-	23,900	The cost includes procurement and installation of water quality meters for the catchment population benefited from Doras and ponds.
5.2.3	Construct/upgrade 15 communal ponds benefiting 30,000 people in the Umerkot, Sanghar, Sujawal and Tharparkar districts of Sindh province.	UNICEF	150,000	450,000	145,100	-	745,100	This includes vendors payments for construction services for all the selected sites and monitoring cost for the engineering team for quality assurance.
5.2.4	Establish communal pond management committees will be implemented as a pilot project to promote climate adaptation by communities to ensure water supply during drought which is becoming more and more unpredictable due to ongoing climate change.	UNICEF	-	10,000	8,000	12,000	30,000	Professional staff cost for establishing WASH committees in the all the beneficiary villages and conducting trainings of these committees on climate adaptation practices during adverse climate conditions.

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Activity	Description	EE	2025	2026	2027	2028	Total	Budget Notes
Component 6: Adaptive capacities and empowered communities for strengthened resilience to climate change **Outcome 6: Adaptive Capacities and Empowered Communities for Strengthened Resilience to Climate Change**			**500,952**	**627,914**	**392,134**	**160,000**	**1,681,000**	
Output 6.1: National and provincial capacities strengthened to apply innovative social and technological tools for establishing and enforcing human-centred and gender-transformative systems of climate change adaptation and accelerating the progress towards management of Indus water resources.			**123,464**	**114,726**	**100,810**	**11,000**	**350,000**	
6.1.1	Identify and mobilise core group of partners (change leaders) including relevant government departments from national and provincial levels and citizens, especially young experts and women, to establish sense of urgency and support for testing and applying new adaptation social innovation approaches and tools for climate change mitigation and adaptation that will serve as transformational measures towards meaningfully inclusive and conflict-sensitive approach.	UN Women	42,464	24,464	23,467	-	90,395	Partial costs of professional fees of gender and social cohesion officer to facilitate the identification and mobilization of the core group, and to coordinate the application of the approaches across the programme components providing technical support + fees of workshop costs and travel.
6.1.2	Conduct series of workshops to provide the core group of partners with understanding of and skills on applying new social technologies and inclusive and human-centred approaches so that the core group can lead the testing of new approaches to	UN Women	30,000	20,000	10,000	-	60,000	Costs of consulting firm fee to facilitate take-up of skills and capacities of new approaches and lead/support the testing + fees of workshops costs and travels.

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Activity	Description	EE	2025	2026	2027	2028	Total	Budget Notes
	groundwater policies and regulations in Sindh and KP provinces.							
6.1.3	Support the core group of partners to conduct gap analysis of groundwater legislation at the provincial and federal levels that include an analysis of gender sensitivity and climate security stressors considerations of the current policies and regulations and that includes recommendations for tangible actions for drafting new groundwater acts in KP and Sindh provinces.	UNICEF	20,000	34,054	33,843	5,000	92,897	The cost includes consulting firm fee to for providing services to conduct the gap analysis on groundwater legislation for federal, KP and Sindh and supporting govt on drafting groundwater Acts and support institutional framework for implementation.
6.1.4	Support the core group of partners in co-development of participatory and gender-responsive water management adaptation plans with target communities that foster constructive resilience of communities and individuals and address climate security stressors.	UN Women	21,000	11,000	3,000	-	35,000	Partial costs of professional fees of gender and social cohesion consultant to facilitate and to support technical support to the core group of partners + costs of workshops of co-creation process + consultations of local representatives of the communities including venue and travels in various locations.
6.1.5	Identify and document the lessons learned from the testing process and support the core group of partners to showcase the results to water sector stakeholders in Sindh and KP provinces and national partners, especially the government departments from different provincial/area governments, that supports enhanced coordination amongst different stakeholders.	UN Women	10,000	13,208	17,500	6,000	46,708	Costs of consulting company for designing of KM products/campaigns + costs of conferences / workshops, facilitation, and travels of advocacy events + Partial costs of professional fee of gender and social cohesion officer for capturing the lessons learned throughout the testing process.
6.1.6	Facilitate improved knowledge and practices of policy makers	UNICEF	-	12,000	13,000	-	25,000	The cost includes professional fee of the consultant for conducting trainings of the

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Activity	Description	EE	2025	2026	2027	2028	Total	Budget Notes
	on WASH and climate change through training and institutional support.							decision makers on knowledge and practices and the training cost including venue, food charges, hall booking, DSA and traveling cost of the participants.
Output 6.2: National and provincial stakeholders have access to strengthened evidence-based data and knowledge for informed decision-making and implementation of climate adaptation and mitigation that foster collaboration across sectors			**198,453**	**225,153**	**116,394**	**60,000**	**600,000**	
6.2.1	Undertake district-level training sessions in 15 districts of the proposed project in Sindh, KP and GB provinces to train the district government staff in data collection and data entry in Clean Green Pakistan Index (CGPI) web portals.	UNICEF	80,000	120,000	70,000	30,000	300,000	The cost includes professional fee of the consultant for conducting trainings of the decision makers on knowledge and practices and the training cost including venue, food charges, hall booking, DSA and traveling cost of the participants. The cost also includes cost of data entry operators and IT staff on data entry on CGPI web portal.
6.2.2	Conduct a participatory review of potential adaptation measures (adaptation, coping and recovery) of communities in GB, KP and Sindh (nature-based solutions (NbS) and ecosystem-based solutions (EbAs) across all the project components), especially identifying community adaptation solutions of youth and women that can be replicable in other contexts.	UN Women	33,453	15,153	11,053	-	59,659	The cost of consultant for participatory review and identification of community adaptation solutions + partial professional fees of gender and social cohesion officer to provide GEWE capacity building support to young women and women in identification of their solutions and practices + costs of consultation events and travels.
6.2.3	Create a comprehensive database of all climate-adaptive NbS and EbAs technologies used in the Indus Basin, their cost, efficacy, and contextual prerequisites.	UNICEF	20,000	30,000	20,000	10,000	80,000	The cost includes consultant fee to support govt for development of comprehensive database for all climate adaptive NbS and EbA technologies for Indus Basin.
6.2.4	Provide a series of workshops to identify gender, human security and resilience, and climate data gaps as well as	UN Women	30,000	15,000	-	-	45,000	Consultation/workshop costs including facilitation, venue and travel + partial professional costs of gender and social cohesion officer to provide technical support on human

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Activity	Description	EE	2025	2026	2027	2028	Total	Budget Notes
	co-design and implement processes to capture gender disaggregated data in all relevant sectors including exchange visits between provinces to enhance understanding of gender responsive indicators and monitoring on progress on implementation the indicators.							security and resilience and co-designing of measures for sustainable data collection of gender-indicators (expected to be done in coordination and support with the 6.2.5 consultant on data collection).
6.2.5	Development of National Indus Water Atlas web portal with GIS modelling and geotagging.	UNICEF	35,000	45,000	15,341	20,000	115,341	The cost includes professional fee and stakeholders consultation for data collections and inputs into the web portal with GIS modelling and geo tagging.
Output 6.3: Youth and women's leadership as well as community-led adaptation solutions strengthened in climate action through awareness-raising and behavioural change campaigns.			**179,035**	**288,035**	**174,930**	**89,000**	**731,000**	
6.3.1	Establish District Youth Forums for climate Adaptation and action in Hunza, Gilgit, Swat, Nowshera, Peshawar, Sukkur, Khairpur, Sanghar and Karachi districts for developing institutional linkages and using the digital platform to disseminate public messages on climate change adaptation issues.	UNICEF	70,000	55,000	73,000	20,000	218,000	The cost includes capacity building training sessions for youth from districts. This includes consultant professional fee for conducting these training as well as organizing the event including hall charges, food/ refreshment charges, stationary charges, travel allowance, banners, standees, miscellaneous printing charges etc. for all these training. The budget also includes cost of international travel of finalist of Finale to attend the COP event.
6.3.2	Establish local level women's groups in Hunza, Gilgit, Swat, Nowshera, Peshawar, Sukkur, Khairpur, Sanghar and Karachi to advocate for the priorities of women with respect to water resources management and include their members in advocacy as well as in local decision making towards securing women's voices and presentation in community	UN Women	26,053	27,053	17,053	-	70,159	The cost of consultant professional fee for conducting events for mobilization of the women at the local communities + costs of capacity building workshops to support and mentor the women for their participation and leadership + fees of events and workshops including venue and travels

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Activity	Description	EE	2025	2026	2027	2028	Total	Budget Notes
	level structures including but not limited to water users groups.							
6.3.3	Wherever possible support Public-Private Partnerships (PPPs) with private sector actors in the operation and maintenance and management of WASH facilities constructed by the project.	UNICEF	-	30,000	7,000	3,000	40,000	The cost includes consultant fee to support govt for the development of bankable projects on PPP model for different NbS for further replication of similar models in Pakistan.
6.3.4	Co-develop series of knowledge products that include One Catalogue of appropriate technologies and NbS of water sector stakeholders with geographical presence and capacities for partnership in the Indus Basin ; four technical papers on specific activities of the project for replication in other context in Pakistan and in the region; and six success stories/case studies of the project results.	UNICEF	10,000	35,000	10,000	13,000	68,000	The cost includes professional consultant fee for development of technical papers, case studies, success stories, and development of the catalogue for appropriate technologies for various NbS. The cost also includes the stakeholders consultations including workshops and stakeholder meeting by the consultant firm.
6.3.5	Co-develop promotional media and social media materials of the success stories/case studies of the young women's and women adaptation measures to raise public awareness on communities' and women's unique knowledge that play pivotal roles in climate adaptation and promoting their participation and leadership in addressing human security stressors and social cohesion in climate adaptation including establishing partnership with media houses and universities across the basin and with youth and women groups to	UN Women	22,982	29,982	9,982	-	62,946	Costs consultation/workshop to co-create the impact stories including venue and travel + costs of firm for design of the publications + partial costs of gender and social cohesion officer in providing technical support including mentoring and capacity building for the young men and women as well as facilitating partnerships with media houses and universities for advocacy events and campaigns.

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Activity	Description	EE	2025	2026	2027	2028	Total	Budget Notes
	mobilise partnerships for joint advocacy and media campaigns.							
6.3.6	Support eco-journalism through youth-led Citizen's Reports on Climate-Resilient Watersheds in the Indus River Basin in six selected districts and linkage development with private sector media houses.	UNICEF	5,000	25,000	-	-	30,000	The cost includes consultant fee for engagement of youth on eco journalism and private sector media houses.
6.3.7	Develop an advocacy campaign to replicate the project adaptation solutions and use its knowledge products in cooperation with the PPP elsewhere in settlements around the Indus River and regionally.	UNICEF	45,000	60,000	40,895	35,000	180,895	The cost includes consultant fee for development of advocacy plan and its execution engaging targeted communities around the Indus basin for replication of the successful adaptation solutions
6.3.8	Undertake public awareness campaigns in Hunza, Gilgit, Swat, Nowshera, Peshawar, Sukkur, Khairpur, Sanghar and Karachi districts, one in each district, focusing on adaptation practices for resilience and context-specific hazards and risks at individual, household, and community levels and harness the interrelated benefits of climate change adaptation, social cohesion, and gender equality.	UN Women	-	26,000	17,000	18,000	61,000	The cost includes consultant company for support in developing advocacy campaigns in collaboration with the women groups and implementation support + costs of campaigns including visibility materials etc.
Project Activities Cost			**2,249,070**	**3,809,013**	**2,127,526**	**440,076**	**8,625,685**	
Project Execution Cost (1.5%)		ICIMOD	10,850	11,870	12,990	7,140	42,850	The cost breakup is given at Section III/0
Project Execution Cost (9.5%)		UNICEF	118,370	147,150	152,670	82,758	500,948	The cost breakup is given at Section III/0
Project Execution Cost (9.5%)		UN Women	11,850	13,000	14,265	7,992	47,107	The cost breakup is given at Section III/0
Total Project/Programme Cost			**2,390,140**	**3,981,033**	**2,307,451**	**537,966**	**9,216,590**	
Project Cycle Management Fee charged by IE (8.5%)		ICIMOD	191,850	214,800	229,260	147,500	783,410	The cost breakup is given at Section III/00
Amount of Financing Requested			**2,581,990**	**4,195,833**	**2,536,711**	**685,466**	**10,000,000**	

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Table 16: Breakdown of Project Execution Cost

Description	Year 1	Year 2	Year 3	Year 4	Total
ICIMOD (1.5%)					
Staff - Project Support (Finance, Communication, logistic, Admin)	5,000	5,500	6,050	3,330	19,880
Project financial audit	4,000	4,400	4,840	2,660	15,900
Travel related to project execution	1,200	1,320	1,450	825	4,795
Office facilities, equipment and communications	650	650	650	325	2,275
Sub-Total for ICIMOD	**10,850**	**11,870**	**12,990**	**7,140**	**42,850**
UNICEF (9.5%)					
Staff - Project Manager	36,000	39,600	43,560	23,950	143,110
Staff - Project Support (Communication, logistic, Admin)	18,000	19,800	21,780	11,980	71,560
Staff - Project Finance	20,000	22,000	24,200	13,310	79,510
Project financial audit	5,700	6,270	6,900	3,795	22,665
Travel related to project execution (RBM, Action Tracker and Financial review)	20,100	36,000	30,000	15,000	101,100
Project supervision missions and steering committee meetings	2,870	6,000	6,600	3,630	19,100
Environment and Social (E&S) Risk Monitoring	5,700	6,480	7,130	3,900	23,210
Office facilities, equipment and communications	10,000	11,000	12,500	7,193	40,693
Sub-Total for UNICEF	**118,370**	**147,150**	**152,670**	**82,758**	**500,948**
UN Women (9.5%)					
Staff - Project Manager	6,000	6,600	7,260	4,000	23,860
Staff - Project Support (Finance, Communication, logistic, Admin)	4,000	4,400	4,840	2,660	15,900
Project financial audit	350	350	350	332	1,382
Travel related to project execution	1,500	1,650	1,815	1,000	5,965
Sub-Total for UN Women	**11,850**	**13,000**	**14,265**	**7,992**	**47,107**
Total Execution Cost	**141,070**	**172,020**	**179,925**	**97,890**	**590,905**

Table 17: Breakdown of Project Cycle Management Fee

Description	Year 1	Year 2	Year 3	Year 4	Total
Staff - Project Manager	36,000	37,800	39,700	20,840	134,340
Staff - Project Support (Communication, logistic, Admin)	32,000	33,600	35,280	18,520	119,400
Staff - Project Finance	28,000	29,400	30,870	16,200	104,470
Staff - Communication, M & E and GESI	17,000	17,850	18,750	9,840	63,440
Staff - Management Support, Technical Advisory and expert support	33,000	34,650	36,385	38,200	142,235
Project financial audit and compliance	5,500	6,000	6,500	7,000	25,000
Travel related to project execution (RBM, Action Tracker and Financial review)	17,500	20,000	25,000	18,000	80,500

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Project supervision missions and steering committee meetings	7,150	15,000	15,750	8,200	46,100
Environment and Social (E&S) Risk Monitoring	5,700	10,000	10,000	5,000	30,700
Office facilities, equipment and communications	10,000	10,500	11,025	5,700	37,225
Total Project Cycle Management Fee	**191,850**	**214,800**	**229,260**	**147,500**	**783,410**

H. Disbursement Schedule

Project period: 1 January 2025 to 30 June 2028

	Upon signature of Agreement	One Year after Project Start	Year	Year 3	Year 4	Total
Scheduled date	1 Jan 2025	1 Jan 2026	1 Jan 2027	1 Jan 2028		
Project Funds	2,390,140	3,981,033	2,307,451	537,966		9,216,590
Implementing Entity Fees	191,850	214,800	229,260	147,500		783,410
Total	**2,581,990**	**4,195,833**	**2,536,711**	**685,466**		**10,000,000**

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PART IV: ENDORSEMENT BY GOVERNMENT AND CERTIFICATION BY THE IMPLEMENTING ENTITY

A. Record of Endorsement on behalf of the Government

Mr. Muhammad Farooq Senior Joint Secretary Ministry of Climate Change & Environmental Coordination Government of Pakistan	10th July 2024

GOVERNMENT OF PAKISTAN
MINISTRY OF CLIMATE CHANGE & ENVIRONMENTAL COORDINATION
******

D.O. No. F. 1(1)/2024/Misc Islamabad, the 10th July, 2024.

Subject:- **ENDORSEMENT FOR SUSTAINABLE ACTIONS FOR ECOSYSTEM RESTORATION IN PAKISTAN (SAFER PAKISTAN)OFFICE MEMORANDUM**

Ministry of Climate Change as designated authority for the Adaptation Fund in Pakistan, confirms that the above national project proposal is in accordance with government's national priorities in implementing adaptation activities to reduce adverse impacts of, and risks posed by climate change in Pakistan.

2. Accordingly, the full proposal is endorsed for submission to Adaptation Fund. If approved, the project will be implemented by the International Centre for Integrated Mountain Development (ICIMOD) and executed by the ICIMOD, the United Nations Children's Fund (UNICEF) Pakistan, and United National Entity for Gender Equality and the Empowerment of Women (UN Women).

(Muhammad Farooq)
Sr. Joint Secretary

Adaptation Fund Board,
Secretariat.

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F. No. 1-2023/KOICA/Living-

Subject: **ENDORSEMEN RESTORATIOI**

Ministry of Clim
in Pakistan, confirms that the
government's national prioriti
impacts of, and risks, posed

2. Accordingly, the
approved, the project will b
Mountain Development and
Pakistan, and the United Nat

Adaptation Fund Board
Secretariat

CC:
Dr. Saima Shafique, D

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B. Implementing Entity Certification

I certify that this proposal has been prepared in accordance with guidelines provided by the Adaptation Fund Board, and prevailing National Development and Adaptation Plans of the Islamic Republic of Pakistan and subject to the approval by the Adaptation Fund Board, commit to implementing the project in compliance with the Environmental and Social Policy and the Gender Policy of the Adaptation Fund and on the understanding that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this project.	
Name & Signature Izabella Koziell Deputy Director General International Centre for Integrated Mountain Development	
Date: 27th July 2024	Tel. and email: +977 1 5275222 ext. 208; izabella.koziell@icimod.org
Project Contact Person: Faisal Mueen Qamer	
Tel. and Email: +977 1 5275222 ext. 120; faisal.qamer@icimod.org	

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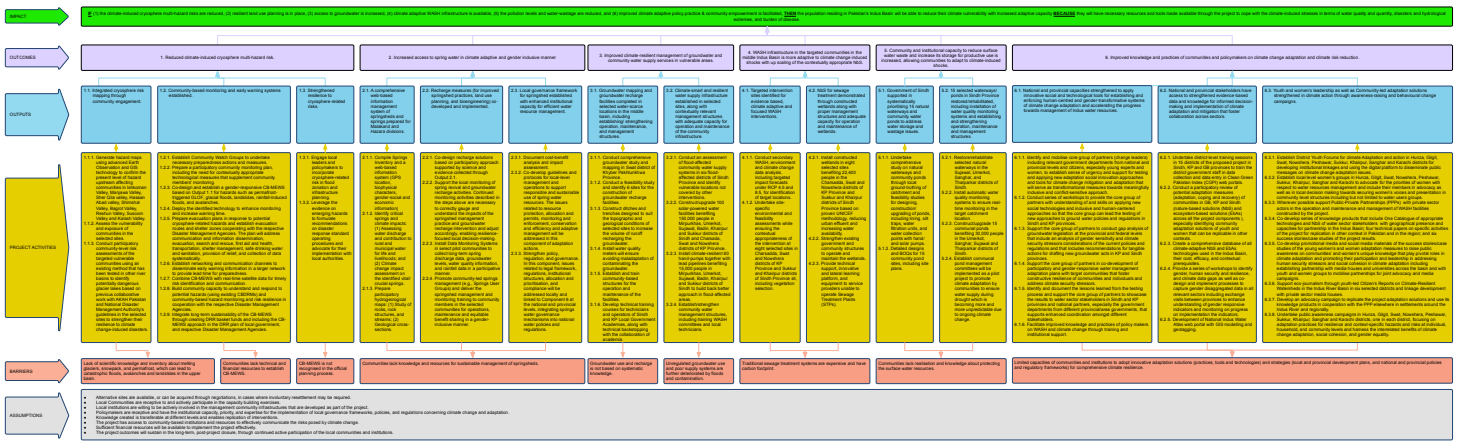
Annex 1: Theory of Change

Also attached separately for better readability



Notes: AKAH = Aga Khan Agency for Habitat; BCDs = bill of quantities; CBOs = community-based organisations; CB-MEWS = community-based disaster risk management; CB-MEWS = community-based monitoring and early warning system; CGPCP = Clean Green Pakistan Champions Programme; CGPI = Clean Green Pakistan Initiative; CSOs = community support organisations; DRR = disaster risk reduction; EbAs = ecosystem-based approaches; GB = Gilgit-Baltistan; GIS = geographic information system; GPS = Global Positioning System; KP = Khyber Pakhtunkhwa; NbS = nature-based solutions; RCP = Representative Concentration Pathway; SOPs = standard operating procedures; WASH = water, sanitation and hygiene

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Annex 2: Indicative Work Plan for the Project

Component/ Outcome	Output	Activity	2025				2026				2027				2028	
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Component 1: Cryosphere DRR Outcome 1: Reduced climate-induced cryosphere multi-hazard risk.	Output 1.1: Integrated cryosphere risk mapping through community engagement.	1.1.1: Generate hazard maps using advanced Earth Observation and GIS technology to confirm the present level of hazard upstream affecting communities in Ishkoman Valley, Manjawa Valley, Sher Qila valley, Hasaan Abad valley, Shimshal Valley, Bagrot Valley, Reshun Valley and Swat.														
		1.1.2: Assess the vulnerability and exposure of communities in the selected sites.														
		1.1.3: Conduct participatory community-level risk assessments of the targeted vulnerable communities using an existing method that has been tested in other river basins to identify potentially dangerous glacier lakes based on previous collaborative work with AKAH Pakistan and National Disaster Management Authority's guidelines in the selected sites to strengthen their resilience to climate change-induced disasters.														
	Output 1.2: Community-based monitoring and early warning systems established.	1.2.1: Establish Community Watch Groups to undertake necessary preparedness actions and measures.														
		1.2.2: Prepare a participatory community monitoring plan, including the need for contextually appropriate technological measures that supplement community members' monitoring.														
		1.2.3: Co-design and establish a gender-responsive CB-MEWS based on Output 1.1 for hazards such as permafrost-triggered GLOF, glacial floods, landslides, rainfall-induced floods, and avalanches.														
		1.2.4: Deploy the identified technology to enhance monitoring and increase warning time.														
		1.2.5: Prepare evacuation plans in response to potential cryosphere-related hazards and establish evacuation routes and shelter zones cooperating with the respective Disaster Management Agencies. The plan will address communication and information dissemination, evacuation, search, and rescue, first aid and health, transportation, shelter management, safe drinking water and														

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Component/ Outcome	Output	Activity	2025				2026				2027				2028	
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
		sanitation, provision of relief, and collection of data systematically.														
		1.2.6: Establish networking and communication channels to disseminate early warning information in a larger network to provide lead time for preparedness.														
		1.2.7: Combine CB-MEWS with real-time satellite data for timely risk identification and communication.														
		1.2.8: Build community capacity to understand and respond to potential hazards (using existing CBDRMs) and community-based hazard monitoring and risk resilience in cooperation with the respective Disaster Management Agencies.														
		1.2.9: Integrate long-term sustainability of the CB-MEWS through creating DRR basket funds and including the CB-MEWS approach in the DRR plan of local government, and respective Disaster Management Agencies.														
	Output 1.3: Strengthened resilience to cryosphere-related risks.	1.3.1: Engage local leaders and policymakers to incorporate cryosphere-related risk in flood zonation and infrastructure planning.														
		1.3.2: Leverage the evidence on emerging hazards to formulate recommendations on disaster response standard operating procedures and advocate for their implementation with local authorities.														
Component 2: Springshed Revival and Management Outcome 2: Increased access to spring water in climate adaptive and gender inclusive manner.	Output 2.1: A comprehensive web-based information management system of springsheds and springs prepared for Malakand and Hazara divisions.	2.1.1: Compile Springs Inventory and a web-based information system (GPS location, biophysical characters, gender-social and economic information)														
		2.1.2: Identify critical springs and climate impacts: (1) Assessing water discharge and contribution to rural and municipal water for life and livelihoods; and (2) Climate change impact assessment on the identified vital/crucial springs.														
		2.1.3: Prepare participatory hydrogeological maps: (1) Study of rocks, rock structures, and streams; (2) Geological cross-sections.														

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Component/ Outcome	Output	Activity	2025				2026				2027				2028	
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
	Output 2.2: Recharge measures (for improved springshed practices, land use planning, and bioengineering) co-developed and implemented.	2.2.1: Co-design recharge solutions based on participatory approach supported by science and evidence collected through Output 2.1.														
		2.2.2: Support the local monitoring of spring revival and groundwater recharge activities. Continued monitoring activities described in the steps above are necessary to correctly gauge and understand the impacts of the springshed management practice and groundwater recharge intervention and adjust accordingly, enabling resilience-focused local decision-making.														
		2.2.3: Install Data Monitoring Systems in select pilot communities to collect long-term spring discharge data, groundwater levels, water quality information, and rainfall data in a participative manner.														
		2.2.4: Promote community-led springs management (e.g., Springs User Groups) and deliver the springshed management and monitoring training to community members in the selected communities for operations, maintenance and equitable benefit sharing in a gender-inclusive manner.														
	Output 2.3: Local governance framework for springshed established with enhanced institutional capacity for efficient water resource management.	2.3.1: Document cost-benefit analysis and impact assessment.														
		2.3.2: Co-develop guidelines and protocols for local-level management and operations to support responsible and sustainable use of spring water resources. The issues related to resource protection, allocation and permits, monitoring and enforcement, conservation and efficiency and adaptive management will be addressed in this component of adaptation actions.														
		2.3.3: Strengthen policy, regulation, and governance. In this component, issues related to legal framework, regulations, institutional structures, allocation and prioritisation, and compliance will be addressed locally and linked to Component 6 at the national and provincial levels, integrating springs water governance mechanisms into national water policies and regulations.														

Component/ Outcome	Output	Activity	2025				2026				2027				2028	
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Component 3: Groundwater Management and Resilience of Community Water Supply Services Outcome 3: Improved climate-resilient management of groundwater and community water supply services in vulnerable areas.	Output 3.1: Groundwater mapping and groundwater recharge facilities completed in selected water-scarce locations in the middle basin, including establishing/ strengthening operation, maintenance, and management structures.	3.1.1: Conduct comprehensive groundwater study and mapping in Swat district of Khyber Pakhtunkhwa province.														
		3.1.2: Conduct a feasibility study and identify 6 sites for the construction of groundwater recharge facilities.														
		3.1.3: Construct ditches and trenches designed to suit the topographic and geological conditions of selected sites to increase the volume of runoff recharging the groundwater.														
		3.1.4: Install water quality meters will ensure avoiding maladaptation of contaminating the groundwater.														
		3.1.5: Establish and train community-based structures for the operation and maintenance of the facilities.														
		3.1.6: Develop technical training courses for technicians and operators of Sindh and KP Local Government Academies, along with technical backstopping with the collaboration of academia.														
	Output 3.2: Climate-smart and resilient water supply infrastructure established in selected sites, along with contextually relevant management structures with adequate capacity for operation and maintenance of the community infrastructure.	3.2.1: Conduct an assessment of flood-affected community water supply systems in six flood-affected districts of Sindh Province and identify vulnerable locations not covered by other interventions.														
		3.2.2: Construct/upgrade 100 solar-powered water facilities benefiting 150,000 people in Mirpurkhas, Umerkot, Sujawal, Badin, Khairpur and Sukkur districts of Sindh and Charsadda, Swat and Nowshera districts of KP Province.														
		3.2.3: Install climate-resilient 60 handpumps together with lead pipelines benefiting 15,000 people in Mirpurkhas, Umerkot, Sujawal, Badin, Khairpur and Sukkur districts of Sindh to build back better approach in flood-affected areas.														
		3.2.4: Establish/strengthen community water management structures, including training WASH committees and local technicians.														
	Output 4.1: Targeted intervention sites	4.1.1: Conduct secondary WASH, environment, and climate change data analysis, including														

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Component/ Outcome	Output	Activity	2025				2026				2027				2028	
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Component 4: Ecosystem-based Solutions Outcome 4: WASH infrastructure in the targeted communities in the Middle Indus Basin is more adaptive to climate change-induced shocks with up scaling of the contextually appropriate NbS.	identified for evidence-based, climate adaptive and focused WASH interventions.	targeted impact forecasts under RCP 4.5 and 8.5, for identification of target locations.														
		4.1.2: Undertake site-specific environmental and feasibility assessments while ensuring the contextual appropriateness of the intervention at eight selected sites in Charsadda, Swat and Nowshera districts of KP Province and Sukkur and Khairpur districts of Sindh Province sit, including vegetation selection.														
	Output 4.2: NbS for sewage treatment demonstrated through constructed wetlands along with proper management structures and adequate capacity for operation and maintenance of wetlands.	4.2.1: Install constructed wetlands in eight selected sites benefiting 22,400 people in the Charsadda, Swat and Nowshera districts of KP Province and Sukkur and Khairpur districts of Sindh Province based on proven UNICEF methodology, reducing urban effluent, and increasing water availability.														
		4.2.2: Strengthen existing government and community structures to operate and maintain the wetlands.														
		4.2.3: Provide technical support, innovative and lateral learning platform, and equipment to service providers unable to operate Sewage Treatment Plants (STPs).														
Component 5: Surface Water Conservation Outcome 5: Community and institutional capacity to reduce surface water waste and increase its storage for productive use is increased, allowing communities to adapt to climate-induced shocks.	Output 5.1: Government of Sindh supported in systematically prioritising 15 natural waterways and community water ponds to address water storage and wastage issues.	5.1.1: Undertake comprehensive study on natural waterways and community ponds through local ground-truthing of catchment and feasibility studies for designing, construction/upgrading of ponds, including lining, silt traps, water filtration units, and water collection points with hand/and solar pumps.														
		5.1.2: Detailed designs and BOQs for 15 community pond sites, including site plans.														
	Output 5.2: 15 selected waterways/ponds in Sindh Province restored/rehabilitated, including installation of water quality monitoring systems and establishing and	5.2.1: Restore/rehabilitate selected natural waterways in the Sujawal, Umerkot, Sanghar, and Tharparkar districts of Sindh.														
		5.2.2: Install automatic water quality monitoring systems to ensure real-time monitoring in the target catchment location.														
		5.2.3: Construct/upgrade 15 communal ponds benefiting 30,000 people in the Umerkot, Sanghar, Sujawal and Tharparkar districts of Sindh.														

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Component/ Outcome	Output	Activity	2025				2026				2027				2028	
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
	strengthening operation, maintenance, and management structures.	5.2.4: Establish communal pond management committees will be implemented as a pilot project to promote climate adaptation by communities to ensure water supply during drought which is becoming more and more unpredictable due to ongoing climate change.														
Component 6: Adaptive capacities and empowered communities Outcome 6: Improved knowledge and practices of communities and policymakers on climate change adaptation and climate risk reduction.	Output 6.1: National and provincial capacities strengthened to apply innovative social and technological tools for establishing and enforcing human-centred and gender-transformative systems of climate change adaptation and accelerating the progress towards management of Indus water resources.	6.1.1: Identify and mobilise core group of partners (change leaders) including relevant government departments from national and provincial levels and citizens, especially young experts and women, to establish sense of urgency and support for testing and applying new adaptation social innovation approaches and tools for climate change mitigation and adaptation that will serve as transformational measures towards meaningfully inclusive and conflict-sensitive approach														
		6.1.2: Conduct series of workshops to provide the core group of partners with understanding of and skills on applying new social technologies and inclusive and human-centred approaches so that the core group can lead the testing of new approaches to groundwater policies and regulations in Sindh and KP provinces														
		6.1.3: Support the core group of partners to conduct gap analysis of groundwater legislation at the provincial and federal levels that include an analysis of gender sensitivity and climate security stressors considerations of the current policies and regulations and that includes recommendations for tangible actions for drafting new groundwater acts in KP and Sindh provinces														
		6.1.4: Support the core group of partners in co-development of participatory and gender-responsive water management adaptation plans with target communities that foster constructive resilience of communities and individuals and address climate security stressors														
		6.1.5: Identify and document the lessons learned from the testing process and support the core group of partners to showcase the results to water sector stakeholders in Sindh and KP provinces and national partners, especially the government														

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Component/ Outcome	Output	Activity	2025				2026				2027				2028	
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
		departments from different provincial/area governments, that supports enhanced coordination amongst different stakeholders														
		6.1.6: Facilitate improved knowledge and practices of policy makers on WASH and climate change through training and institutional support														
	Output 6.2: National and provincial stakeholders have access to strengthened evidence-based data and knowledge for informed decision-making and implementation of climate adaptation and mitigation that foster collaboration across sectors	6.2.1: Undertake district-level training sessions in 15 districts of the proposed project in Sindh, KP and GB provinces to train the district government staff in data collection and data entry in Clean Green Pakistan Index (CGPI) web portals														
		6.2.2: Conduct a participatory review of potential adaptation measures (adaptation, coping and recovery) of communities in GB, KP and Sindh (nature-based solutions (NbS) and ecosystem-based solutions (EbAs) across all the project components), especially identifying community adaptation solutions of youth and women that can be replicable in other contexts														
		6.2.3: Create a comprehensive database of all climate-adaptive NbS and EbAs technologies used in the Indus Basin, their cost, efficacy, and contextual prerequisites														
		6.2.4: Provide a series of workshops to identify gender, human security and resilience, and climate data gaps as well as co-design and implement processes to capture gender disaggregated data in all relevant sectors including exchange visits between provinces to enhance understanding of gender responsive indicators and monitoring on progress on implementation the indicators														
		6.2.5: Development of National Indus Water Atlas web portal with GIS modelling and geotagging														
	Output 6.3: Youth and women's leadership as well as community-led adaptation solutions strengthened in climate action	6.3.1: Establish District Youth Forums for climate Adaptation and action in Hunza, Gilgit, Swat, Nowshera, Peshawar, Sukkur, Khairpur, Sanghar and Karachi districts for developing institutional linkages and using the digital platform to disseminate public messages on climate change adaptation issues														

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Deleted: 6.1.6: Advocate for establishing National Water Regulatory Authority as per findings of ongoing UNICEF study on 'legislative gap analysis in climate-resilient WASH sector.

Deleted: 6.2.1: Integrate the CGPCP data into the Living Indus Knowledge Platform: Crowdsourcing Knowledge Platform.

Deleted: 6.2.2: Organise a workshop to validate the indicators for contextual appropriateness, focusing on Sindh, KP and GB.

Deleted: An extensive knowledge repository on climate change and WASH practices developed.

Deleted: 6.2.3: Undertake district-level training sessions in 15 districts of the proposed project in Sindh, KP and GB provinces to train the district government staff in data collection and data entry in CGPI web portals.

Deleted: 6.2.4: Expand the national database of the CGPI, housed in the MoCC&EC, on which district governments report regular data from two provinces for 55 predefined indicators of five major components of this project, i.e., Water, Sanitation, Hygiene, Liquid and Solid Waste Management and Plantation.

Deleted: 6.2.5: Provide technical support to the MoCC&EC to review the climate adaptation data against indicators being reported by districts.

Deleted: 6.3.1: Build Public-Private Partnerships (PPPs) across the basin with private sector actors in the sanitation, construction, and finance sectors.

Component/ Outcome	Output	Activity	2025				2026				2027				2028	
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
	through awareness raising and behavioural change campaigns	6.3.2: Establish local level women's groups in Hunza, Gilgit, Swat, Nowshera, Peshawar, Sukkur, Khairpur, Sanghar and Karachi to advocate for the priorities of women with respect to water resources management and include their members in advocacy as well as in local decision making towards securing women's voices and presentation in community level structures including but not limited to water users groups														
		6.3.3: Wherever possible support Public-Private Partnerships (PPPs) with private sector actors in the operation and maintenance and management of WASH facilities constructed by the project														
		6.3.4: Co-develop series of knowledge products that include One Catalogue of appropriate technologies and NbS of water sector stakeholders with geographical presence and capacities for partnership in the Indus Basin ; four technical papers on specific activities of the project for replication in other context in Pakistan and in the region; and six success stories/case studies of the project results														
		6.3.5: Co-develop promotional media and social media materials of the success stories/case studies of the young women's and women adaptation measures to raise public awareness on communities' and women's unique knowledge that play pivotal roles in climate adaptation and promoting their participation and leadership in addressing human security stressors and social cohesion in climate adaptation including establishing partnership with media houses and universities across the basin and with youth and women groups to mobilise partnerships for joint advocacy and media campaigns														
		6.3.6: Support eco-journalism through youth-led Citizen's Reports on Climate-Resilient Watersheds in the Indus River Basin in six selected districts and linkage development with private sector media houses														
		6.3.7: Develop an advocacy campaign to replicate the project adaptation solutions and use its														

Deleted: Community-led adaptation solutions widely adopted through awareness-raising and behavioural change.

Deleted: 6.3.2: Expand the CGPCP's web portal and mobile phone application to expand its registration capacity and ensure equitable inclusion of girls, the poor, and persons with disabilities through special incentives and awards.

Deleted: 6.3.3: Conduct a participatory review of potential adaptation measures of communities, along with an analysis of gender sensitivity of the current adaptation measures and policies and regulations of climate adaptation that will guide infrastructure investments.

Deleted: 6.3.4: Establish District Youth Forums for Climate Adaptation and Action in Hunza, Gilgit, Swat, Nowshera, Peshawar, Sukkur, Khairpur, Sanghar and Karachi districts for developing institutional linkages and using the digital platform to disseminate public messages on climate change adaptation issues.

Deleted: 6.3.5: Facilitate the development of participatory and gender-responsive water management adaptation plans with target communities that foster constructive resilience of communities and individuals and address climate security stressors.

Deleted: 6.3.6: Develop an advocacy campaign to replicate the project adaptation solutions and use its knowledge products in cooperation with the PPP elsewhere in settlements around the Indus River.

Component/ Outcome	Output	Activity	2025				2026				2027				2028	
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
		knowledge products in cooperation with the PPP elsewhere in settlements around the Indus River and regionally														
		6.3.8: Undertake public awareness campaigns in Hunza, Gilgit, Swat, Nowshera, Peshawar, Sukkur, Khairpur, Sanghar and Karachi districts, one in each district, focusing on adaptation practices for resilience and context-specific hazards and risks at individual, household, and community levels and harness the interrelated benefits of climate change adaptation, social cohesion, and gender equality														

Deleted: 6.3.7: Co-develop success stories/case studies that can be transformed into short social and traditional media promotional material to raise public awareness.

Deleted: 6.3.8: Undertake public awareness campaigns in Hunza, Gilgit, Swat, Nowshera, Peshawar, Sukkur, Khairpur, Sanghar and Karachi districts, focusing on adaptation practices for resilience and context-specific hazards and risks at individual, household, and community levels.

Annex 3: E&S Impact Analysis and Management Planning

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1. Summary Description of the Project

The ensued project is planned addresses six distinct impacts of climate change affecting the population of Pakistan's Indus Basin faces: (1) cryosphere-related hazards in the upper basin; (2) drying up of springs linked to rural and municipal water supplies in the middle basin; (3) depletion of groundwater levels and lack or limited climate-resilient water supply facilities in the middle and lower basin; (4) increasing toxicity of urban effluent in the lower Basin; and (5) dwindling availability of surface water for households in the lower Basin; (6) limited technical and adaptive capacities and coordination as well as exclusion of youth and women from policy development and implementation that affect Indus River basin. To address these climate-related threats, the project mobilises the expertise of ICIMOD, UNICEF and UN Women to achieve the following outcome:

1. Reduced climate-induced cryosphere multi-hazard risk.
2. Increased access to spring water in climate adaptive and gender-inclusive manner.
3. Improved climate-resilient management of groundwater and community water supply services in vulnerable areas.
4. WASH infrastructure in the targeted communities in the Middle Indus Basin is more adaptive to climate change-induced shocks with up scaling of the contextually appropriate NbS.
5. Community and institutional capacity to reduce surface water waste and increase its storage for productive use is increased, allowing communities to adapt to climate-induced shocks.
6. Improved knowledge and practices of communities and policymakers on climate change adaptation and climate risk reduction.

The contributing outputs and activities are detailed in Section II/A. The activities are planned to be implemented at various locations in Gilgit-Baltistan, Khyber Pakhtunkhwa and Sindh provinces of Pakistan (Map 7). The outcome-specific details of these locations with GIS coordinates are provided in Annex 6, and shown on Map 2, Map 3, Map 4 and Map 5, respectively.

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Map 7: SAFER-Pakistan Project Districts in Sindh, KP and GB

2. Screening and Categorisation

After determination of the nature and geography of the proposed activities under the project; a thorough screening exercise was undertaken using both the Adaptation Fund ESP principles and the E&S categorisation proposed by the national and subnational environmental legislation in Pakistan.[33]

The results of ESP based screening of the entire project are shown in Table 9 (in Section II/K) while the national and subnational criteria-based categorisation of the project outputs is shown in Table 18. Based on the screening and resultant categorisation, the project is placed under **E&S Category B**. However, only a few activities under four outputs (2.2, 3.2, 4.2 and 5.2) were found to be having adverse but manageable and reversible E&S impacts and categorised as B, while the remaining outputs had no E&S adverse impacts, hence placed under E&S Category C (Table 18). Accordingly, despite the entire project being subject to ESIA, the special focus remained on Outputs 2.2, 3.2, 4.2 and 5.2 for which the ESMP has been developed and presented in Section 5 of this Annex. For a very few USPs, the activity-specific ESIA and mitigation planning procedure has been elaborated in Section III/C.1.

Table 18: Output Level E&S Categorisation against National Environmental Criteria

E&S Category[34]	Outputs
A	None
B	Output 2.2: Recharge measures (for improved springshed practices, land use planning, and bioengineering) co-developed and implemented. Output 3.2: Climate-smart and resilient water supply infrastructure established in selected sites, along with contextually relevant management structures with adequate capacity for operation and maintenance of the community infrastructure. Output 4.2: NbS for sewage treatment demonstrated through constructed wetlands along with proper management structures and adequate capacity for operation and maintenance of wetlands. Output 5.2: 15 selected waterways/ponds in Sindh Province restored/rehabilitated, including installation of water quality monitoring systems and establishing and strengthening operation, maintenance, and management structures.
C	Output 1.1: Integrated cryosphere risk mapping through community engagement. Output 1.2: Community-based monitoring and early warning systems established. Output 1.3: Strengthened resilience to cryosphere-related risks. Output 2.1: A comprehensive web-based information management system of springsheds and springs prepared for Malakand and Hazara divisions. Output 2.3: Local governance framework for springshed established with enhanced institutional capacity for efficient water resource management. Output 3.1: Groundwater mapping and groundwater recharge facilities completed in selected water-scarce locations in the middle basin, including establishing/ strengthening operation, maintenance, and management structures. Output 4.1: Targeted intervention sites identified for evidence-based, climate adaptive and focused WASH interventions. Output 5.1: Government of Sindh supported in systematically prioritising 15 natural waterways and community water ponds to address water storage and wastage issues. Output 6.1: National and provincial capacities strengthened to apply innovative social and technological tools for establishing and enforcing human-centred and gender-transformative systems of

[33] *Pakistan Environmental Protection Act 1997*. Ministry of Environment, Government of Pakistan. Enacted 6 Dec 1997.

Pakistan Environmental Protection Agency Review of Initial Environmental Examination and Environmental Impact Assessment Regulations, 2000. Pakistan Environmental Protection Agency, Government of Pakistan. Notified 13 Jun 2000.

Gilgit-Baltistan Environmental Protection Act, 2014. Government of Gilgit-Baltistan. Enacted 4 Dec 2014.

Khyber Pakhtunkhwa Environmental Protection Act, 2014. Government of Khyber Pakhtunkhwa. Enacted 4 Dec 2014.

Khyber Pakhtunkhwa Environmental Assessment Rules, 2021. Government of Khyber Pakhtunkhwa. Notified 2 Sep 2021.

Sindh Environmental Protection Act, 2014. Government of Sindh. Enacted 19 Mar 2014.

Sindh Environmental Protection Agency (Review of Initial Environmental Examination and Environmental Impact Assessment) Regulations, 2014. Notified 16 Dec 2014.

[34] Projects/ programmes likely to have significant adverse environmental or social impacts that are for example diverse, widespread, and irreversible should be categorised as Category A. Projects/programmes with potential adverse impacts that are less adverse than Category A projects/programmes, because for example they are fewer in number, smaller in scale, less widespread, reversible or easily mitigated should be categorised as Category B. Those projects/programmes with no adverse environmental or social impacts should be categorised as Category C.

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E&S Category[34]	Outputs
	climate change adaptation and accelerating the progress towards management of Indus water resources. Output 6.2: An extensive knowledge repository on climate change and WASH practices developed. Output 6.3: Community-led adaptation solutions widely adopted through awareness-raising and behavioural change.

3. Environmental and Social Impact Assessment

Primarily, there are three types of activities planned under the project:

1. Research activities involving desk studies and field data collection and/or investigations to document the climate induced risks and develop tools for mitigating these risks.
2. Knowledge management and dissemination activities without any physical interventions aimed at policy and procedural changes for enhancing climate resilience.
3. On-ground physical activities involving construction and/or earthmoving activities.

The first two types of activities do not have any environmental impact. The social impact is restricted to the extent of social inclusion and gender transformation which can easily be managed through avoidance or enhancing measures. However, the physical activities may have environmental (related to land, air, water and biodiversity) and social (related to land acquisition, labour, human rights, social inclusion and culture) impacts for which E&S impact assessment and mitigation planning is required. While the entire project has been screened, categorised and assessed for E&S impacts, the focus has been on the activities (under Outputs 2.2, 3.2, 4.2 and 5.2) which are of physical nature and are likely to have some E&S impacts. There also a few USPs for which the activity-specific ESIA and mitigation planning procedure has been elaborated in Section III/C.1. The remaining activities of the project are found to have no adverse E&S impacts, primarily because of nature-based adaptation measures which are aimed at restoring the natural equilibrium.

Following are findings of the ESIA conducted for the project against 15 ESP principles.

1. Compliance with the Law

Having been designed through a wide consultative process with the relevant stakeholders, especially in the policy and regulation realm, the project is fully compliant of the national and sub-national environmental laws and regulations. All activities planned under outcomes 1, 2 and 6, and most of the activities under the remaining outcomes have no environmental and social impacts, hence; categorised as C and do not require any E&S management planning. Some activities under outcomes 3, 4 and 5 are expected to have adverse but manageable E&S impacts; hence, categorised as B and would require ESMP to be developed. Additionally, to comply with the relevant subnational environmental legislation, these activities will be subject to full scale ESIA during the implementation as following:

- Activities under Outputs 2.2 (recharge pits, trenches, absorption terraces, small ponds and check dams at 10 locations), 3.2 (100 solar-powered water facilities and 60 handpumps) and 4.2 (8 constructed wetlands) in KP may result in overexploitation of water, community disagreements over water shares, unmanaged residuals from constructed wetlands; hence, require development and submission of Initial Environmental Examination (IEE) to the KP EPA.
- Activities under Outputs 3.2 (100 solar-powered water facilities and 60 handpumps), 4.2 (8 constructed wetlands) and 5.2 (15 waterways/community ponds) in Sindh may result in overexploitation of water, community disagreements over water shares, unmanaged residuals from constructed wetlands; hence, require development and submission of Checklists to the Sindh EPA before starting the implementation.

Following the ESIA, ESMP has been developed for these activities and presented in Section 5 of this Annex. However, before initiation of these activities the project would need to obtain the relevant Environmental Approval from the respective EPAs according to the respective environmental legislation.

2. Access and Equity

No adverse impacts in terms of access and equity are expected from the project interventions. The project implementation is planned to be built upon community mobilisation, and inclusive and sustainable development principles; hence, ensuring an equitable and inclusive benefit sharing through the project interventions without any discrimination or favouritism. Nevertheless, the project would remain cognisant of this ESP principle through the regular E&S monitoring.

3. Marginalised and Vulnerable Groups

In certain project areas, there are some marginalised groups such as Kailash in Chitral district of Khyber Pakhtunkhwa province and Kolhi in Tharparkar district of Sindh province who have been identified and included in the consultations. In

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Activities under outputs 3.2, 4.2 and 5.2 (solar-powered water facilities, constructed wetlands, sewage treatment plants, community ponds) in KP will require development and submission of Initial Environmental Examination (IEE) to the KP EPA.¶
An initial screening for environmental and social risks expected from these activities has been conducted as part of the feasibility study and presented in Table 14. An environmental and social management plan (ESMP) has also been developed accordingly and presented in Annex 3.

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ensuring do-no-harm approach, the project respects the identities of all groups and avoids any discrimination or negative impacts to any groups due to the project activities.

Moreover, the project prioritises equitable engagement with all communities, for example, these groups have already been included in the consultations and their voices and needs have been incorporated into the project design (Section II/H and Annex 12). This will continue throughout the project implementation with a special attention being paid that the groups are equally benefitting from the project.

The disaggregated data collection and reporting will take transparent and accountable approach. The active involvement of the communities in the project implementation as well as the monitoring and evaluation mechanisms of the project will ensure that neither marginalised nor vulnerable groups face any disproportionate risk or is excluded from project benefit. The compliance of this ESP principle will continue to be monitored and reported regularly.

4. Human Rights

Pakistan is a signatory to the Universal Declaration of Human Rights (UDHR) and does not fall under special procedures of the Human Rights Council. Human rights-based approach will be a guiding principle of the project implementation. The project's highly participatory nature is a core strength that mitigates the risk of human rights violations. However, given that number of individuals will be involved in the project's physical activities under Outputs 2.2, 3.2, 4.2 and 5.2 in the form of labour, suppliers and beneficiaries, there is an increased risk of human rights violation. Hence, the project will take all the mitigative measure as proposed in the ESMP, will remain vigilant of this ESP principal for any chance find and will keep reporting on it regularly.

5. Gender Equality and Women's Empowerment

Although the project will ensure that none of its activities have any gender-specific negative impacts on the target beneficiaries, and will actively promote gender equality and women's empowerment through strategic integration of gender-transformative components across all project activities, there is still risk of gender equality and women's empowerment issues rising as a result of the project activities. Pakistan's Climate Change Gender Action Plan (2022) is a good starting point for gender-sensitive climate adaptation action that is both inclusive and socially sustainable.

The RIE and Executing Entities (EEs) are fully cognisant of the GESI issues in Pakistan; hence, have undertaken a thorough gender analysis (Annex 5). The consultations have also informed the project design on GESI issues, particularly consultations with women beneficiaries. As detailed in the Gender Action Plan (Annex 5), the project will promote equal participation of women, offer targeted capacity and skills building on gender and women's empowerment, address gender inequalities and foster positive change in gender norms that hinder sustainable and inclusive climate action. For example, the assessments planned as part of the project will consider the specific needs and priorities of women but also their perspectives and solutions that will guide the technical infrastructure components towards ensuring that project benefits all members of the community equally.

From the ESMP perspective, the project will deploy all measures proposed in the Gender Action Plan and will regularly report on its implementation.

6. Core Labour Rights

Pakistan has ratified 36 ILO Conventions, including all eight Fundamental Conventions; so, every project in Pakistan is bound to respect these conventions. The project itself will comply with the 1998 ILO Declaration of Fundamental Principles and Rights at Work, and its convention on fundamental principles and rights (ILO 29, ILO 87, ILO 98, ILO 100, ILO 105, ILO 111, ILO 138, and ILO 182). Nevertheless, the physical activities under Outputs 2.2, 3.2, 4.2 and 5.2, especially related to construction and earthmoving, may pose the risk of labour rights violation. The project will also ensure that the applicable labour laws, especially about minimum wage, fixed working hours, and occupational health and safety, are followed in letter and spirit for implementation of activities under Outputs 2.2, 3.2, 4.2 and 5.2. Also, child labour is prohibited under the Pakistan Penal Code; hence the project will ensure that no child under the age of 18 is hired for any type of labour.

7. Indigenous Peoples

Except in parts of Chitral district, the project areas do not have any reported Indigenous peoples. The Constitution of Pakistan does not recognise any group of people in Pakistan as Indigenous. However, based on WB E&S practices for earlier projects, the project considers the Kailash people in parts of Chitral district as Indigenous.

The project is cognisant of the provisions under the 2007 UN Declaration on the Rights of Indigenous Peoples (UNDRIP) and has obtained Free, Prior, Informed Consent (FPIC) of the Kailash people during the consultations for project design. The same will be followed during implementation of the project. As such, none of the project activities are in contravention of the beliefs, culture and livelihood patterns of the Kailash people; hence, no adverse impacts are anticipated. Nevertheless, the project will develop an Indigenous Peoples Plan during the project implementation, implement it fully and regularly report on its implementation.

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8. Involuntary Resettlement

The ESIA of the project activities and sites informs that there is no involuntary resettlement (either physical or economic displacement) required due to the project activities as the sites are either under the same use or belong to the communities who have consented to allocate the land, if needed, on voluntary basis. The project, in fact, will protect and create more livelihood opportunities for the communities through its structural and non-structural measures. Nevertheless, as some of the project activities under Outputs 2.2, 3.2, 4.2 and 5.2 are expected to have environmental and social impacts (categorised as B), an initial screening for environmental and social risks has been undertaken and presented in Table 9, followed by the ESIA of the project. None of the exercises have found any cases of involuntary resettlement. The project will remain conscious of the safeguard, and will address and report any unexpected involuntary resettlement issue.

9. Protection of Natural Habitats

None of the project sites fall under protected areas regime under any international convention, or the federal, provincial, and sub-national laws. The project will not implement any activities in habitats for plants/animals of ecological importance.

10. Conservation of Biological Diversity

The project is not expected to have any significant or unjustified reduction or loss of biological diversity in the project area. Rather, it is designed to have a positive impact on the biodiversity in the project areas through increased availability of water, protection of water bodies, and managing the surface and groundwater contamination through its activities under Outputs 2.2, 3.2, 4.2 and 5.2. The project is also not introducing any invasive species in the project area.

11. Climate Change

None of the project activities are expected to result in increased emission of GHGs or other drivers of climate change; rather the constructed wetlands (Output 4.2) and community ponds (Output 5.2) will serve as Carbon sinks. Hence, the project will not exacerbate climate change in any way. Solarisation of the water facilities will further reduce GHG emissions otherwise accruing from use of fossil fuels. Also, activities under Outputs 2.2, 3.2, 4.2 and 5.2 fall under NbS aimed at restoring natural equilibrium; hence there are no climate change related impacts of the project activities.

12. Pollution Prevention and Resource Efficiency

Being physical in nature, the activities under Outputs 2.2, 3.2, 4.2 and 5.2 will have some manageable environmental impacts in terms of temporary pollution and resource use. However, to be executed by environmentally and socially responsible organisation like ICIMOD and UNICEF, there will be minimal and most optimal resource utilisation for its activities. The project will also be cognisant of any possible land, air or water pollution caused because of the activities under Outputs 2.2, 3.2, 4.2 and 5.2 and will implement all preventive and mitigation measure proposed by the ESMP, regularly monitor and report accordingly.

13. Public Health

The ESIA identified no public health impacts accruing of the proposed activities. However, a health impact-screening checklist has been used in synch with the ESA tools to identify any possible public health risks and propose appropriate mitigation measures for the same. As a result, no adverse public health impacts accruing from the project activities have been identified. Nevertheless, the drinking water quality will be monitored though community involvement to ensure that there are no health related impacts of the project interventions, especially under Outputs 2.2, 3.2, 4.2 and 5.2. Implementing ESIA, the monitoring results will be reported regularly.

14. Physical and Cultural Heritage

Pakistan has ratified the Convention Concerning the Protection of the World Cultural and Natural Heritage; hence, all projects in Pakistan are bound to comply with its provision. None of the project sites under Outputs 2.2, 3.2, 4.2 and 5.2 is in or near a site that has historic, archaeological or cultural importance. The project will remain cognisant of the fact that none of its activities should offend the local population, damage the local social fabric, and generate conflict with the local community. As there is always risk of any archaeological chance find during excavations, the project will be conscious of the risk and will adopt precautionary measures to handle and report any such case.

15. Lands and Soil Conservation

Cognisant of the fact that fragile soils may be present in some of the project areas (mountainous areas of Gilgit-Baltistan and coastal areas of Badin and Sujawal districts), the project has proposed mitigation measures in the ESMP (Annex 3). However, the project will not implement any activity on productive and valuable lands in the project areas. The project will also regularly monitor the soil quality where the new land is brought under irrigation and/or cultivation as a result of the project activities, especially under Outputs 2.2, 4.2 and 5.2.

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4. Environmental and Social Impact Analysis

Building upon the initial E&S screening and categorisation and assessment against the ESP principles, all project activities have been analysed for any adverse environmental and social impacts using the standard E&S assessment procedure. As a result, some of the activities of physical nature under Outputs 2.2, 3.2, 4.2 and 5.2 have been found having some adverse but reversible and manageable environmental and social impacts. The activities planned under rest of the outputs, and some of the activities even under Outputs 2.2, 3.2, 4.2 and 5.2 are categorised as C having no adverse environmental or social impacts. These activities do not need further assessment as per the national and sub-national environmental regulations. However, a low level monitoring and reporting will continue for the entire project.

Table 19 provides an impact analysis of the project's proposed activities under Outputs 2.2, 3.2, 4.2 and 5.2 (Category B) and describes the potential impacts those could be reasonably expected if no risk management or mitigation measures are put in place.

Table 19: E&S Impact Analysis of Project Outputs Categorised as B

Project Output and Activities under Category B	E&S Impact Analysis
Output 2.2: Recharge measures (for improved springshed practices, land use planning, and bioengineering) co-developed and implemented. Activity 2.2.1: Co-design recharge solutions based on participatory approach supported by science and evidence collected through Output 2.1. Activity 2.2.2: Support the local monitoring of spring revival and groundwater recharge activities. Continued monitoring activities described in the steps above are necessary to correctly gauge and understand the impacts of the springshed management practice and groundwater recharge intervention and adjust accordingly, enabling resilience-focused local decision-making. Activity 2.2.3: Install Data Monitoring Systems in select pilot communities to collect long-term spring discharge data, groundwater levels, water quality information, and rainfall data in a participative manner. Activity 2.2.4: Promote community-led springs management (e.g., Springs User Groups) and deliver the springshed management and monitoring training to community members in the selected communities for operations, maintenance and equitable benefit sharing in a gender-inclusive manner.	**ENVIRONMENTAL IMPACTS** **Positive Impacts** Groundwater Recharge: The recharge solutions at 10 selected sites in Khyber Pakhtunkhwa will help improving the availability and quality of groundwater and rehabilitation of springs. Climate Resilience: The watershed and recharge measure will help Increasing water availability to build climate resilience of the communities facing risk of drought and flash floods. **Negative Impacts** Construction Impact: The construction phase, though of very low intensity, may result in temporary habitat disruption and soil erosion, requiring mitigation measures to minimise environmental degradation. There may also be short-term turbidity in the springs water which will need to be monitored. **SOCIAL IMPACTS** **Positive Impacts** Improved Access to Clean Water: The project will significantly enhance access to clean water for communities through springs, promoting public health and water security. Community Empowerment: Training of committees and local technicians will empower communities to manage and maintain the springs independently and gender-transformative components will increase the number of women and their meaningful participation in the community-level activities. **Negative Impacts** Community Water Rights: There may be some issues around rights of communities on use water of water from springs which will be discussed and resolved before staring the activities. **ECONOMIC IMPACT** **Positive Impacts** Job Creation: The construction and maintenance phases will generate employment opportunities, benefiting local economies. Increased Agricultural Productivity: A reliable water supply supports agricultural activities, potentially boosting local economies. **Negative Impacts** Benefit-Sharing Issues: There may be some problems on cash for work as the project can not engage all of the intending labour. This will be resolved through community interaction, especially the Springs User Groups. **HEALTH AND SAFETY IMPACTS** **Positive Impacts** Improved Health Conditions: Access to clean water will reduce waterborne diseases, positively impacting public health. **Negative Impacts**

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Project Output and Activities under Category B	E&S Impact Analysis
	Safety Risks during Construction: Construction activities may pose safety risks, requiring strict adherence to safety protocols to prevent accidents.
Output 3.2: Climate-smart and resilient water supply infrastructure established in selected sites, along with contextually relevant management structures with adequate capacity for operation and maintenance of the community infrastructure. Activity 3.2.1: Conduct an assessment of flood-affected community water supply systems in six flood-affected districts of Sindh Province and identify vulnerable locations not covered by other interventions. Activity 3.2.2: Construct/upgrade 100 solar-powered water facilities benefiting 150,000 people in Mirpurkhas, Umerkot, Sujawal, Badin, Khairpur and Sukkur districts of Sindh and Charsadda, Swat and Nowshera districts of KP Province. Activity 3.2.3: Construct climate-resilient 60 handpumps together with lead pipelines benefiting 15,000 people in Mirpurkhas, Umerkot, Sujawal, Badin, Khairpur and Sukkur districts of Sindh to build back better approach in flood-affected areas. Activity 3.2.4: Establish/strengthen community water management structures, including training WASH committees and local technicians	**ENVIRONMENTAL IMPACTS** **Positive Impacts** Renewable Energy Use: The installation of 100 solar-powered water facilities in Mirpur Khas, Sanghar, Sujawal, Badin, Khairpur and Sukkur districts of Sindh and Charsadda, Swat and Nowshera districts of KP Province will reduce reliance on traditional energy sources, contributing to a decrease in carbon emissions. Climate Resilience: Climate-resilient infrastructure will be established, minimising the environmental impact of future floods, and enhancing the overall sustainability of the water supply systems. **Negative Impacts** Construction Impact: The construction phase may result in temporary habitat disruption and soil erosion, requiring mitigation measures to minimise environmental degradation. **SOCIAL IMPACTS** **Positive Impacts** Improved Access to Clean Water: The project will significantly enhance access to clean water for communities in flood-affected areas, promoting public health and human security. Community Empowerment: Training of WASH committees and local technicians will empower communities to manage and maintain the water supply infrastructure independently and gender-transformative components will increase the number of women and their meaningful participation in the community-level activities. **Negative Impacts** Construction Impacts: Temporary earth moving and boring may occur, necessitating the mitigative measures. **ECONOMIC IMPACT** **Positive Impacts** Job Creation: The construction and maintenance phases will generate employment opportunities, benefiting local economies. **Negative Impacts** Construction Costs: Initial construction costs may strain the project budget, requiring careful financial planning. **HEALTH AND SAFETY IMPACTS** **Positive Impacts** Improved Health Conditions: Access to clean water will reduce waterborne diseases, positively impacting public health. **Negative Impacts** Safety Risks during Construction: Construction activities pose safety risks, requiring strict adherence to safety protocols to prevent accidents.
Output 4.2: NbS for sewage treatment demonstrated through constructed wetlands along with proper management structures and adequate capacity for operation and maintenance of wetlands. Activity 4.2.1: Install constructed wetlands in eight selected sites benefiting 22,400 people in the Charsadda, Swat and Nowshera districts of KP Province and Sukkur	**ENVIRONMENTAL IMPACTS** **Positive Impacts** Ecosystem Restoration: The installation of wetlands contributes to the restoration of local ecosystems. Furthermore, Diverse flora and fauna habitats are created, enhancing biodiversity. Water Quality Improvement: Wetlands act as natural filters, improving water quality by reducing pollutants Meanwhile, downstream ecosystems benefit from reduced urban effluent. **Negative Impacts** Temporary Disruption: Construction activities may temporarily disrupt local habitats. Mitigation measures, such as phased construction, will be implemented to minimise disturbance.

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Project Output and Activities under Category B	E&S Impact Analysis
and Khairpur districts of Sindh Province based on proven UNICEF methodology, reducing urban effluent, and increasing water availability. Activity 4.2.2: Strengthen existing government and community structures to operate and maintain the wetlands. Activity 4.2.3: Provide technical support, innovative and lateral learning platform, and equipment to service providers unable to operate Sewage Treatment Plants (STPs).	**SOCIAL IMPACTS** **Positive Impacts** Improved Water Access: Enhanced public health and human security through increased access to clean water. Community empowerment through participation in project activities. Community Empowerment: Strengthening government and community structures empowers local communities. Enhanced community involvement in the operation and maintenance of wetlands. Capacity Building: Technical support enhances the capabilities of service providers in sewage treatment. Learning platforms promote continuous improvement and innovation. **Negative Impacts** Displacement during Construction: Temporary disturbance due to earth moving may occur during construction, requiring adherence to ESMP. **ECONOMIC IMPACTS** **Positive Impacts** Job Creation: Generation of employment opportunities during construction and maintenance phases. Strengthening of local service providers through technical support and learning platforms. Economic Diversification: Increased economic opportunities for service providers to operate STPs. **Negative Impacts** Construction Cost: Initial high construction costs may strain the project budget. **HEALTH AND SAFETY IMPACTS** **Positive Impacts** Reduction in waterborne diseases through improved sewage treatment. Enhanced community health and well-being. **Negative Impacts** Potential safety risks to workers and surrounding communities during construction.
Output 5.2: 15 selected waterways/ponds in Sindh Province restored/rehabilitated, including installation of water quality monitoring systems and establishing and strengthening operation, maintenance, and management structures. Activity 5.2.1: Restore/rehabilitate selected natural waterways in the Sujawal, Umerkot, Sanghar, and Tharparkar districts of Sindh. Activity 5.2.2: Install automatic water quality monitoring systems to ensure real-time monitoring in the target catchment location. Activity 5.2.3: Construct/upgrade 15 communal ponds benefiting 30,000 people in the Umerkot, Sanghar, Sujawal and Tharparkar districts of Sindh. Activity 5.2.4: Establish communal pond management committees will	**ENVIRONMENT IMPACTS** **Positive Impacts** Water Conservation: Restoration/rehabilitation of natural waterways and ponds contributes to water conservation. Improved water availability for communities and ecosystems. Water Quality Monitoring: Automatic water quality monitoring systems ensure real-time assessment. Timely response to water quality issues, preventing adverse impacts on communities. **Negative Impacts** Construction Impact: Temporary habitat disruption during restoration activities. Potential soil erosion in construction areas. **SOCIAL IMPACTS** **Positive Impacts** Community Empowerment: The establishment of communal pond management committees empowers local communities. Increased community capacity for the operation and maintenance of water sources. Climate Adaptation: Pilot project for communal pond management committees promotes climate adaptation. Ensures water supply during unpredictable drought conditions. **Negative Impacts** Temporary Disruption: Construction activities may temporarily disrupt local habitats. Mitigation measures, such as phased construction, will be implemented to minimise disturbance. **ECONOMIC IMPACTS** **Positive Impacts**

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Project Output and Activities under Category B	E&S Impact Analysis
be implemented as a pilot project to promote climate adaptation by communities to ensure water supply during drought which is becoming more and more unpredictable due to ongoing climate change.	Job Creation: Generation of employment opportunities during restoration and construction phases. Strengthening of local service providers through technical support and learning platforms. Economic Diversification: Increased economic opportunities for communities through improved water availability. Enhanced community resilience to climate-related challenges. **Negative Impacts** Construction Costs: Initial high construction costs may strain the project budget.

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5. Environmental and Social Management Plan

The E&S Management Plan (ESMP) describes the management process that will be put in place to ensure that the project activities, especially USPs, are managed in a way that it remains consistent with the national and subnational environmental regulations. It also summarises the risk mitigation measures that have been built into the project to ensure compliance with the environmental laws and regulations applicable to it in Pakistan or more specifically to the provinces.

Following an analysis of the potential risks and impact assessment of project activities falling under Category B, the output specific mitigative/corrective measures to be put in place to avoid or reduce potential environmental and social risks are presented below.

Project Outputs	E&S Parameters / Impacts	Targets to be Achieved	Mitigation / Preventive Action	Responsibilities		
				Implementation	Supervision	Monitoring
USPs All USPs are under Outputs 2.2, 3.2, 4.2 and 5.2; hence, the generic E&S management measures are proposed for these outputs in the rows below. The USP specific management planning will be undertake at the Inception Stage.	Though preliminary ESA of USPs has been conducted, a thorough ESA for each of ESA is required prior to implementation to identify specific E&S risks and impacts and management planning to be undertaken to mitigate any potential impacts.	• Identification of risk and impacts of the USPs after the precise geography and scope of USPs is defined during implementation of the project. • Compliance of USPs with AF ESP and national/sub-national environmental legislation	• Undertake applicable ESA for each USP and seek environmental approval, if needed, from the relevant national or sub-national Environmental Protection Agency. • Develop USPs specific ESMP and communicate the same to the Contractor/EE/community in coordination with Project staff. • Monitor and report implementation of ESMP.	During inception phase by the E&S Focal Person Environmental approval, if needed, by relevant EPA	Project Manager	E&S Focal Person Relevant EPA
Output 2.2: Recharge measures (for improved springshed practices, land use planning, and bioengineering) co-developed and implemented. Output 3.2: Climate-smart and resilient water supply infrastructure established in selected sites, along with	Air Quality Dust resulting from construction work. Use of heavy machinery can generate exhaust and dust emissions. Smoke from burning of waste materials or burning of firewood in the labour camp	• Compliance with prescribed local/provincial environmental quality standards such as to control air pollution	• Necessary measures like sprinkling of water regularly, especially during dry climatic conditions should be taken to limit pollution from dust and other windblown materials. • Periodic maintenance and management of all the construction machinery and vehicles • Cutting and burning shrubs for fuel will be prohibited. Instead, gas cylinders should be used in the labour camp for cooking purposes. Similarly, waste burning will not be allowed.	During construction phase by the Contractor/EE/community in coordination with Project staff During O&M phase by the community	Project Manager	E&S Focal Person Relevant EPA
	Water Quality Run-off water from the construction area Drainage of wastewater on the ground can	• Control of groundwater water pollution from construction activities	• Use of spill prevention trays and impermeable sheets to avoid contamination of the groundwater water.	During construction phase by the Contractor/EE/community in	Project Manager	E&S Focal Person Relevant EPA

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Project Outputs	E&S Parameters / Impacts	Targets to be Achieved	Mitigation / Preventive Action	Responsibilities		
				Implementation	Supervision	Monitoring
contextually relevant management structures with adequate capacity for operation and maintenance of the community infrastructure. Output 4.2: NbS for sewage treatment demonstrated through constructed wetlands along with proper management structures and adequate capacity for operation and maintenance of wetlands. Output 5.2: 15 selected waterways/ponds in Sindh Province restored/rehabilitated, including installation of water quality monitoring systems and establishing and strengthening operation, maintenance, and management structures.	contaminate the soil and groundwater. Inappropriate disposal of waste. Open sewerage water disposal on land can contaminate groundwater and cause proliferation of mosquitoes/dengue and various other insects in the area. Leakage of oil and chemical materials from construction activity		• Furthermore, septic tanks will need to be constructed which will be cemented to prevent groundwater contamination. • Proper disposal of waste material on dumping sites to avoid leachate generation and contamination of groundwater/surface water. • Prohibit illegal dumping of waste. • The contractor will repair / replace/compensate for any damages caused by the Construction activities to the drinking water source/s.	coordination with Project staff During O&M phase by the community		
	Waste Generation Construction waste from construction activities Domestic waste from worker's camp Hazardous waste such as dry batteries, chemicals, paints, etc.	• Proper and safe handling and disposal of construction-related waste • Compliance with applicable waste management rules for hazardous and non-hazardous waste disposal • Implementation of waste management plan	• Ensure prevention of inappropriate disposal of waste material • Conduct separate collection of construction and domestic waste to promote recycling and re-use. • Dispose of non-recyclable and hazardous waste material properly according to waste management rules • Proper disposal of waste on the agreed site as per agreed method. The area is to be levelled and contoured after disposing of excess material. • No waste or debris will be thrown in the nearest canal water or other water bodies. • Contractor will prepare waste management plan related to construction activities; get its approval from site engineer and ensure its full implementation	During construction phase by the Contractor/EE/community in coordination with Project staff During O&M phase by the community	Project Manager	E&S Focal Person Relevant EPA
	Noise Noise caused by construction machinery and vehicles used for the mobilisation of	• Compliance with Prescribed local environmental quality standards to	• The contractor will strictly follow the locally prescribed environmental quality standards for ambient noise.	During construction phase by the Contractor/EE/community in	Project Manager	E&S Focal Person Relevant EPA

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Project Outputs	E&S Parameters / Impacts	Targets to be Achieved	Mitigation / Preventive Action	Responsibilities		
				Implementation	Supervision	Monitoring
	construction equipment and workers	control Noise pollution	• Control noise through control of working hours and selection of less noisy equipment. • Prohibit the use of pressure horns. • Provision of acoustic enclosures (hood and shrouds) on the generator. • Proper maintenance of vehicles and construction equipment. • Minimise/avoid unnecessary use of pneumatic drills and other noisy machinery. • Personal protective equipment (PPE) will be provided to the construction workers and its usage will be made mandatory.	coordination with Project staff During O&M phase by the community		
	Materials Management	• Safe and secure environment for construction workers	• Stockpiles shall not be situated such that they obstruct natural water pathways. • Stockpiles shall not exceed 2m in height unless permitted by Concerned Engineer on site. • Hazardous substances/materials are to be transported in sealed containers or bags	During construction phase by the Contractor/EE/community in coordination with Project staff During O&M phase by the community	Project Manager	E&S Focal Person Relevant EPA
	Socioeconomic Impacts	• Communities have a sense of ownership of the project activities and implementation. • The project activities are conflict-sensitive and foster social cohesion, ensuring that the implementation does not create or exacerbate	• Community engagement will be prioritised prior to any activities in the target areas for ensuring that the construction and the staff have the acceptance of the communities. • Contractors' activities and movement of staff to be restricted to designated construction areas as agreed with the community. • The conduct of the construction staff when dealing with the public or other stakeholders shall be in a manner that is polite and courteous all the time.	During construction phase by the Contractor/EE/community in coordination with Project staff During O&M phase by the community	Project Manager	E&S Focal Person Relevant EPA

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Project Outputs	E&S Parameters / Impacts	Targets to be Achieved	Mitigation / Preventive Action	Responsibilities		
				Implementation	Supervision	Monitoring
		competition of grievances within the communities. • Livelihood and entrepreneurial opportunities for the communities, especially for the women and the youth have expanded as a result of skills and capacity building.	• The contractors and the staff are sensitised and trained on issues of Do-No-Harm and conflict-sensitivity in order to stay vigilant on any negative impacts within the community. • Construction site shall be well guarded and lighted, and lighting on the construction site shall be pointed downwards and away from oncoming traffic.			

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Annex 4: Grievance Redressal Mechanism

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1. Purpose and Scope

The Project is committed to promoting gender inclusivity and ensuring the active participation of community members in the decision-making processes. In this context, a robust grievance redressal mechanism (GRM) is essential to address concerns, complaints, and grievances that may arise during the project. This grievance mechanism is designed to provide a transparent and accessible platform for all stakeholders, with a special focus on gender inclusivity. The objectives of this mechanism are:

- To establish a transparent and responsive grievance mechanism that ensures the meaningful participation of all community members, regardless of gender.
- To address and resolve grievances in a fair, timely, and equitable manner.
- To use the grievances and feedback received as an opportunity for continuous improvement in project implementation.

1.1. Guiding Principles

- **Gender Inclusivity:** The grievance mechanism will be open and accessible to all community members, ensuring equitable representation and participation of women, men, and marginalised groups.
- **Transparency and Responsiveness:** All grievance-related information, procedures, and outcomes will be made available to the community, ensuring a high level of transparency in the process. All reports and allegations are taken seriously – grievances will be promptly and thoroughly reviewed, as described herein.
- **Accessibility:** The mechanism and reporting channels will be accessible and available to stakeholders, communities, and groups. It will provide multiple methods for reporting, considering language and technology challenges.
- **Accountability:** The project team will be held accountable for addressing and resolving grievances promptly and effectively.
- **Non-Retaliation:** All individuals who submit grievances will be protected against retaliation and will not face negative consequences for their participation.

2. GRM for SAFER Pakistan Project

The Project will follow a well-structured GRM in line with the guidance provided by the Adaptation Fund.[35] Accordingly, a two-step GRM will be put in place for the project beneficiaries or any other stakeholder to register their complaints about the project implementation and seek resolution thereof. These GRM routes will be widely publicised to the relevant stakeholders, including the beneficiary communities, during the project implementation.

AF recommends the complainants and implementing entities to use the implementing entity's GRM as a first step. In case, the Parties fail to reach a mutually satisfactory solution through the implementing entities' grievance mechanism within a year, the complainant can directly use the Ad hoc Complaint Handing Mechanism (ACHM) of the Adaptation Fund.

2.1. ICIMOD's (RIE) Grievance Redressal Mechanism

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ICIMOD's Environmental and Social Safeguards Policy (2020) explains that a detailed grievance reporting and redressal mechanism exists through which complaints can be easily lodged and resolution provided for reported concerns or grievances.

2.1.1. Receiving and Assessing Grievances

The grievances regarding the SAFER Pakistan project can be filed by any individual, community, or group that believes it is or may be negatively affected by the project. The complaint can directly be filed at scu@icimod.org in English or Urdu and should include the following information:

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- **Name, title, addresses and contact details** (phone, fax, email address, etc.) of the complainant and representative(s) if appointed. If representative(s) submits a complaint, s/he must attach to the complaint written evidence that s/he is authorised to act on behalf of the people submitting the complaint, and whom s/he is representing.
- **Confidentiality:** whether the complainant and/or representative(s) request confidentiality.
- **Information relevant to the project concerned:** title, location, sector, and description of the project.

[35] Adaptation Fund: Ad Hoc Complaint Handling Mechanism (https://www.adaptation-fund.org/projects-programmes/accountability-complaints/ad-hoc-complaint-handling-mechanism-achm/).

- **Adverse impacts/harm:** A description of project activities believed to be the actual or potential source of the harm and nature of the harm attributed to those activities; and
- **Description of efforts taken to resolve the complaint** through the implementing entity's grievance mechanism and of failure to reach a mutually satisfactory solution through the mechanism within a year.

Alternately, the complainant can call at +977-01-5275223 to register the complaint regarding the SAFER Pakistan project. A dedicated ICIMOD staff will listen and register the complaint and revert back to the complainant with the management response on the complaint.

2.1.2. Addressing and Closing Grievance

Once the ICIMOD Board Secretariat receives the compliant, and has determined that the grievance is eligible, it will assign an appropriate lead to coordinate the activities to address the matter, with technical support as needed. The lead will be someone with the appropriate capacity and knowledge to manage the grievance. Based on the Assessment Report, which will be shared with the parties for comments, A Dispute Resolution Strategy (DRS) will be prepared. The project team will work with affected individuals to implement DRS and will submit Update Reports to the ICIMOD Board Secretariat. After the grievance has been resolved satisfactory, the Secretariat will prepare and Final Resolution Report (FRR) and see parties' comments on it. Then the FRR will be submitted to the ICIMOD Board. After Board's approval, the same will be disclosed on ICIMOD's website along with any other relevant documents. The GRM process with timelines is shown in Figure 12.

Figure 12: ICIMOD's GRM Process

2.2. AF's Ad hoc Complaint Handing Mechanism

In case the complaint about implementation or adverse effects of the SAFER Pakistan project has not been satisfactorily addressed by ICIMOD within a period of one year, the complainant can file a complaint to the Adaptation Fund. The AF Board Secretariat independently manages all aspects related to the ACHM, under the oversight of the Ethics and Finance Committee (EFC) of the Board. Following is the AF's GRM as extracted from AF's webpage (https://www.adaptation-fund.org/projects-programmes/accountability-complaints/ad-hoc-complaint-handling-mechanism-achm/).

2.2.1. Format

No specific form/format is required, but a complaint must be submitted in writing in any UN language (Arabic, Chinese, English, French, Russian or Spanish) either:

- By email to afcomplaints@adaptation-fund.org, or
- By hard copy to the Adaptation Fund Board Secretariat, 1818 H Street NW, N7-700, Washington, DC 20433, USA.

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2.2.2. Standing

Any individual or group of two or more people who lives in the SAFER Pakistan project area and believe they are adversely affected by the implementation of the project, or their duly appointed representative can submit a written complaint to the ACHM.

2.2.3. Time of submission

Complaints can be sent up to the date of the submission of the final evaluation report of the SAFER Pakistan project.

2.2.4. Eligible claim

An eligible claim should meet the three basic criteria as follows:

1. Complainants living in the SAFER Pakistan project area believe they are adversely affected by the implementation of SAFER Pakistan project.
2. Complaint is related to adverse impacts of the SAFER Pakistan project; and
3. Complaint is submitted no later than the date of submission of the final evaluation report of the SAFER Pakistan project.

Frivolous, malicious, or vexatious complaints and complaints related to activities that have no relevance to the SAFER Pakistan project are not eligible.

2.2.5. Confidentiality

If complainants or their representative(s) believe that there may be a present or future risk of retaliation for raising their concerns, they can request confidentiality of their identifying information in a written complaint or in a writing at any time throughout the process.

2.2.6. Required Contents of a Written Compliant

- **Name, title, addresses and contact details** (phone, fax, email address, etc.) of the complainant and representative(s) if appointed. If representative(s) submits a complaint, s/he must attach to the complaint written evidence that s/he is authorised to act on behalf of the people submitting the complaint, and whom s/he is representing.
- **Confidentiality:** whether the complainant and/or representative(s) request confidentiality.
- **Information relevant to the project concerned:** title, location, sector, and description of the project.
- **Adverse impacts/harm:** A description of project activities believed to be the actual or potential source of the harm and nature of the harm attributed to those activities; and
- **Description of efforts taken to resolve the complaint** through the implementing entity's grievance mechanism and of failure to reach a mutually satisfactory solution through the mechanism within a year.

2.2.7. ACHM Process

The ACHM process may start after the complainants and the implementing entity have used the entity's grievance mechanism and failed to reach a solution within a year. The process may be discontinued at any stage should a solution be found, or the case be closed for other reasons.

The ACHM process is summarised below (Figure 13) with the timelines of various steps.

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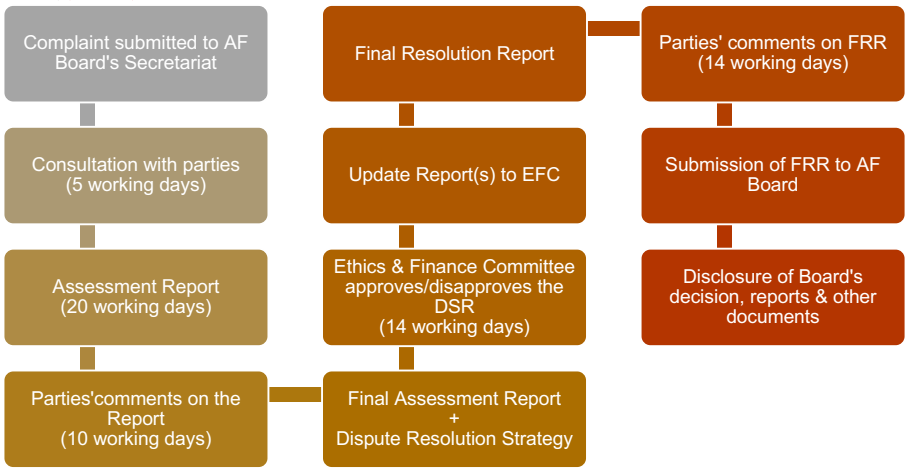
Figure 13: ACHM Process



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Annex 5: Gender Assessment and Action Plan

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This annex provides a comprehensive Gender Assessment and Action Plan for the SAFER project that comply with the Adaptation Fund's (AF) Environment and Social Policy (ESP) and Gender Policy. The Assessment entails identifying the factors that influence gender responsiveness in climate change in Pakistan and determining how the proposed programme activities will address gender disparities. The assessment encompasses a literature review, incorporating findings of stakeholder consultations in the field done in November 2023, and an evaluation of the project activities' gender responsiveness.

The Gender Assessment and its findings were used to develop a Gender Action Plan (GAP) that outlines specific actions and strategies to address gender concerns and promote gender equality throughout the project lifecycle.

1. Gender Assessment

1.1. Purpose

The purpose of the assessment was to identify key gender issues that may be exacerbated by climate variability and change, particularly hydromet hazardous events like floods and droughts in the programme context, in the River Indus in Pakistan. The assessment I focused? on gender-disaggregated socioeconomic and cultural data for Pakistan, with a particular emphasis on climate-dependent sectors around River Indus. It established? a gender baseline, outlining gender disparities, examining gender-differentiated impacts and risks, and identified opportunities to proactively address gender gaps influenced by intersectional socioeconomic and political factors within the programme.

1.2. Methodology

The Gender Assessment forms the foundation for developing the GAP presented below. The following methodology was used to prepare the Gender Assessment.

1.2.1. Literature Review

A review of relevant national legislation pertaining to gender issues, an extensive review of available research on gender and climate in Pakistan, and other comprehensive gender and climate-related reports at both national and regional reports were conducted to gain an understanding of the gender considerations relevant to the activities and scope of the project. The pervasive and diverse interactions between the gender norms , performances and the intricate interaction of climate change and security were thoroughly explored. Recognizing and comprehending these interactions is crucial for anticipating and mitigating potential risks. The assessment was carried out using a multidisciplinary approach, drawing from fields such as geography, gender studies, development, peace, and humanitarian action.

1.2.2. Field Consultations

The Gender Assessment was carried out in conjunction with UN Women's Gender and Climate Security Assessment in November 2023. The field consultations of the assessment were conducted to understand the needs of the communities vis-à-vis climate change, particularly hydromet hazardous events like floods and droughts in the programme context River Indus in Pakistan. The perspectives of the women were considered in characterizing potential gender-related impacts of the programme. Survey questionnaires as well as interviews were administered for the field consultations.

The absence of credible gender and climate data presents a significant challenge in analysing climate change sectors in Pakistan. Until 2022, there has been no unified baseline of data sets available, National Gender Data portal, supported by UN Women, The situation changed with the launch of the National Gender Data portal supported by UN Women aimed at consolidating all official gender-related data under one platform., However, relying on dated statistics must be relied upon to conceive a picture of climate stress. The gaps in data have been partially filled by UN agencies, leveraging Multiple Indicator Cluster Surveys that highlight the resilience of households, and these too will benefit by the inclusion of climate specific indicators. Gendered statistics, where available, do not go beyond labour force enumerations in official statistics, and only allow an inference of climate stress through matching indices in the Pakistan Social and Living Standard Measurement (PSLM) against environmental conditions in select geographical locations and time periods. This makes climate action almost entirely dependent on approximations.

1.3. Gender Assessment

Despite significant advancements in human development, gender inequality poses constraints on overall social, political, and economic development in Pakistan. As highlighted in the 2022 Global Gender Gap Report by the World Economic Forum, Pakistan is positioned at 145 out of 146 countries globally.

The impacts of climate change affect men and women differently as their roles differ in the society and both have distinct capabilities as agents for change toward effective adaptation and mitigation. It further disproportionately impacts the poor, individuals dependent on natural resources for their livelihoods, making them more vulnerable to natural disasters and extreme weather events... It has been observed that climate change can **increase existing gender inequalities by**

aggravating the vulnerability and adaptability of women to face climate change impacts, encountering heightened risks of livelihood insecurity, poor health/education outcomes, and threats to personal safety, including gender-based violence. Gender inequality amplifies vulnerability as women often find themselves excluded from decision-making processes on matters directly impacting their lives. Social biases and cultural norms further limit women's opportunities to engage in and contribute to the planning and execution of climate change responses, thus hindering their potential as agents of positive change. Gender-based inequalities in terms of income, assets, decision-making power, technology and access to land, water and resources further exacerbate the effects that climate change has on the lives of women and girls.

Research and programmatic evidence have shown that societal and cultural power structures, often reinforced by legal and policy frameworks, have significant **impacts on how different groups of women and men experience and respond** to climate change. In times of drought, stress on water supplies increase the time women spent on this task, therefore limiting their availability to participate in educational opportunities or income-generating activities for example.

At the same time, this necessitates to take into consideration that women are often first responders in disasters and humanitarian crises and, due to their unique knowledge of and position within communities and the environment, and **often play critical roles in first crisis response and recovery.** Women are extensively involved in some of key sectors as full-time labour or secondary workers in addition to their dependence on natural environments for sustenance. They are also closely engaged in the preservation, conservation, and protection of fragile ecosystems, which are under threat from climate change and poor policy choices. Capitalizing on their strengths and building upon their capacities is necessary as much as providing them the instruments to safeguard themselves and their communities from predicaments caused by policy neglect or degradation of the environment they depend on. There is also **increasing evidence that women's leadership and participation are critical**. Recognizing the significance of women's contributions is essential, particularly in building resilient social support systems that can effectively counteract the impacts of violence, stress, and anxiety. There is a need to support women's organisations and groups to develop social support networks at the local level. By doing so, not only are the individual well-being and resilience of women get enhanced, but it also contributes to the broader societal change and sustainable development.

Further, given that women play vital roles in care work, dominate the informal sector, and actively shape essential services, these inequalities ultimately undermine the resilience of households, communities, and societies. **Left unaddressed, these inequalities will continue to compromise critical efforts towards social adaptation and a gender-just transition to climate change.** This is also true in Pakistan where studies shows that Pakistan's women are further disadvantaged when faced with climate crises. Gender inequality and gender norms continue to be major drivers of attitudes and behaviours, and therefore, it is essential to understand communities and particularly women current perceptions and coping tools with regards to climate change.

1.3.1. Normative Environment: Gender in Pakistan Climate Policies and Sectoral Plans

As a signatory of the Paris Agreement, Pakistan is committed to gender equality and coherent governmental response to climate change. A detailed review of Pakistan's climate related policies and frameworks reveals that **amid gender-responsive national policies, many sectors need further guidance by gender sensitive frameworks,** especially with respect to women's differentiated burdens in climate stress but also their unique role in climate adaptation especially in the community level.

Pakistan's approach to climate change is currently guided by the 2021 National Climate Change Policy (NCCP), which articulates a specific objective: "To integrate climate change considerations into economically and socially vulnerable sectors of the economy, steering Pakistan toward development that is compatible with climate sustainability." The policy further recognizes the imperative of reducing the gender gap as a fundamental step in enhancing climate preparedness and resilience for all. Emphasizing the pivotal role of women, it underscores the critical importance of ensuring the active participation of women and gender experts in all aspects of policies, initiatives, and decisions related to climate action. Pakistan's Second National Communication on Climate Change to the UNFCCC (2018) stresses that "Pakistan fully recognizes that women are powerful agents of change. It is, therefore, vital to ensure participation of women and female gender experts in all policies, initiatives and decisions relating to climate change. To address the gender aspects of vulnerability from climate change, the government in collaboration with other relevant entities needs to take strategic measures." The Framework for Implementation of Climate Change Policy (2014-2030) mentions about gender integration in various efforts to address climate change", but it does not include explicit mention of gender or women in the proposed actions within the framework.

MoCC&EC, through a Gender Readiness Grant from the GCF, has developed a **Climate Change Gender Action Plan (ccGAP)** in 2022. The ccGAP aims to integrate gender and climate fully in key sectors of the economy, particularly agriculture and food security, water and sanitation, disaster risk management, forests and biodiversity, coastal management, energy, and transportation. The ccGAP is a tool to enhance knowledge and capacities, identify gaps and enabling conditions, and build coordination and actions to strengthen gender-responsive strategies and results to meet the country's climate change objectives. However, such steps have not yet transformed into adaptation and resilience. Despite

these progressive steps in policymaking, Pakistan continues to be consistently ranked one of the most vulnerable and least adapted countries to climate change.

Pakistan's climate change framework (Climate Act) highlights gender related concerns well. Women's role in managing natural resources, nurturing communities, and addressing vulnerabilities during climate stress and crises are routinely emphasized in climate policy documents. Pakistan has made commendable efforts towards gender and social inclusion through programmes like Ten Billion Tree Tsunami Programme (TBTTP), REDD+ (Reduced Emissions from Deforestation and forest Degradation), GLOF-II (Glacial Lake Outburst Floods), Pakistan Snow Leopard and Ecosystem Protection Program (PSLEP), and Chilgoza Restoration Project. In addition, the Green Stimulus package has created jobs, including for women, for setting up nurseries, orchards, agricultural forestry, fisheries, horticulture, eco- tourism, wildlife area management and developing small and medium-sized enterprises (SMEs) through forestry operations and protected area management. Various consultations have been held to mobilize wider society for climate action and to ensure that vulnerable segments of the society, particularly the girls and women, are included in the climate policies and strategies as a part of the 'Whole-of-government' approach. The most recent such effort was 'COP in My City 2023' that mobilized and capacitate young women and men towards promoting youth-led climate actions organized with support of UN Women, UNICEF, and UNDP.

National Disaster Response Plan (2019): Pakistan's national disaster response policies have evolved over the years, with the most recent one providing a contemporary framework that addresses the distinct needs of men and women during disasters. The National Disaster Response Plan **explicitly acknowledges gender differences at the outset**, emphasizing that humanitarian responses are far more effective when they consider the needs, agency, vulnerability, and coping strategies of conflict-affected individuals, including women, men, girls, boys, and children. The policy advocates for upholding human dignity in disasters and ensuring equal access to humanitarian assistance and protection. Notably, the National Disaster Response Plan is the only policy reviewed in this research that explicitly mentions individuals with disabilities and outlines ways in which they can contribute to humanitarian efforts in the aftermath of disasters. From a gender perspective, this policy framework **effectively promotes gender equity and reflects a degree of institutional progress that fosters the adaptive competence of planners and implementers.** Compared to other policy areas, the disaster response framework exhibits a more streamlined and proactive institutional approach.

Resilient Recovery, Rehabilitation, and Reconstruction Framework (4RF, 2022). In response to the 2022 floods, the Resilient Recovery, Rehabilitation, and Reconstruction Framework (4RF) is the Government of Pakistan's strategic policy and prioritisation document, which is guiding the recovery, rehabilitation, and reconstruction of the country. It provides programmatic priorities, policy framework, institutional arrangements, financing strategy, and implementation arrangements. The 4RF takes a long-term perspective to climate resilience while also addressing the immediate reconstruction needs. The Strategic Recovery Objective 3 of the framework emphasizes that Pakistan's high exposure to multiple natural hazards and accelerated **climate change, should be seen in the context of its social vulnerability.** It acknowledges that in the wake of the 2022 disastrous floods, the need for social protection measures and emergency support services for vulnerable groups has magnified and the vulnerable sections of the population have encountered specific difficulties stem from loss of documentation, harmful/inequitable social norms, negative coping strategies, inadequate infra- structure, and weak assistance capacity to deal with specific needs. Therefore, the 4RF envisions pro-poor, pro-vulnerable and gender-sensitive recovery and reconstruction.

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National Water Policy (2018). Pakistan's National Water Policy (2018) establishes a federal framework that allows provinces to develop their own water management plans. While the policy designates water resources as a "national responsibility", irrigation, agriculture, urban and rural water management, and other related matters fall under the purview of individual provinces. Among Pakistan's water policies, only Gilgit-Baltistan's explicitly acknowledges the sector's gender-differentiated needs. Most other policies focus on technical and administrative interventions to address water sector challenges, **with little to no consideration for human vulnerability. When women are mentioned in these policies, their role is often limited to managing domestic water** hygiene, reinforcing traditional gender stereotypes. The National Water Policy asserts that "people are the prime stakeholders of the water sector" and that all measures should be directed towards their well-being and interests. It also emphasizes the importance of citizen participation in "performance, operation, and ownership of water assets" to achieve this goal. In this regard, the policy promotes a people-centric approach that could benefit from further elaboration and a stronger focus on vulnerable groups, particularly women's challenges.

Several **structural constraints continue to hold back women's full participation in mitigation and adaptation realms.** This large portfolio of policy frameworks mentioned above needs an overall strategy to quantify inputs, outputs and outcomes at project and portfolio levels, an exercise expected to be an integral part of ccGAP to develop an integrated strategy and define sectoral targets for Pakistan. The National Commission on the Status of Women (NCSW) is a statutory body that was established in 2000 as an outcome of the national and international contributions of the Government of Pakistan. The Commission serves as the lead agency to mainstream gender. All provinces have also established their provincial commissions and several provinces have developed their gender policies or action plans under the umbrella of NCSW. However, climate impacts and women's role in climate mitigation and adaptation in urban and rural contexts still requires further embedding of NCSW's work. Since lack of economic empowerment prevents Pakistani women from

adapting to the climate change impacts, it is fundamentally important to identify climate risks and specific needs of girls and women to respond to climate change challenges.

1.3.2. Socioeconomic environment: differentiated climate change and crisis impacts on women.

Agriculture sector and gendered disparities. Pakistan's predominantly agrarian economy is the main employer of labour across the country and determines the demographics of rural Pakistan to a large extent. **Between 65-70 percentage of the population in Pakistan is directly or indirectly dependent on natural resource-based livelihoods** and the state has always prioritized ground-water intensive agriculture as the mode of economic growth. The agriculture sector employs approximately 42 percentage of the population and provides livelihoods to 62 percentage of the population. One of the main challenges of **the agricultural sector in Pakistan is that it draws 90 percentage of its water from the River Indus** for irrigation and thus remains highly sensitive to changes in the river flows. This marks Pakistan as one of the fifteen most water stressed countries in the world. Pakistan has one of the world's largest contiguous irrigation systems fed by glacial and snow melt, as well as monsoon rains that recharge the Indus River System and its tributaries. The reasons for this accelerated stress are well documented: population explosion, rapid rate of urbanisation, water intensive agriculture and industrialisation.

Gender in agriculture and water sector is marked by numerous disparities. This is often the consequence of the social and cultural norms in the communities. **9.1 million women agricultural workers** play a substantial role in food production and food security, but they are largely unpaid, suffer from greater time poverty, and are far more vulnerable to exploitation than men. Women's ownership of land, and control over physical assets is minimal: only 2 percentage of women report owning a house or agricultural land as compared to 72 percentage men. Women in agriculture in Pakistan work an average of 15.5 hours per day. **Only 19 percentage are paid for their labour and 60 percentage work as unpaid workers on their families' landholdings.** They are considered 'contributing family members' and their labour is valued (using 27 comparative median wages) at PKR 683 billion, or 2.6 percentage of GDP. Climate degradation adds to their challenges, including pressures to manage households single-handedly in case of male out-migration, or poor yields from subsistence farming or vegetable gardening on account of shifting weather patterns. They face discrimination and harassment in negotiating prices for farming inputs, as well as selling produce at a profit. **Women's triple burden makes them overworked and vulnerable to exploitation,** as they have little agency to overturn unequal divisions of labour.

Depleted water resources, drought, and desertification, which lead to resource scarcity, also disproportionately affect women in both urban and rural contexts. When faced to climate extremes such as floods and droughts, factors such as social exclusion, **lack of equal access to resources and lack of mobility disproportionately affect women.** For example, in Sindh, water scarcity is a major challenge, with more than 30 percentage households accessing water from unsafe sources; this can go as high as 42 percentage in districts with extreme water scarcity. For as many as 70 percentage households, water is not available from the source, or is too expensive. In rural Sindh, 60 percentage **women are involved in collecting drinking water and more than 50 percentage of women spend between 1-3 hours fetching it.** When water sources dry up or become unserviceable, women are forced to walk longer distances in search of new freshwater sources. Global estimates hold that women and girls spend an estimated 200 million hours combined every day fetching water; and in Pakistan this translates to 1260 hours a year, or the equivalent of more than 50 days searching for water sources, which become further out of reach in areas with acute climate stress.

Moreover, water stress usually **brings about a discontinuation of hygienic practices** that prevent several diseases. Women in such households are more likely to consume and utilize contaminated water, especially if they have **reduced mobility on account of ill health, pregnancy, or cultural barriers.** Men have a lesser chance of consuming contaminated water, as they have greater mobility for work outside homes and communities. In times of food and water scarcity, women prioritize their family's needs over their own and show signs of higher malnutrition.

Disaster Management and mitigation and gendered disparities. The policy sector of disaster management has received considerable attention in Pakistan due to the frequency of natural disasters and their devastating impacts on the population. The NDMA's data shows that since the 2005 earthquake, natural disasters have resulted in over 80,000 deaths, 200,000 injuries and destruction of over 4 million houses. The MoCC and NDMA are responsible for Pakistan's climate action externally (at international negotiations) and internally.

Experiences of climate disasters are **highly gendered. Evidence from around Pakistan suggests that women are more vulnerable to suffering casualties in disasters.** This is due to as women are l**ess likely to receive early warning signals** through telecommunication than men; in many instances women and girls **are not taught survival skills like swimming,** to rescue themselves or minors; and **cultural barriers prevent women from leaving their homes unattended** without permission of their male family members. Climate disasters are clearly exacerbating infrastructural failures in terms of public services in time of crises. Several studies quote **women's vulnerability to sexual and gender-based violence and lack of privacy at the relief camps**, in addition to insufficient medical-care to women amid their specific needs in pregnancy and delivery. The rehabilitation process also favours men over women, where men were provided resettlement compensation while women often lack adequate identification documentation. This was evident also in the most recent post-disaster assessment of the 2022 floods.

Women's 'triple burden' of productive, reproductive and community roles has come under a great deal of pressure with environmental degradation, and especially during natural disasters, when women's caregiving role for the family is critical to the household's survival. Moreover, the dependence of households on women increases manifold during disasters, with or without male family members. **Consequently, men and women are increasingly unable to live up to their prescribed roles, which have many impacts.** Studies have found several empirical examples of frustrated masculinities resulting in domestic or communal violence. For example, in 2014 in Rawalpindi, where communities reside along the banks of the Lai tributary, which not only presents a flood hazard but also makes them the main recipient of solid and liquid waste from upstream Islamabad, when the monsoon floods were particularly severe, there was reports of an increase in interpersonal violence. Reports explained intense anxieties around securing the home from damage and looting, keeping men, who are typically daily wage or contract workers, at home. This results in the loss of their job and income, exacerbating household insecurity. This is an assault to a man's masculinity, as by being protector of the physical infrastructure, he loses his ability to protect in other ways. Both women and men explained that this could lead to domestic violence.

At the same time, **women's agency, and unique ability to activate community networks, caring skills, and providing critical support to save lives during disasters** is often overlooked in the field of disaster management. Women can play a pivotal role in protecting children, caring for the elderly and safeguarding households and community assets in the event of a natural disaster, as well as providing post-care to the vulnerable in the same context. As seen in multiple disasters, women attempt to save the lives of their children or the elderly and protect key assets at the risk of their own lives.

A study of rural women showed that about 93% were able to perceive climate-related threats. Firstly, in terms of perceptions of the impacts: in a sample of 245 in Karachi, 73% reported that climate change was a reality, and it was negatively impacting their individual and family lives. Further, more females (79%) believed in climate change and its negative impacts compared to males (67%). Furthermore, participants reported that physical and psychological diseases have increased in line with this shift in weather. **Women adaptation strategies** included reduced buying of clothes, selling large livestock, seeking help from relatives, reduced proportion of meals, migrating to work for wages, and seeking support from district/local government. Women were much more likely to report an increased prevalence of physical and psychological violence.

2. Gender Action Plan

2.1. Project Objectives and Components

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The main objective of the programme is to reduce the vulnerability and increase the adaptive capacity of the population residing in the Pakistan's Indus Basin to respond to the impacts of climate change through improved community-based Monitoring and Early Warning Systems, resilient land use planning and increased water access. The impacts of increasing climate crises, which affect men and women differently, are continuously being experienced by the people, but its effects will increasingly impact infrastructure, health, water security, live and livelihoods of the population as well as the integrity of the Basin's ecosystems. The programme aims to address these multifaceted challenges by adopting a comprehensive approach that not only acknowledges the immediate impacts but also addresses the broader implications for the well-being and sustainability of the entire population in the Indus Basin. The proposed project has therefore been designed to address risk management and adaptation, through six components, as follows:

1. Cryosphere Risks: Melting glaciers, snowpack, and permafrost, which can lead to catastrophic floods, avalanches, and landslides in the upper basin.
2. Springshed Management: Springs vital for rural and urban water sources in the mid-hills of the basin are drying.
3. Groundwater Management and Resilience of Community Water Supply Services: Depleting groundwater and inadequate infrastructure in the middle basin plains hinder access to water. Unregulated groundwater uses and poor supply systems, damaged by floods and contamination, further impact domestic water services.
4. Ecosystem-based Solutions: Increased urbanization, droughts and floods have increased the urban effluent reaching the Indus, increasing pollution, and constraining access to clean water in the Middle and lower basin.
5. Surface Water Conservation: Unsustainable water use, and climate impact threaten the lower Basin. Community ponds for floodwater storage and restored waterways offer solutions.
6. Adaptive capacities and empowered communities for strengthened resilience: National and provincial institutions and Indus Basin's communities co-create and adopt innovative adaptation solutions (practices, tools, and technologies) and strategies (local and provincial development plans, and national and provincial policies and regulatory frameworks) for comprehensive climate resilience, building ownership and knowledge, and driving uptake beyond the project.

2.2. Gender-Responsive Measure Associated with Project Outputs/Activities – Gender Action Plan (GAP)

The project prioritizes gender-responsive measures to address the differentiated needs, while also promoting equitable participation, and equitable distribution of benefits, resources, and rights among women, youth, and men. Recognizing the varying vulnerabilities of these groups to climate change and extreme events like droughts and floods, the project focuses

on improving access and involvement of women and other marginalized groups in the management of Indus Basin water resources. fostering greater resilience among local communities. The Gender Assessment has informed in shaping a gender transformative approach to project implementation. This approach ensures that the benefits of the project are inclusive and contribute to the empowerment and resilience of all members of the community, regardless of gender or marginalized status.

- The project systematically integrates gender-related considerations through a range of strategies. The programme will: Adopt a human rights-centric approach as integral to all project components reflecting a commitment to social justice and equity throughout delivery.
- Ensure the participation and at least x% representation of women at all levels planning and decision making across all six components and in the project's governance and management structures.
- Strengthen coordination and promote institutionalisation to address gender issues.
- Integrate gender and support gender mainstreaming in all activities. This will require upholding and promoting gender equality as integral component with a focus on integrating gender-responsive strategies into both planning and implementation and ensuring equitable benefits for individuals engaged in all activities.
- Collect gender disaggregated data and establish a monitoring mechanism for tracking gender responsive outcomes/ progress during implementation through identification of specific gender related indicators.
- Promote use of practical measures including facilitating the application of new social technologies and gender-responsive approaches in consultation, co-developing processes, and capacity-strengthening activities, including establishing community watch groups, trainings and developing policies and strategies that are gender responsive.
- Focus on gender-responsive planning entailing the development of gender-responsive community contingency plans and risk mitigation and climate resilience community plans with leadership of women's groups.
- Develop a Gender-responsive stakeholder engagement strategy under the gender action plan that will provide specific guidelines and tools for i engaging with relevant stakeholders for promoting gender mainstreaming across the project activities.
- Develop and implement training Manual for Gender Mainstreaming in Disaster Risk Response and community awareness that will equip stakeholders with the necessary knowledge and skills to integrate gender considerations into gender responsive disaster preparedness and community awareness programmes.
- Proactively engage women, marginalized groups, and gender experts in in consultations, activities, and trainings sessions. For instance, women's groups will be integral in developing, approving, and using warning tools and methodologies to ensure they are tailored to their specific needs.
- These approaches will increase women's participation, improve their access to benefits, and empower them to contribute as agents of change in climate change actions. Sex-disaggregated data will be collected to assess the impact and relevance of interventions, and the project incorporates key performance indicators (KPIs) linked to gender and social inclusion. Quotas will be implemented to ensure equal participation in meetings, consultations, and training sessions related to early warning systems. The budget allocated to the Gender Action Plan is integrated into the overall project budget to ensure its effective implementation.

2.3. Monitoring and Evaluation

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A Gender Technical Officer hired by UN Women and integrated into the project governance structure will assume responsibility for overseeing the GAP in collaboration with the Project Management Team, specifically the Project Manager who holds eventual accountability on the Gender Action Plan and its overall implementation. The officer will be tasked with submitting semi-annual reports/ technical and financial with gender budget tracking to the RIE. Additionally, during periodic project progress monitoring meetings, the officer will address any emerging gender-related risks that may have been overlooked during the initial assessment. They will also be responsible for updating the GAP during the project's first year as the gender-responsive stakeholder engagement strategy is refined, and whenever unforeseen impacts or risks arise.

2.3.1. General Operating Principles:

- The Project Steering Committee will ensure compliance with the Adaptation Fund's Gender Policy.
- The updates to the Gender Action Plan will be presented by the PMT with the support of the gender project officer to the Project Steering Committee.
- The Project Steering Committee will review the gender-related aspects of the evaluation report.
- The gender project officer will report on progress with the Gender Action Plan for the quarterly reports as well as for the annual reports.

Table 20: Gender Action Plan: Gender Responsiveness of Project Outcomes/Activities

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Project Outcomes	Outputs	Gender-responsive Indicators	Gender Action	Target Gender Achievement	Means of Verifications
1. Reduced climate-induced cryosphere multi-hazard risk.	1.1. Integrated cryosphere risk mapping through community engagement.	Percentage of target communities with risk mapping and zoning documents.	Ensure participation (at least 33%) of women in the risk mapping; Community Watch groups and networks; design of the CB-MEWS; and regular forums with local governments, NGOs, businesses and communities as well as community-level activities. Establish a dedicated channel for gathering feedback and ensure that the needs and solutions of women and other marginalized groups feed into and are reflected in the vulnerability and exposure data collection; community monitoring plan. Adopt and apply gender-responsive approach for community-level projects and campaigns that enable meaningful participation of women and promoting their perspectives and voices related to cryosphere risks and reduction efforts. Conduct as part of the training initiatives.	Community-level risk assessment identifies gendered risks and is guided by the perceptions of local women in the target communities.	Final assessment Assessment methodology
	1.2. Community-based monitoring and early warning systems established.	Percentage of targeted communities with established CB-MEWS monitoring systems.		Community monitoring plan; evacuation plan; and CB-CWS are gender responsive addressing the differentiated needs of the target populations as well as allow meaningful participation of women.	Final Plans Participation lists of community capacity building workshops and communication channels
	1.3. Strengthened resilience to cryosphere-related risks.	Targeted communities with disaster response SOPs and CB-MEWS that consider gender-specific risks and procedures.		Recommendations on disaster response standards are gender responsive.	Operating procedures of local disaster responses
2. Increased access to spring water in climate adaptive and gender inclusive manner.	2.1. A comprehensive web-based information management system of springsheds and springs prepared for Malakand and Hazara divisions.	Comprehensive web-based database of springsheds and springs in the project areas.	Ensure (at least 33%) participation of women in the research studies, co-design of the recharge solutions; monitoring trainings and Spring users groups. Establish a dedicated channel for gathering feedback and ensure that the needs, challenges and solutions of women and other marginalized groups feed into and are reflected in the Springs inventory and assessment. Ensure (at least 50%) participation of women in the co-design of the recharge solutions; data monitoring systems; Spring users groups.	Springs inventory and assessment are gender responsive.	Final assessment
	2.2. Recharge measures (for improved springshed practices, land use planning, and bioengineering) co-developed and implemented.	Percentage increase in quantity and quality of water from identified springs.		No of women participated in the co-design exercise	List of participants of the co-design exercise

Project Outcomes	Outputs	Gender-responsive Indicators	Gender Action	Target Gender Achievement	Means of Verifications
	2.3. Local governance framework for springshed established with enhanced institutional capacity for efficient water resource management.	• Percentage of target communities with a local governance framework for springshed management. • Number of institutional capacity building interventions carried out in targeted communities.	Adopt and apply gender-responsive approach to the cost-benefit analysis and impact assessment; and development of guidelines and protocols for local level management of spring water resources including gender-transformative capacity building sessions	Local institutional capacity on gender-transformative approaches increased	Pre and post assessments of trainings, surveys, evaluations
3. Improved climate-resilient management of groundwater and community water supply services in vulnerable areas.	3.1. Groundwater mapping and groundwater recharge facilities completed in selected water-scarce locations in the middle basin, including establishing/ strengthening operation, maintenance, and management structures.	• Comprehensive web-based database of groundwater resource in the project areas. • Percentage of identified water recharge facilities completed. • Number of community structures established/strengthened for operation and management of groundwater recharge facilities.	Ensure participation (at least 33%) of women in groundwater study and mapping; water-supply assessment, feasibility study and community-based structures including women in the WASH Committees. Adopt gender-responsive approach to development of the technical training course and the infrastructure design (solarisation, lead hand-pumps etc.) Ensure that women community members and women-led households benefit from the solar-powered facilitates and hand-pumps.	Groundwater study, feasibility study, and water supply system assessment are gender-responsive. Community-based structures include women members. %. of women/women-led households using/benefitting from solar powered facilitates and handpumps	Final study and mapping and assessments. Community-based structures reports Pre- and post-assessments of the technical training courses. Monitoring reports Final programme reports
	3.2. Climate-smart and resilient water supply infrastructure established in selected sites, along with contextually relevant management structures with adequate capacity for operation and maintenance of the community infrastructure.	• Number of households with access to climate-resilient and sustainably managed water supply services (disaggregated by women-headed households). • Percentage of target water facilities with functional community water management structures. • Percentage of women participating in community-based groundwater management structures in the target communities (age disaggregated).			

Project Outcomes	Outputs	Gender-responsive Indicators	Gender Action	Target Gender Achievement	Means of Verifications
		• Number of solar-powered water facilities constructed/upgraded. • Number of climate-resilient handpumps installed.			
4. WASH infrastructure in the targeted communities in the Middle Indus Basin is more adaptive to climate change-induced shocks with up scaling of the contextually appropriate NbS	4.1. Targeted intervention sites identified for evidence-based, climate adaptive and focused WASH interventions.	Number of intervention sites identified and assessed.	Adopt gender-transformative approach in secondary WASH analysis, climate change data analysis and environmental and feasibility assessments including ensuring that women perspectives and needs guide the findings. Ensure participation of women (at least 33%) in environmental and feasibility assessments and community structures that operate and maintain wetlands. Ensure that women community members and women-headed households co-benefit from wetlands and Sewage treatment plans, increased water availability. Apply gender-transformative approach to the learning platforms and trainings.	WASH analysis, studies and assessments are gender-responsive. No. of women participating in feasibility assessment	Final WASH analysis Feasibility assessment list of participants
	4.2. NbS for sewage treatment demonstrated through constructed wetlands along with proper management structures and adequate capacity for operation and maintenance of wetlands.	• Number of constructed wetlands with proper management regime for the operation and maintenance developed and maintained. • Percentage of women participating in management of constructed wetlands (age disaggregated).		% of women/women-led households using or benefitting from sewage treatment plans and have increased water availability.	Monitoring reports Final programme reports
5. Community and institutional capacity to reduce surface water waste and increase its storage for productive use is increased, allowing communities to adapt to climate-induced shocks.	5.1. Government of Sindh supported in systematically prioritising 15 natural waterways and community water ponds to address water storage and wastage issues.	Study report on natural waterways and community ponds	Apply gender-responsive approach in ground-truthing of catchment feasibility study. Ensure that the developed local designs integrate the perceptions of local women. Ensure participation (33%) of women in communal pond management committees and management and operations. Ensure co-benefit of women in natural waterways and automatic water quality monitoring systems as well as in communal ponds construction and upgrade.	Ground-truthing study is gender-responsive including local designs for natural waterways and water ponds that respond to the needs of the local women.	Final study
	5.2. 15 selected waterways/ponds in Sindh Province restored/rehabilitated, including installation of water quality monitoring systems and establishing and	• Number of fully managed climate-resilient water storage structures in the project areas. • Number of community management committees established and strengthened.		% of women participating in water quality monitoring systems and communal pond management committees.	Monitoring reports Final programme report

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Project Outcomes	Outputs	Gender-responsive Indicators	Gender Action	Target Gender Achievement	Means of Verifications
	strengthening operation, maintenance, and management structures.			No of women benefitting from restored communal ponds.	Communal management committees meeting minutes
6. Improved knowledge and practices of communities and policymakers on climate change adaptation and climate risk reduction.	6.1. National and provincial capacities strengthened to apply innovative social and technological tools for establishing and enforcing human-centred and gender-transformative systems of climate change adaptation and accelerating the progress towards management of Indus water resources.	• Number of relevant, local institutions that receive technical training in innovative social and technological tools for climate change adaptation. • Percentage of people trained who report increased capacity and skills on gender-transformative approaches and adaptive capacities (Gender and age disaggregated).	Adopt gender-responsive approach in gap analysis of groundwater policies, review of adaptation measures as well as water management adaptation plans so that the analyses integrate the perspectives and needs of women but also allows participation of women in the process. Ensure women's meaningful participation (at least 33%) in co-development and testing of new social technologies to implementation of groundwater policies and regulations and water management adaptation plans as well as in workshops and forums that enhance coordination and collaboration at all levels. Apply gender-responsive approach and methodologies to consultations, co-development processes, and capacity building workshops for authorities that strengthen the gender-transformative capacities and knowledge of the partners. Develop gender-responsive indicators and collect gender data that feed into the data and knowledge platforms including CGPI and ccGAP.	Gap analysis and water management adaptation plan are gender-responsive. % of women participating and leading the co-development and testing of new approaches in the implementation activities. No. of local and national level authorities who report on increased understanding on the gendered impacts of climate change and strengthened capacities on gender-responsive approaches in climate mitigation and adaptation.	Final gap analysis Monitoring and final reports Water management adaptation plans Capacity building workshop reports. Interviews and pre-and post-test of capacity building activities.
	6.2. National and provincial stakeholders have access to strengthened evidence-based data and knowledge for informed decision-making and implementation of climate adaptation	• Number of knowledge products being accessed and used by policy makers, community leaders and others (guidelines, practical briefs, media articles) relating to climate change and WASH (gender disaggregated).	Ensure that the processes of identification of gender gaps and indicators as well as development and monitoring of gender disaggregated data are women-led (at least 60% are women). Mobilize women community members, particularly young women to participate and take lead in District Forums and awareness	No. of gender-responsive indicators. % of women participating in data collection/analysis/dissemination platforms.	Data collection mechanisms and indicators Qualitative data List of participants of data collection workshops and platforms.

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Project Outcomes	Outputs	Gender-responsive Indicators	Gender Action	Target Gender Achievement	Means of Verifications
	and mitigation that foster collaboration across sectors.	• Number people participating in spaces and platforms for sharing and exchanging of knowledge on climate adaptation practices (gender and age disaggregated).	raising campaigns at community level (50% women-led). Ensure that at least 50% of the knowledge products and case studies / success stories l as well as awareness raising campaigns are gender-responsive including increasing the awareness of the local impacts of climate change its gendered impact on human security. Provide targeted capacity building and mentorship to women in co-development of success stories and awareness raising campaigns that enhance the women's leadership capacities.		Monitoring reports.
	6.3. Youth and women's leadership as well as community-led adaptation solutions strengthened in climate action through awareness raising and behavioural change campaigns.	• Number of community members participating in awareness building and behaviour change campaigns to promote the uptake of new adaptation solutions (gender and age disaggregated). • Number of partners reached through the campaigns and activities that foster social cohesion and understanding of the climate change and its gendered and human security implications.		% of women, particularly young women participating and leading community level activities including awareness raising and policy advocacy actions. % of knowledge products and case studies that are gender-responsive No of public awareness raising campaigns that are gender-responsive. No of women who have participated in targeted capacity building activities.	Monitoring and programme report on community level activities and public campaigns Knowledge products, success stories and other published communication products and studies. Public awareness campaign materials Interviews and pre-and post-test of capacity building activities

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Annex 6: Geospatial Details of Physical Interventions

Component	Proposed Intervention	Province	District	Taluka/Tehsil	UC	Village	Latitude	Longitude
2	Recharge pits, trenches, absorption terraces, small ponds & check dams	KP	Abbottabad	Abbottabad			34.360000	73.210000
2		KP	Abbottabad	Abbottabad			34.170000	73.200000
2		KP	Abbottabad	Abbottabad	Nathia Gali		34.060000	73.370000
2		KP	Abbottabad	Abbottabad	Nathia Gali		34.060000	73.380000
2		KP	Lower Dir	Adenzai			34.750000	71.983000
2		KP	Lower Dir	Adenzai			34.767000	72.034000
2		KP	Mansehra	Mansehra	Shinkiari		34.480000	73.290000
2		KP	Swat	Babuzai			34.370000	72.140000
2		KP	Swat	Babuzai			34.390000	72.150000
2		KP	Swat	Babuzai			34.400000	72.160000
3	Solar pump	KP	Charsadda	Charsadda	Utmanzai	WSS Utmanzai Sheikhan	34.184179	71.756309
3	Solar pump	KP	Charsadda	Charsadda	Tarnab	WSS Tarnab 1	34.222683	71.679817
3	Solar pump	KP	Charsadda	Charsadda	Tarnab	WSS Tarnab 2	34.224340	71.679150
3	Solar pump	KP	Charsadda	Charsadda	Agra	WSS Dagai	34.999020	72.347310
3	Solar pump	KP	Charsadda	Shabqadar	Shabqadar	Shabqadar Bazar Water Filtration plant.	34.222700	71.566600
3	Solar pump	KP	Charsadda	Charsadda	Garhi Hameed Gul	WSS Garhi Hamid Gul	34.156447	71.744557
3	Solar pump	KP	Charsadda	Charsadda	Qazi Khel	WSS Qazi Khel	34.154215	71.741134
3	Solar pump	KP	Charsadda	Shabqadar	Shabara	WSS Shabara	34.127183	71.732583
3	Solar pump	KP	Charsadda	Charsadda	Katozai	WSS Katozai No. 2	34.282300	71.594200
3	Solar pump	KP	Charsadda	Tangi	Battagram	WSS Dildar Garhi	34.206500	71.536300
3	Solar pump	KP	Charsadda	Tangi	Chowki Town	WSS Tube well # 1	34.206500	71.536400
3	Solar pump	KP	Charsadda	Charsadda	Charsadda	DWSS TMA Office Charsadda	34.153824	71.746770
3	Solar pump	KP	Charsadda	Shabqadar	Shabqadar	WSS Shabqadar Park-1	34.131500	71.340600
3	Water Recharge facilities	KP	Charsadda	Shabqadar	Sardar Garhi	Matta Daman, Near Saddar Garhi Police Chowki Khwar - Up/Stream.	34.301000	71.565000
3	Solar pump	KP	Nowshera	Nowshera	Kaka Sahib	WSS Kaka Saib	33.929018	72.045245
3	Solar pump	KP	Nowshera	Nowshera	Kaka Sahib	WSS PTC US Kaka Saib	33.929018	72.045245
3	Solar pump	KP	Nowshera	Nowshera	Zaidi Colony	WSS Zaidi colony	34.024367	71.997498
3	Solar pump	KP	Nowshera	Nowshera	Gaggaikhel	DWSS Gaggai khel 1 and Sadullah	34.013475	71.975552
3	Solar pump	KP	Nowshera	Nowshera	Pabbi 2	DWSS Kotli Khurd	33.856400	71.879500

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Component	Proposed Intervention	Province	District	Taluka/Tehsil	UC	Village	Latitude	Longitude
3	Solar pump	KP	Nowshera	Nowshera	Nowshera	DWSS Kabul River TW	34.016149	71.992723
3	Solar pump	KP	Nowshera	Nowshera	Kaka sahib	Kaka Sahib	33.929018	72.045245
3	Water Recharge facilities	KP	Nowshera	Pabbi	UC Shahkot	WSS Salih Khana	33.851500	71.871000
3	Water Recharge facilities	KP	Nowshera	Pabbi	Pabbi	DWSS Kotli Khurd	33.856400	71.879500
3	Water Recharge facilities	KP	Nowshera	Nowshera	kaka Sahib	WSS Kaka Sahib	33.928852	72.036689
3	Solar pump	KP	Swat	Barikot	Gumbatoona	DWSS Gumbatoona	34.688800	72.187000
3	Solar pump	KP	Swat	Kabal	Daryal	DWSS Daryal - Gravity	34.941903	72.196205
3	Solar pump	KP	Swat	Kabal	Deolai	DWSS Deolai Colony	34.850100	72.267300
3	Solar pump	KP	Swat	Matta	Fazal Banda	DWSS Fazal Banda (Gravity).	35.074700	72.251300
3	Solar pump	KP	Swat	Matta	Darmai	DWSS Darmai	35.073668	72.439804
3	Water Recharge facilities	KP	Swat	Khwazakhela	Langar Kalay	WSS Langar Kallay	34.947325	72.494924
3	Water Recharge facilities	KP	Swat - I	Barikot	Kotlai	WSS Kotlai Swat-Khwar + Shamozai Area + Saidu Sharif - PHE Colony - Drought Site	34.786500	72.225500
3	Lead line handpump	Sindh	Khairpur	Kot Diji	Deh Sohu	Soomar Banbhro	27.379788	68.755975
3	Lead line handpump	Sindh	Khairpur	Kot Diji	Deh Sohu	M. Siddique Bugti	27.383181	68.752358
3	Lead line handpump	Sindh	Khairpur	Kot Diji	Deh Sohu	Qadir Bux Bugti	27.367111	68.748081
3	Lead line handpump	Sindh	Khairpur	Kot Diji	Fatehpur	Sawal Waro Tanwari	27.343431	68.586930
3	Lead line handpump	Sindh	Khairpur	Gambat	Bhelaro	Lundi Sheikh	27.415166	68.430150
3	Lead line handpump	Sindh	Khairpur	Gambat	Bhelaro	Bhelaro	27.398079	68.421783
3	Lead line handpump	Sindh	Khairpur	Gambat	Bhelaro	Muhammad Jo Wahan	27.385891	68.426498
3	Lead line handpump	Sindh	Khairpur	Sobho Dero	Rasoolabad	Ranjho Jalbani	27.156807	68.420959
3	Lead line handpump	Sindh	Khairpur	Sobho Dero	Rasoolabad	Muhammad Juman Norah Pota	27.151774	68.426258
3	Lead line handpump	Sindh	Khairpur	Sobho Dero	Rasoolabad	Darwesh Bagh	27.161004	68.418584
3	Lead line handpump	Sindh	Khairpur	Sobho Dero	Rasoolabad	Latif Shambani	27.164604	68.423808
3	Solar pump	Sindh	Khairpur	Kot Diji	Deh Sohu	Gul Bahar Kandhiro	27.364050	68.762890
3	Solar pump	Sindh	Khairpur	Kot Diji	Kot Diji Town	Kareem Bux Solangi	27.362858	68.741153
3	Solar pump	Sindh	Khairpur	Gambat	Gambat Town	Mazal Muhammad Mahar/Darro	27.362450	68.558231
3	Solar pump	Sindh	Khairpur	Gambat	Gambat Town	Dhopara	27.361541	68.597425
3	Solar pump	Sindh	Khairpur	Sobho Dero	Rasoolabad	Ammer Bux Jarrah	27.156699	68.429438
3	Solar pump	Sindh	Khairpur	Sobho Dero	Rasoolabad	Dawood Nooh Pota	27.152367	68.422255

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Component	Proposed Intervention	Province	District	Taluka/Tehsil	UC	Village	Latitude	Longitude
3	Lead line handpump	Sindh	Mirpurkhas	KGM	Haji Hadi Bux	Aodumal Otaq	25.258190	69.334250
3	Lead line handpump	Sindh	Mirpurkhas	KGM	Haji Hadi Bux	Nazim Seth Hameer	25.248300	69.363860
3	Lead line handpump	Sindh	Mirpurkhas	Sindhri	Ismail Khumbhar	Jalo Bheel	25.707190	69.216110
3	Lead line handpump	Sindh	Mirpurkhas	Digri	Meer Fateh Khan	Qadirabad	25.122570	69.111470
3	Lead line handpump	Sindh	Mirpurkhas	Digri	Meer Fateh Khan	Khako Khan Mehar	25.094160	69.150730
3	Lead line handpump	Sindh	Mirpurkhas	KGM	Mir Ali Bux Talpur	Ghous Bux Bhurguri	25.330310	69.267420
3	Lead line handpump	Sindh	Mirpurkhas	Digri	Mir Khuda Bux	Darya Khan Kaloi	25.074700	69.122800
3	Lead line handpump	Sindh	Mirpurkhas	Hussain Bux Mari	OLD Mirpur	Haji Manthar Mari	25.555860	69.028540
3	Lead line handpump	Sindh	Mirpurkhas	Hussain Bux Mari	OLD Mirpur	Yar Mohammad Jhinji	25.570280	69.062960
3	Lead line handpump	Sindh	Mirpurkhas	Sindhri	Sarhal	Qazi Huzoor Bux	25.733670	69.242120
3	Lead line handpump	Sindh	Mirpurkhas	Shujabad	Tajo Khaskheli	Gela Ram	25.418510	68.982190
3	Lead line handpump	Sindh	Mirpurkhas	Shujabad	Tajo Khaskheli	Padam Ji Meghwar	25.412180	69.014760
3	Solar pump	Sindh	Mirpurkhas	Sindhri	Chetori	Khair Mohammad Junejo	25.593510	69.084254
3	Solar pump	Sindh	Mirpurkhas	KGM	Haji Hadi Bux	Abdullah Aziz Khan	25.258890	69.352620
3	Solar pump	Sindh	Mirpurkhas	KGM	Haji Hadi Bux	Qazi Rahim Dino Bhatti	25.238140	69.324340
3	Solar pump	Sindh	Mirpurkhas	Sindhri	Hangoro	Nazar Muhammad Nizamani	25.734130	69.187980
3	Solar pump	Sindh	Mirpurkhas	Sindhri	Jhurbi	Haji Wahid Bux	25.641370	69.135320
3	Solar pump	Sindh	Mirpurkhas	Digri	Kangoro	Syed Noor Mohammad Shah	25.437640	69.026620
3	Solar pump	Sindh	Mirpurkhas	Digri	Kangoro	Kangoro	25.236900	69.033900
3	Solar pump	Sindh	Mirpurkhas	Shujabad	Khumbri	Krishan Kolhi / Nanji Patel	25.394040	69.045300
3	Solar pump	Sindh	Mirpurkhas	Shujabad	Khumbri	Mevo Laghari / Kiran Kumar	25.153590	69.109140
3	Solar pump	Sindh	Mirpurkhas	Shujabad	Makhan Samon	Mohammad Saleh Khaskheli	25.421860	69.017110
3	Solar pump	Sindh	Mirpurkhas	Digri	Meer Fateh Khan	Abdul Rasheed Abring	25.128110	69.139850
3	Solar pump	Sindh	Mirpurkhas	KGM	Mir Ali Bux Talpur	Mohammad Soomar Sehto	25.303300	69.257020
3	Solar pump	Sindh	Mirpurkhas	KGM	Mir Ali Bux Talpur	Sain Ghulam Rasool	25.285710	69.250320
3	Solar pump	Sindh	Mirpurkhas	Digri	Mir Khuda Bux	Meghwar Colony	25.064210	69.164800
3	Solar pump	Sindh	Mirpurkhas	Hussain Bux Mari	OLD Mirpur	Haji Farooq Jhinji	25.590770	69.075440
3	Solar pump	Sindh	Mirpurkhas	Hussain Bux Mari	OLD Mirpur	Haji Yaqoob Jhinjhi	25.575390	69.059990
3	Solar pump	Sindh	Mirpurkhas	Hussain Bux Mari	OLD Mirpur	Seth Ratan Chand	25.596290	69.045210
3	Solar pump	Sindh	Mirpurkhas	Hussain Bux Mari	OLD Mirpur	Muhammad Usman Rajjar Colony	25.555470	69.044180
3	Solar pump	Sindh	Mirpurkhas	Sindhri	Sarhal	Kandho Nohri	25.731430	69.248450
3	Solar pump	Sindh	Mirpurkhas	Shujabad	Tajo Khaskheli	Mehboob Khaskheli	25.418860	68.983120
3	Lead line handpump	Sindh	Sujawal	Jati	Koti	Goth Methan Malah	24.357371	68.265456
3	Lead line handpump	Sindh	Sujawal	Jati	Koti	Goth Jumoon Taheem	24.357456	68.265372

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Component	Proposed Intervention	Province	District	Taluka/Tehsil	UC	Village	Latitude	Longitude
3	Lead line handpump	Sindh	Sujawal	Jati	Koti	Goth Pandi Taimur	24.357861	68.265892
3	Lead line handpump	Sindh	Sujawal	Jati	Koti	Goth Abdullah Taimur	24.357068	68.265256
3	Lead line handpump	Sindh	Sujawal	Jati	Koti	Goth Haji Mohammad Abbasi	24.357271	68.265356
3	Lead line handpump	Sindh	Sujawal	Jati	Koti	Goth Dargah Sheikh Mohammad	24.357252	68.265321
3	Lead line handpump	Sindh	Sujawal	Jati	Koti	Goth Salih Muhammad	24.357692	68.265156
3	Solar pump	Sindh	Sujawal	Mirpur Bathoro	Akbar Shah	Goth Basar Khaskheli	24.613066	68.071572
3	Solar pump	Sindh	Sujawal	Mirpur Bathoro	Akbar Shah	Goth Dilshad Kharak	24.613052	68.071563
3	Solar pump	Sindh	Sujawal	Mirpur Bathoro	Akbar Shah	Goth Syyed Ata Shah	24.612065	68.071652
3	Solar pump	Sindh	Sujawal	Mirpur Bathoro	Jhok Shareef	Goth Ghulam Hussain Khaskheli	24.613130	68.071652
3	Solar pump	Sindh	Sujawal	Mirpur Bathoro	Jhok Shareef	Goth Tajan Sameejo	24.614160	68.071253
3	Solar pump	Sindh	Sujawal	Mirpur Bathoro	Kandhor	Goth Banu Khaskheli	24.616198	68.072372
3	Solar pump	Sindh	Sujawal	Mirpur Bathoro	Mirpur Bathoro	GBHSS Mirpur Bathoro	24.613066	68.071572
3	Solar pump	Sindh	Sujawal	Mirpur Bathoro	Shah Mohammad Shah	Goth Hamzo Malah, Parah Khuda Dino	24.613863	68.071895
3	Solar pump	Sindh	Sujawal	Mirpur Bathoro	Shah Mohammad Shah	Goth Hamzo Malah, Parah Gull Sher	24.613122	68.071438
3	Solar pump	Sindh	Sujawal	Mirpur Bathoro	Shah Mohammad Shah	Goth Ghazi Khan Chang	24.613066	68.071572
3	Solar pump	Sindh	Sujawal	Mirpur Bathoro	Shah Mohammad Shah	Goth Dhani Bux Jamali	24.623178	68.072365
3	Solar pump	Sindh	Sujawal	Mirpur Bathoro	Shah Mohammad Shah	Goth Bhalu Kohli	24.613166	68.071133
3	Solar pump	Sindh	Sujawal	Mirpur Bathoro	Shah Mohammad Shah	Goth- Ahmed Rahbar	24.613060	68.071571
3	Solar pump	Sindh	Sujawal	Mirpur Bathoro	Shah Mohammad Shah	Goth Lal Bux Zahoor	24.613065	68.071570
3	Solar pump	Sindh	Sujawal	Mirpur Bathoro	Shah Mohammad Shah	Goth Moosa Kotai	24.613058	68.071580
3	Lead line handpump	Sindh	Sukkur	Kandhara	Wah Burira	Abdullah Jagirani	27.582656	68.861710
3	Lead line handpump	Sindh	Sukkur	Kandhara	Wah Burira	Meeral Faqeer	27.564916	68.836350
3	Lead line handpump	Sindh	Sukkur	Kandhara	Wah Burira	Khadim Hussain Jagirani	27.584250	68.863298
3	Lead line handpump	Sindh	Sukkur	Bachal Shah	Saeedabad	Hussain Bux Lashari	27.710501	68.790606
3	Lead line handpump	Sindh	Sukkur	Bachal Shah	Saeedabad	Elahi Bux Lashari	27.712146	68.786791
3	Lead line handpump	Sindh	Sukkur	Bachal Shah	Saeedabad	Shair Muhammad Kharos	27.693693	68.800358
3	Solar pump	Sindh	Sukkur	Kandhara	Wah Burira	Dahro Jagirani	27.557814	68.829452
3	Solar pump	Sindh	Sukkur	Kandhara	Wah Burira	Gul Muhammad Lashari	27.546590	68.830238

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Component	Proposed Intervention	Province	District	Taluka/Tehsil	UC	Village	Latitude	Longitude
3	Solar pump	Sindh	Sukkur	Bachal Shah	Saeedabad	Ghous Pur Magnejo	27.693693	68.800358
3	Solar pump	Sindh	Sukkur	Bachal Shah	Saeedabad	Maitla	27.701996	68.807085
3	Lead line handpump	Sindh	Tharparkar	Diplo	Talo Jam	Landhi Saran	24.517825	69.573568
3	Lead line handpump	Sindh	Tharparkar	Diplo	Dhabro	Hashim Khoi	24.510573	69.573858
3	Lead line handpump	Sindh	Tharparkar	Diplo	Bhadoor	Dhabi	24.510000	69.571728
3	Solar pump	Sindh	Tharparkar	Diplo	Dhabro	Sakri	24.510229	69.571257
3	Solar pump	Sindh	Tharparkar	Diplo	Jhirmilio	Rohal	24.510350	69.571128
3	Solar pump	Sindh	Tharparkar	Diplo	Dhabro	Hathrai	24.519328	69.577858
3	Solar pump	Sindh	Tharparkar	Diplo	Bolhari	Somrahar	24.518672	69.575416
3	Solar pump	Sindh	Tharparkar	Diplo	Sobliyar	Mokiryar	24.510313	69.571581
3	Lead line handpump	Sindh	Umerkot	Umerkot	Debho	Tulcho Kolhi	25.413322	69.580822
3	Lead line handpump	Sindh	Umerkot	Samaro	Gulzar e Khalil	Ghulam Hussain Bhambhro/ Yousif Sial	25.367918	69.415035
3	Lead line handpump	Sindh	Umerkot	Umerkot	Khan Sb Atta Mohd Palli	Saiban Jo Goth	25.398432	69.620137
3	Lead line handpump	Sindh	Umerkot	Umerkot	Kharoro Sayed	Deeno Chang	25.372115	69.707057
3	Lead line handpump	Sindh	Umerkot	Samaro	Samro Road	Moti Malhi	25.290459	69.417505
3	Lead line handpump	Sindh	Umerkot	Samaro	Satryion	Mehboob Shah	25.458596	69.385815
3	Lead line handpump	Sindh	Umerkot	Samaro	Satryion	Majer Palli	25.296519	69.521099
3	Lead line handpump	Sindh	Umerkot	Umerkot	Walli Dad	Dumano	25.330915	69.595163
3	Solar pump	Sindh	Umerkot	Umerkot	Debho	Qazi Mohsan Palli	25.464080	69.551270
3	Solar pump	Sindh	Umerkot	Umerkot	Debho	Fateh Mohd Rajar	25.418910	69.567600
3	Solar pump	Sindh	Umerkot	Umerkot	Faqeer Abdullah	Faqeer Abdullah	25.176310	69.676100
3	Solar pump	Sindh	Umerkot	Umerkot	Khan Sb Atta Mohd Palli	Soofi Taleh Mohd Markan	25.409390	69.557280
3	Solar pump	Sindh	Umerkot	Umerkot	Khan Sb Atta Mohd Palli	Bhadeli	25.351850	69.678130
3	Solar pump	Sindh	Umerkot	Umerkot	Kharoro Sayed	Rabaryo	25.471140	69.677970
3	Solar pump	Sindh	Umerkot	Umerkot	Kharoro Sayed	Sona Rasti	25.441690	69.716530
3	Solar pump	Sindh	Umerkot	Umerkot	Mir Walli Mohd Talpur	Lakho Water	25.279150	69.564550
3	Solar pump	Sindh	Umerkot	Umerkot	Sabho	Mola Bux Rajar	25.480980	69.656280
3	Solar pump	Sindh	Umerkot	Umerkot	Walli Dad	Bag Water	25.321630	69.591660
3	Solar pump	Sindh	Umerkot	Samaro	Satryion	Ibhraim Shah	25.385760	69.470860
3	Solar pump	Sindh	Umerkot	Samaro	Mir Mohd Bhurgari	Gulam Rasool Dhonkai	25.320540	69.453020

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Component	Proposed Intervention	Province	District	Taluka/Tehsil	UC	Village	Latitude	Longitude
3	Solar pump	Sindh	Umerkot	Samaro	Samro Road	Ramzan Dhonkai	25.308640	69.444350
3	Solar pump	Sindh	Umerkot	Samaro	Mir Mohd Bhurgari	Sono Kolhi/Mubeen Kachelo	25.295360	69.490220
3	Solar pump	Sindh	Umerkot	Samaro	Satryion	Mufti Asad Ali	25.303590	69.457830
3	Solar pump	Sindh	Umerkot	Samaro	Mir Mohd Burgri	Anis Ahmed Burgri	25.301080	69.439660
3	Solar pump	Sindh	Umerkot	Samaro	Mir Mohd Burgri	Dharshi Bhagat Kolhi	25.295150	69.424540
3	Solar pump	Sindh	Umerkot	Samaro	Mir Mohd Burgri	Jan Mohd Burgri	25.29650	69.423870
3	Solar pump	Sindh	Umerkot	Samaro	Gulzar e Khalil	Nawaz Ali Shah	25.419670	69.394530
3	Solar pump	Sindh	Umerkot	Samaro	Gulzar e Khalil	Niaz Ahmed Qaimkhani	25.372746	69.4045564
4	Wetland	KP	Charsadda	Tangi	TMA Tangi	Nasrat Zai Bazar (balbalay street to Main Charsadda Road)	34.291907	71.659093
4	Wetland	KP	Nowshera	Nowshera	TMA Pabbi	Pabbi town to Qabristan Road	34.217300	71.577000
4	Wetland	KP	Swat	Babuzai	Mingora	Fateh Pur Village	34.069236	72.482042
4	Wetland	Sindh	Khairpur	Sobho Dero	Dhonbut Pur	Anb	27.302784	68.395653
4	Wetland	Sindh	Khairpur	Sobho Dero	Mirak	Mirak	27.302328	68.395157
4	Wetland	Sindh	Khairpur	Sobho Dero	Pir Hayat Shah	Pir Hayat Shah	27.362789	68.394186
4	Wetland	Sindh	Khairpur	Sobho Dero	Sagyoon	Qazi Bhutto	27.302258	68.395243
4	Wetland	Sindh	Sukkur	Kandhara	Wah Burira	Gul Muhammad Lashari	27.589273	68.884109
5	Doras	Sindh	Sanghar	Sinjhoro	Sethar Pir	Near GBPS Dur Muhammad Mari, Village Karam Khan Marri	25.829355	69.116971
5	Doras	Sindh	Sanghar	Sanghar	Chotiario	Village Shafiabad, 62 Chak	26.048372	69.192556
5	Water ponds	Sindh	Sanghar	Sanghar	Chotiario	Chotiario Road Near, Near Masjid Chotiario	26.048101	69.192446
5	Water ponds	Sindh	Tharparkar	Chachro	Chachro	Tamachi Je Very	25.108086	70.263319
5	Water ponds	Sindh	Tharparkar	Islamkot	Islamkot	Kathiar Bajeer	24.702090	70.178525
5	Water ponds	Sindh	Tharparkar	Islamkot	Kahri	Rana Tarai	24.678760	70.118450
5	Water ponds	Sindh	Tharparkar	Mithi	Mithi	R&D Farm Mithi	24.759111	69.810526
5	Water ponds	Sindh	Tharparkar	Chachro	Mithrio	Piro Jo Goath Khiari	25.108253	70.263619
5	Water ponds	Sindh	Tharparkar	Mithi	Posarko	Khariwah	24.759321	69.810628
5	Water ponds	Sindh	Tharparkar	Mithi	Posarko	Khariwah	24.759111	69.810526
5	Water ponds	Sindh	Tharparkar	Deeplo	Sobyar	Karihar	25.347583	69.742240
5	Water ponds	Sindh	Tharparkar	Deeplo	Sobyar	Malyar	25.347583	69.742256
5	Doras	Sindh	Umerkot	Umarkot	Doronaro	Village Fazal Chopan (1.31km), Near Govt Middle School Fazal Chopan (1.32km) & Manghan Chopan (1.45 km),3.28Km from Doronaro city	25.497771	69.573019

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Component	Proposed Intervention	Province	District	Taluka/Tehsil	UC	Village	Latitude	Longitude
5	Doras	Sindh	Umerkot	Umarkot	Umerkot	Kharuro Syed on Umerkot Ratnore Road Near GBPS Muhammad Urs Bajeer	25.492158	69.576176
5	Water ponds	Sindh	Umerkot	Umarkot	Doronaro	Haji Sher khan Mangrio/ Haji Khan Muhammad Mangrio	25.497328	69.573728

Notes: CBDRM = community based disaster risk management; CBMEWs = community-based monitoring and early warning systems; CWG = community watch groups; ICS: integrated communication system; WSS = water supply scheme.

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Annex 7: Economic, Social and Environmental Benefits by Components

Type of Benefit	Baseline	With/After Project
Economic	Cryosphere – In the upper basin, cryosphere hazards like avalanches, glacial surges, GLOFs etc., increasingly destroy the livelihood basis of communities.	• Communities are more able to adapt to cryosphere hazards both in the long term through integration into site planning and in the short term in terms of inclusive community-based early warning systems. • Policymakers at the local level are empowered to better anticipate cryosphere risks to inform climate-resilient infrastructure planning, reducing the loss of property in case of cryosphere disasters, and more able to anticipate these disasters reducing response times.
	Springs – In the middle basin, rural and municipal water supplies relying on springs are increasingly strained, resulting in a loss of income opportunities.	• Communities are empowered to adapt their practices in terms of communal springshed management to increase water availability for essential for life and livelihoods in the face of climate change-induced shocks. • Policymakers at the local level are more able to plan resilient and inclusive income creation investments and mitigate the impact of water scarcity on the human security, including health.
	Groundwater and Resilient Community Water services – In the upper and middle Basin, groundwater levels are being depleted at unsustainable rates resulting in a loss of income opportunities. Water supply services for communities in middle and lower basin damaged by recurrent flooding which led to economic losses for reconstruction and rebuilding.	• Communities are empowered to adapt their practices to increase water availability for economic purposes, especially for women and youth, reducing the volatility of income opportunities due to water scarcity. Green and climate-resilient community water supply facilities will provide economic benefits by reducing operation and maintenance costs and reducing cost of damages due to climate change risks like flooding. • Sustainable and inclusive water practices and services improve water security, including health conditions, and reduce HH medical costs. • Inclusive and gender-transformative local knowledge and adaptation skills create livelihood for marginalised community members including women and youth.
	EbAs – In the middle and lower basin, increasingly toxic urban effluent is endangering communities and ecosystems, increasing health expenditures.	• Communities are empowered to adapt their practices through EbAs to increase water availability for economic purposes. Especially for women and youth and reduce health expenditure by households incurred for medical treatment through reducing pollution. • Constructed Wetlands have lower operation and maintenance costs compared with conventional waste treatment facilities which reduces expenditure on O&M which in turn reduce the HH expenditure for sewage collection and disposal costs. • By engaging communities for construction activities, the project will contribute for building local knowledge and skills and create livelihood for community members, especially women and youth. • Policymakers at the local level are more able to plan resilient and inclusive water-dependent income creation investments.
	Surface Water Conservation – In the lower basin, surface water scarcity is leading to use of saline and brackish groundwater by	• Communities are empowered to adapt surface water conservation practices to increase freshwater availability and improve groundwater

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Type of Benefit	Baseline	With/After Project
	most communities and increased cost of water treatment, loss of income and increased health costs	quality through increased recharge. This will reduce cost of water treatment as surface water need simple filtration while saline groundwater needs expensive treatment options like reverse osmosis systems. • Increased water availability improve access to water supply for hygiene, sanitation and other domestic use which will improve water security and health conditions of communities and reduce cost of treatment, especially for women and children.
	Adaptive capacities and empowered communities – Limited efficient springshed management, groundwater management and reduction of cryosphere risks regulations and strategies led to unregulated extraction of groundwater, unfair use of existing resources and increased risk of communities which resulted loss of income for government, high capital investment to reach communities in water scarce locations due to unbalanced use and poor health due to limited-service coverage. Limited coordination capacity, capacities of inclusion of women and youth, monitoring and information management capacity of new and existing climate change initiatives at all levels which led to duplication of efforts, limited use of available community potential and climate financing streams and advocacy for resources. No proper KM platform to document local and Indigenous community adaptation practices, especially those of women and youth, introducing new practices from experiences of other countries and to increase investment on scaling up of community-based adaptation. Limited technical knowledge of awareness on impact of climate change, individual/community maladaptation practices increased exposure and vulnerabilities of communities for different climate change-related hazards and risks which in turn led to loss of household and community assets and infrastructure	• Federal, provincial, and district-level government institutions supported to develop and enforce adaptive policies guidelines and regulations which will reduce cost of expenditure for emergency responses, increase equitable water supply services across the target locations and create revenue for the government through optimal charges of water consumers including from agriculture and industrial users. • Improved coordination, IM and evidence generation capacity at federal and provincial level will have an economic benefit by improving efficiency, increasing inclusion reducing duplications, and expanding access to new financing for climate change adaptation. • Targeted KM products and platforms for experience sharing, advocacy and project design will have an economic benefit by increasing investment for adaptation improve efficiency as it leads to focused intervention based on experience of the past and the needs of local populations in different locations. • Enhanced knowledge and awareness on impact of climate change, climate and human security risks, inclusive and resilient individual and community adaptation practices will reduce the exposure and impact of climate change hazards and in turn reduce economic losses at all levels for replacement of lost assets and infrastructure.
Social	Cryosphere – In the upper basin, the retreating glaciers and the associated increase in risks increase poverty and vulnerability of high-altitude communities driving urbanisation, which contributes to the already unsustainable strain on urban infrastructure; furthermore, climate-induced cryosphere hazards destroy downstream infrastructure, including bridges and hydroelectric production sites resulting in decreased	• Communities exposed to cryosphere risk will be more able to adapt and respond to them, increasing resilience and increasing the likelihood of the communities remaining in their areas of origin. • Local leaders will be able to make better informed, sustainable, and inclusive decisions on investment in transportation and energy infrastructure and their climate proofing, as well as anticipating and responding to such disasters more effectively.

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Type of Benefit	Baseline	With/After Project
	accessibility and reduced access to productive energy in the upstream communities, further increasing rural flight pressures.	
	Springs – In the middle basin, rural and municipal water supplies rely on up to 25% of spring water; these are increasingly drying up and polluted, increasing the cost of water, and reducing its availability and quality, leading to increased community vulnerability and competition for scarce resources.	• Communities in the middle basin are more able to ensure that springs feeding municipal water supplies are revived and cleaner, reducing their vulnerability and decreasing community conflict resulting from competition for scarce clean water resources. • Local leaders can use policy incentives and community engagement to replicate the results in other communities.
	Groundwater and Resilient Community Water Services – Groundwater is being depleted at an unsustainable rate; Pakistan is the fourth largest groundwater extractor and largest groundwater exporter in the world, and the Indus Basin Aquifer is the second most overstressed aquifer globally; this is leading to increased competition for limited water resources and creating inter-communal conflict and ressentiment by some segments of the society not served because of unregulated use by others. Water supply service infrastructure recurrent damage and lack of access to water due to extreme weather events led to seasonal displacement, increased risk of gender-based violence and lost school days for children for fetching water or because of lack of water in the learning facilities	• Communities are more able to use groundwater in a more sustainable manner while ensuring that the recharge of the groundwater levels is maximised through NbS in combination with solar and hand water pumps, decreasing the scarcity of groundwater, increasing its quality, and reducing community vulnerability and inter-communal competition. • Climate-resilient water supply facilities will have a very high social benefits by providing sustainable and accessible services which will reduce displacement, reduce gender-based violence and support to maintain and increase school enrolment
	EbA*s* – Ecosystems and the communities that benefit from them are increasingly in danger as urbanisation increases from increased household untreated effluent, posing serious health risks due to water contamination and release to the communal areas	• Constructed wetlands can create a green facility where communities can benefit from clean and green environment. Reduce risk of conflict between neighbourhoods arising from releasing of wastewater to open drains and communal land. • Opportunities created for other communities to adopt the constructed wetlands approach to scale up the social impact of the project in cooperation with the private sector.
	Surface Water Conservation – Scarcity of surface water in the lower basin contributes to communal competition and negative health outcomes due to unsustainable levels of water consumption in the context of climate-related changes in precipitation changes.	• Community members are more resilient to climate-induced changes in precipitation patterns, reducing the negative impact of saline water on community health outcomes by providing freshwater alternative, increase social cohesion due to need of whole community participation on the implementation and management of community ponds and reduce conflicts due to scarce resources by increasing the water availability in target locations. • The project will create opportunities for other communities to adopt the community pond approach to achieve analogous results, scaling up the social impact of the project in cooperation with the private sector.
	Adaptive capacities and empowered communities – Limited technical knowledge and awareness on impact of climate change at communities and households combined with limited	• With enhanced awareness, KM platforms and project supported regulatory frameworks and improved capacities equitable water use will be improved, communities better preprepared for future climate-induced

Type of Benefit	Baseline	With/After Project
	regulatory frameworks and poor enforcement capacity at all levels created irresponsible and unequitable use of existing water resources mainly groundwater which led to a major social problem where only the reach and privileged take advantage of lack of regulation at the cost of the poor and marginalised which created conflict and resentment	disasters and knowledge, innovations and new technologies will be disseminated across different locations which will improve social cohesion, reduce resentment between groups and reduce conflict as the government will have enhanced governance and inclusive water management across the Indus Basin. • Local leaders and community platforms have access to evidence on risk of the cryosphere, existing hydrogeological situation of springs and groundwater, as well as new practices and tools that foster inclusive community-level practices, and gender-responsive policy recommendations for sustainable local climate adaptation, which will support creating enabling environment, enhance capacities for implementation and enforcement roles of the government which in turn improve sustainable social services
Environmental	Cryosphere – Currently, management of cryosphere hazards relies on the construction of hard infrastructure; this perpetuates unsustainable site planning in a non-resilient manner and triggers negative environmental consequences such as habitat loss and increasing erosion potential.	• Communities use improved site and land planning practices to avoid the negative environmental impacts of unsustainable and non-resilient construction practices. • Policymakers benefit from an improved evidence base that informs environmental risk assessments and asset depreciation calculations regarding downstream infrastructure investment.
	Springs – Springsheds are not mapped or well understood in terms of their catchment area; therefore, they are increasingly drying up and becoming polluted; this leads to negative environmental consequences both for the communities that depend on the springs and the ecosystems that serve essential environmental functions, resulting in negative health outcomes for humans and a loss of local biodiversity.	• Communities are aware of the extent of their springsheds, the consequences of their pollution, how to recharge them and how to govern the equitable distribution of its flow, reducing the negative health impacts and reducing the impact of human settlement on local biodiversity. • Local leaders have access to a low-cost, community-driven methodology for reviving springs and, by extension protecting public health and contributing to local biodiversity; furthermore, through partnerships with the private sector, they will be equipped to scale up this approach, scaling the associated benefits through linkages to the national adaptation strategy and Living Indus Initiative.
	Groundwater and Resilient Community Water Services – Groundwater is being extracted at unsustainable levels; this can result in lower lake levels, land subsidence and sinkhole formation in areas of heavy withdrawal. Most of existing water supply infrastructure not designed and constructed based on the aquifer recharge capacity which affects the groundwater availability for the future and damage aquifers with over pumping. In addition, their energy source is mainly main gridlines which are not available as required and most of the time using standby generators which increase the operation and maintenance cost as well as contribute for CO_2 emissions.	• The project will construct nature-based groundwater recharge facilities in the locations identified for water scarcity and depletion of groundwater which will have a positive environmental contribution by balancing the groundwater recharge and extraction and protecting aquifers from damages due to over extraction and improving ecosystem resilience. • The climate-resilient water supply systems planned by this project will be designed based on detailed hydrogeological study with solar and hand pump installations for optimum use of the groundwater as per the capacity of the aquifers. In addition, the technologies planned by the project (solar and hand pumps) are both very low operation and maintenance and no negative impact to the environment.

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Type of Benefit	Baseline	With/After Project
	EbAs – untreated wastewater from urban and semi urban areas released to the environment manly to perineal and seasonal river streams is polluting waterways and leading to ecosystem destruction and subsequent biodiversity loss, negatively impacting the health of communities.	The constructed wetlands planned by the project will have a positive environmental contribution by improving water quality, increasing vegetation cover, and creating micro-ecosystems that can increase local biodiversity.
	Surface Water Conservation – Saline and brackish groundwater and other climate-related effects have left parts of the lower Basin in a precarious situation leading to maladaptation of water extraction practices and resulting in environmental degradation and increased salinity of groundwater due to low recharge and increasing sea water intrusion.	The community ponds will support communities to have access to alternative fresh water sources and increase groundwater recharge and reduce groundwater salinity. The rehabilitated waterways will also reduce flush flooding and improve the overall ecosystem at local level.
	Adaptive capacities and empowered communities – Limited institutional capacity for enforcing environmental laws and regulations, limited knowledge on environment friendly practices at local level and limited knowledge platforms on introducing and promotion of innovative and environment friendly technologies.	The institutional capacity building, activities, KM products and platforms and awareness creation activities will have a positive contribution to the environment by building the capacity for monitoring and enforcement of environment laws and regulations, enhanced awareness, knowledge, skills and improved positive practices in the targeted communities will contribute to maintain a clean, socially sustainable environment in target locations with a potential adaptation by neighbouring districts and villages.

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Annex 8: Summary of Climate Hazards and Underlying Vulnerabilities in Project Areas

1. Gilgit-Baltistan

Climate Change Hazard	Impact on Community	Underlying Vulnerability / Barriers to Adaptation	Target Community Affected	Activity Proposed
Cryosphere hazards including GLOFs	Potential GLOFs, leading to downstream flooding, infrastructure damage, and community displacement.	high-risk zones due to the proximity of glacier lakes, inadequate infrastructure resilience, and limited early warning systems.	Ishkoman Valley, Manjawa Valley, Sher Qilla valley, Hasaan Abad valley, Shimshal valley, Bagrot Valley,	Community-based Comprehensive mapping and monitoring of glacier lakes in the identified valleys. Installation of early warning systems to alert communities in the event of potential GLOFs. Development of community-based inclusive and gender-transformative adaptation plans to enhance resilience and preparedness. Capacity-building initiatives for local government and communities on GLOF risks and response measures. Collaboration with relevant authorities for coordinated emergency response planning and execution.
	Increased vulnerability due to limited community engagement, resource constraints, and policy challenges heightens the risk of cryosphere-related hazards, potentially resulting in unpreparedness and adverse impacts on communities.	Increased risk of inaccurate vulnerability assessments, compromised adaptation effectiveness, and resource impediments may create high-risk zones for cryosphere-related hazards, characterised by weakened infrastructure resilience and limited early warning systems.	Ishkoman Valley, Manjawa Valley, Sher Qilla valley, Hasaan Abad valley, Shimshal valley, Bagrot Valley,	Vulnerability and exposure assessment of communities to cryosphere hazards, coupled with assessment of resilience practices and solutions of communities. Identification of potentially hazardous glacier lakes through collective efforts, ensuring the selected communities are better prepared to cope with climate change-induced disasters, based on insights gained from collaborative work and initiatives that strengthen the adaptive capacities of the communities including women and youth.
	Heightened vulnerability resulting from limited leadership, insufficient evidence, and coordination challenges may lead to delayed effective response and reduced community resilience in the face of cryosphere-related risks.	High-risk scenarios for cryosphere-related hazards emerge when there's limited leader involvement hindering effective risk addressing, insufficient evidence use impacting disaster response accuracy, and coordination challenges impeding CB-MEWS integration and broader preparedness efforts.	Ishkoman Valley, Manjawa Valley, Sher Qilla valley, Hasaan Abad valley, Shimshal valley, Bagrot Valley,	Involve leaders to address cryosphere risks in flood zoning and infrastructure planning. Use evidence, including the resilience practices and solutions of communities, to create disaster response recommendations. Advocate for standardised implementation. Coordinate with Disaster Agencies for CB-MEWS integration and up scaling for broader preparedness.

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Deleted: Summary of climate hazards and underlying vulnerabilities in the target areas

2. Khyber Pakhtunkhwa

Deleted: Table 6: Summary of climate hazards and underlying vulnerabilities in the target areas

Climate Change Hazards	Impact on Community	Underlying Vulnerability / Barriers to Adaptation	Target Community Affected	Activity Proposed
An erratic rainfall patterns. Droughts	Groundwater (including Springs) depletion. Limited water resources	Lack of adequate safe water sources Contamination of groundwater resource	Abbottabad District, Abbottabad Tehsil, (Nathia Gali) Mansehra District, Shinkiari Tehsil Lower Dir District, Adenzai Tehsil Swat District, UC Bara Bandai UC Beha Bulkarai Fazal Banda Rodingar Tangar Babuzai Tehsil /Saidu Sharif	Output 2.1 Output 2.2 Output 3.1 Groundwater study and mapping Construction of groundwater recharge facilities Construction of ditches and trenches for groundwater recharge from runoff Installation of water quality meters Establish and train community-based structure for O&M of recharge facilities. Develop technical training courses for the Local Government
Floods	Damages on water supply facilities Pollution of wells Public health risks due to lack of access to safe drinking water that hit most the marginalised populations GBV risks for girls and women due to locations and distance to water point	Excessive dependency on fossil-fuelled generator Excessive operation and maintenance cost Lack of knowledge and skills Long time to fetch water	Swat District, KP Province Bahrain Pashtonai Kalay Shatkal Utror Charsadda District, KP Province Agra Battagram Shabara Utmanzai Tarnab Nowshera District, KP Province Akbar Pura Amankot Amangarh Chowki Town Kaka Sahib Muhib Banda Nawan Kalli Pabbi	Output 3.2. Assessment of flood-affected vulnerable districts that take into consideration the gendered vulnerabilities Construction of solar-powered water supply facilities Establishment of community water management structure with training for WASH committees that promote women's inclusion and participation in community water management.

Climate Change Hazards	Impact on Community	Underlying Vulnerability / Barriers to Adaptation	Target Community Affected	Activity Proposed
Cryosphere hazards including GLOFs	Potential GLOFs, leading to downstream flooding, infrastructure damage, and community displacement.	high-risk zones due to the proximity of glacier lakes, inadequate infrastructure resilience, and limited early warning systems.	Chitral District Reshun Valley (Upper Chitral) Kalash Valley (Lower Chitral)	Community-based Comprehensive mapping and monitoring of glacier lakes in the identified valleys. Installation of early warning systems to alert communities in the event of potential GLOFs. Development of community-based and gender-responsive adaptation plans to enhance resilience and preparedness. Capacity-building initiatives for local government and communities on GLOF risks and response measures. Collaboration with relevant authorities for coordinated emergency response planning and execution.
	Water body contamination Public health risks due to overflow of untreated wastewater that hit most the marginalised populations	Non-existence of sewage and wastewater treatment system	Swat District, KP Province Mingora Charsadda District, KP Province Shabqadar Nowshera District, KP Province Pabbi	Output 4.1. Secondary WASH, Environmental and climate change data analysis Environmental and feasibility assessment in target sites Output 4.2. Construction of wetlands Capacity building for the Government and community on O&M of wetlands Technical support on innovative and lateral learning platform

3. Sindh

Deleted: Table 8: Summary of climate hazards and underlying vulnerabilities in the target areas

Climate Change Hazards	Impact on Community	Underlying Vulnerability / Barriers to Adaptation	Target Community Affected	Activity Proposed
Floods	Damages on water supply facilities Pollution of wells Public health risks due to lack of access to safe drinking water GBV risks for girls and women due to	Excessive dependency on fossil-fuelled generator Excessive operation and maintenance cost Lack of knowledge and skills Long time to fetch water	Khairpur District, Sindh Bhelaro Deh Sohu Fatehpur Gambat Town Kot Diji Town Rasoolabad Mirpurkhas District, Sindh Chetori Hussain Bux Mari Hangoro	Output 3.2. • Assessment of flood-affected vulnerable districts • Construction of solar-powered water supply facilities • Construction of climate-resilient handpumps • Establishment of community water management structure with training for WASH committees

Climate Change Hazards	Impact on Community	Underlying Vulnerability / Barriers to Adaptation	Target Community Affected	Activity Proposed
	locations and distance to water point		Ismail Khumbhar Jhurbi Kangoro Khumbri Makhan Samon Meer Fateh Khan Mir Ali Bux Talpur Mir Khuda Bux Old Mirpur Sarhal Tajo Khaskheli Sujawal District, Sindh Akbar Shah Jhok Shareef Kandhor Koti Mirpur Bathoro Shah Mohammad Shah Sukkur District, Sindh Saeedabad Wah Burira Umerkot District, Sindh Debho Faqeer Abdullah Gulzar e Khalil Khan Sb Atta Muhammad Palli Kharoro Sayed Mir Walli Mohd Talpur Sabho Samro Road Satryion Walli Dad	
	Water body contamination Public health risks due to overflow of untreated wastewater	Non-existence of sewage and wastewater treatment system	Khairpur District, Sindh Dhonbut Pur Mirak Pir Hayat Shah Sagyoon Sukkur District, Sindh Wah Burira	Output 4.1. • Secondary WASH, Environmental and climate change data analysis • Environmental and feasibility assessment in target sites Output 4.2. • Construction of wetlands

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Climate Change Hazards	Impact on Community	Underlying Vulnerability / Barriers to Adaptation	Target Community Affected	Activity Proposed
				• Capacity building for the Government and community on O&M of wetlands • Technical support on innovative and lateral learning platform
	Breakage of waterways and drainages	Limited restoration capacity Lack of DRR measures	Sanghar District, Sindh Province Chotiario Sethar Pir Umerkot District, Sindh Province Doronaro Umerkot	Output 5.1. • Feasibility study on ground-truthing of catchment and restoration of ponds • Preparation of detail designs and BOQs for community ponds Output 5.2. • Restoration and rehabilitation of natural waterways
An erratic rainfall patterns. Drought	Drought Groundwater depletion Limited water resources	Lack of reliable water sources Contamination of groundwater resource	Sanghar District, Sindh Province Chotiario Tharparkar District, Sindh Province Chachro Islamkot Kahri Mithi Mithrio Posarko Sobyar Umerkot District, Sindh Province Doronaro	Output 5.1. • Feasibility study on ground-truthing of catchment and restoration of ponds • Preparation of detail designs and BOQs for community ponds Output 5. 2 • Installation of automatic water quality monitoring systems • Construction of communal ponds • Establishment of communal pond management committees and promotion of climate adaptation by communities

Annex 9: Component-Specific Benefits of the Project

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Output	Target Area	No. of Beneficiaries	Cost per Beneficiary (US$)	Economic Benefit	Logic
1.1: Integrated cryosphere risk mapping through community engagement.	Ishkoman Valley Manjawa Valley Sher Qilla Valley Hassan Abdal Valley Shimshal Valley	70,500	24.27	Information on location specific exposure to risks made available to the community, local leaders, and through Component 6 to provincial and national authorities	Cryosphere hazards are rapidly changing and evolving phenomenon, and accordingly a localised risk mapping, the specific community-based monitoring is required.
1.2: Community-based monitoring and early warning systems established.				Loss of life mitigated through disasters. Destruction of infrastructure and new construction due to disaster mitigated.	Through land use planning practices and policies that consider cryosphere hazards, the destruction of property incurred by new construction can be mitigated.
1.3: Strengthened resilience to cryosphere-related risks.					Cryosphere hazards such as GLOFs occur with very little warning; linking expert analysis to CB-MEWS will increase the time of warning before reducing the loss of life.
2.1: A comprehensive web-based information management system of springsheds and springs prepared for Malakand and Hazara divisions.	Swat (Babuzai) Lower Dir (Adenzai) Abbottabad (Nathia Gali) Mansehra (Shinkiari)	135,000	6.91	Rural and municipal water supplies relying on springs are stabilised in terms of availability and improved in terms of quality, reducing loss of income due to water scarcity.	Springs in the intervention area are drying up; revitalising these springs can buffer the climate-induced increase volatility of precipitation without the construction of expensive large infrastructure, rather using the existing natural subterranean aquifer formations.
2.2: Recharge measures (for improved springshed practices, land use planning, and bioengineering) co-developed and implemented.					Practices that ensure waste disposal on the springshed is prohibited, and that small-scale catchments over the springshed at hydro-geologically determined locations increase the rate of recharge.
2.3: Local governance framework for springshed established with enhanced institutional capacity for efficient water resource management.					Finally, when combined with flow monitoring and water use governance, the cost efficacy gains are leveraged and sustained.
3.1: Groundwater mapping and	Swat	30,000	14.6	Conservation and recharging of groundwater	By actively managing and preserving groundwater resources, the communities ensure the long-term

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Output	Target Area	No. of Beneficiaries	Cost per Beneficiary (US$)	Economic Benefit	Logic
groundwater recharge facilities completed in selected water-scarce locations in the middle basin, including establishing/ strengthening operation, maintenance, and management structures.				in Khyber Pakhtunkhwa Province of Pakistan yield economic benefits through sustainable and inclusive water management, empowering communities to enhance water availability for economic purposes, reducing income volatility and water security caused by water scarcity, and enabling local policymakers to plan resilient and inclusive water-dependent income creation investments.	availability of water for various uses. Sustainable and inclusive practices for groundwater management help maintain water levels at a sustainable rate, preventing overexploitation and depletion. This ensures a continuous and reliable water supply, which is crucial for economic activities and benefit for whole society.
3.2: Climate-smart and resilient water supply infrastructure established in selected sites, along with contextually relevant management structures with adequate capacity for operation and maintenance of the community infrastructure.	Sindh - Mirpurkhas, Umerkot, Sujawal, Badin, Khairpur and Sukkur districts Khyber Pakhtunkhwa Charsadda, Swat and Nowshera districts	165,000	12.4	Green and climate-resilient community water supply facilities will provide economic benefits by reducing operation and maintenance costs and reducing cost of reconstruction due to damages because of climate change disasters like flooding. Sustainable water services improve the water security of the communities and also reduce HH medical costs. In addition, the time saving from fetching water can also be used for other economic activities by communities, especially women. By engaging communities for construction works, the project will contribute for building local knowledge and skills and create	The logic for the economic benefit of the climate-resilient community water supply infrastructure is that making them resilient reduce the cost of recurrent reconstruction after every heavy monsoon season. Using green and low-cost energy alternatives like solar and handpumps reduce operation and maintenance and in turn reduce cost of water for households.

Output	Target Area	No. of Beneficiaries	Cost per Beneficiary (US$)	Economic Benefit	Logic
				livelihood for community members while fostering inclusion.	
4.1: Targeted intervention sites identified for evidence-based, climate adaptive and focused WASH interventions.	KP: Charsadda, Swat and Nowshera districts Sindh: Sukkur and Khairpur districts	NA	NA	Data on feasibility of construction of wetlands will be available for targeted districts with estimated costs which will be available for government and other development partners to use for implementation which will save time and money for other partners that may be used for feasibility studies. The document can also be used for resource mobilisation that can bring additional resources in the targeted areas which will have economic benefits	By having comprehensive study in targeted areas, the project will help not only identifying sites for implementation by this project but also additional sites for future implementation of similar projects. These readily available projects will help the local governments and CSO to mobilise additional resources
4.2: NbS for sewage treatment demonstrated through constructed wetlands along with proper management structures and adequate capacity for operation and maintenance of wetlands.	Khyber Pakhtunkhwa Province Charsadda, Swat and Nowshera districts Sindh Province - Sukkur and Khairpur districts	22,400	19.65	Constructed wetlands act as natural filters that efficiently remove pollutants and contaminants from household effluent. By treating and reusing household effluent through constructed wetlands, the demand for freshwater resources is reduced. This conservation of water resources is particularly crucial in areas facing water insecurity and increasing urbanisation. Constructed wetlands contribute to climate change resilience by serving as a sustainable wastewater management	Constructed wetlands can be cost-effective compared to conventional wastewater treatment systems. They often require less energy and maintenance, and the construction materials can be locally sourced. This makes them a more affordable and sustainable option, especially for communities with limited financial resources.

Output	Target Area	No. of Beneficiaries	Cost per Beneficiary (US$)	Economic Benefit	Logic
				solution. They can accommodate fluctuating water flows, including heavy rainfall events and periods of drought, thus providing resilience to changing climate conditions.	
5.1: Government of Sindh supported in systematically prioritising 15 natural waterways and community water ponds to address water storage and wastage issues.	Sindh Province-Sujawal, Umerkot, Tharparkar and Sanghar districts	NA	NA	Comprehensive study output will help to have appropriate and optimum designs of restoration activities which will have an economic benefit by recommending cost effective and contextualised solutions that take into account local and Indigenous practices which reduces inefficient use of resources for construction and restoration	The logic is by spending some funding for comprehensive study it will have an economic benefit for the project as it will reduce the risk of design and construction mistakes and make right investment for different components of the project
5.2: 15 selected waterways/ponds in Sindh Province restored/rehabilitated, including installation of water quality monitoring systems and establishing and strengthening operation, maintenance, and management structures.	Sindh Province-Sujawal, Umerkot, Tharparkar and Sanghar districts	30,000	32.5	Surface water conservation practices will help to increase freshwater availability and improve groundwater quality through increased recharge. This will reduce cost of water treatment as surface water need simple filtration while saline groundwater in the target areas needs expensive treatment options like reverse osmosis systems. Increased water availability improve access to water supply for hygiene, sanitation and other domestic use which will	The cost-effectiveness of EbAs, such as community ponds and rehabilitated waterways, stems from lower infrastructure costs, sustainable maintenance requirements, multiple co-benefits, community participation and ownership, resilience and flexibility, and risk reduction. These factors make these approaches economically efficient for communities to adapt to climate change.

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Output	Target Area	No. of Beneficiaries	Cost per Beneficiary (US$)	Economic Benefit	Logic
				improve health conditions and water security of communities especially of women. Community ponds and rehabilitated waterways contribute to increased water availability for economic activities, including agriculture, livestock, and aquaculture. This supports income generation and food security within the communities. By managing water resources effectively, communities can mitigate the negative effects of climate variability, maintain stable agricultural production, and sustain livelihoods and social services.	
6.1: National and provincial capacities strengthened to apply innovative social and technological tools for establishing and enforcing human-centred and gender-transformative systems of climate change adaptation and accelerating the progress towards management of Indus water resources.	Federal - MoCC&EC and MoWR Provincial – Sindh, KP and GB	NA	NA	Federal, provincial, and district-level government institutions supported to develop and enforce adaptive and inclusive policies guidelines and regulations which will reduce cost of expenditure for emergency responses, increase government revenue for other capital investment and increase access to water supply services in unreached communities and support equitable water supply services across the target locations. Improved efficiency of project implementation and, reduced duplications and	The logic of the economic benefit of this intervention is by investing on strengthening both technical and adaptive capacities for implementation and enforcement of inclusive policies and regulatory frameworks that are locally informed and gender-responsive can reduce misuse of water resources, which in turn, increases water availability for other activities that will lead to additional economic benefits. Particularly, the adaptive capacities that strengthen the collaboration at all levels and bridge the districts-national level as well as community level can foster developing and implementing systemic and multi-partner solutions to climate mitigation that can lead to further economic gains. In addition, charging fees for heavy water users such as commercial agriculture and industrial, can create additional revenue, which can help for capital investment to expand coverage and reach more vulnerable people with services.

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Output	Target Area	No. of Beneficiaries	Cost per Beneficiary (US$)	Economic Benefit	Logic
				increased financing for the country for climate change adaptation.	Moreover, improved coordination, inclusive practices, Information management, and evidence generation capacity at federal and provincial level can have an economic benefit by improving efficiency and collaboration, reducing duplications, and unlock new financing for climate change adaptation.
6.2: National and provincial stakeholders have access to strengthened evidence-based data and knowledge for informed decision-making and implementation of climate adaptation and mitigation that foster collaboration across sectors.	National Sindh KP GB	NA	NA	Increased investment for climate adaptation projects, lower cost of piloting similar approaches and technologies in different locations and increased knowledge and skills of practitioners.	The logic of the economic benefit of their output is that available, evidence-based data, knowledge products, and inclusive platforms for knowledge and experience sharing can demonstrate effectiveness and thus increase investments for climate adaptation. Moreover, evidence-based data and knowledge sharing can improve efficiency as it leads to focused intervention based on experience of the communities, especially when taking into consideration of the experiences of women and youth, allowing localised solutions and interventions, which will have further economic gains. Potential of knowledge and skill transfer to other locations outside the targeted districts but also regionally is further extending the positive impact and attract climate financing to Pakistan.
6.3: Youth and women's leadership as well as Community-led adaptation solutions strengthened in climate action through awareness-raising and behavioural change campaigns.	Sindh KP GB	900,000	0.6	Reduced exposure and impact of climate change hazards for communities and households which in turn reduce household and aid expenditure for relief and reconstruction. In addition, enhanced knowledge and awareness will lead to improved, inclusive, and socially sustainable practices and reduce household expenditures on treatment	The logic for the economic benefits for this output is that enhanced awareness on impact of climate change and participation of women and youth in resilient adaptation practices can reduce the exposure and impact of climate change hazards and in turn reduce economic losses but also offer avenues for new practices that provide new revenues for the communities and the districts. Furthermore, fostering the youth and women's participation in the climate adaptation will bring economic benefits as it allows for a more comprehensive and diverse approaches, levering their local and culturally appropriate approaches,

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Output	Target Area	No. of Beneficiaries	Cost per Beneficiary (US$)	Economic Benefit	Logic
					ultimately leading to better outcomes through harnessing the full potential of society Additionally, stronger community ownership of the climate adaptation initiatives and practices can lead to better maintenance, responsible management of resources as communities will be more invested in the success and sustainability of the interventions, which will have economic benefits but moreover it can lead to more proactive approach attracting investments to the districts.

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Project Components / Outcomes ... [160]

Annex 10: Complementarity to Contemporary Initiatives

Relevant Project	Description	Goals	Complementary potential	Actions to Avoid Overlap	Project Timeline
Clean Green Pakistan	The CGCP is designed to seek the participation of the citizens voluntarily for keeping the cities clean, improving civic amenities, and creating in them the spirit and sense of owning their habitats and cities. Any citizen of Pakistan aspiring to be the Clean Green Champion will volunteer to contribute to activities under the following five key pillars of the Clean Green Pakistan Movement.	Strengthen the knowledge and practices among communities about cleanliness and climate change. Ensure the voice of participation of the people as an integral part of Clean Green Pakistan. Empower the local councils to monitor and review their cities on set performance indicators.	The proposed project will support the generation of knowledge relevant to communal DRR, water management, and adaptive measures. The proposed project will provide support at the local level empowering local authorities to lead on climate adaptation.	No overlap- This is an initiative for coordination and structured approach for institutional and community mobilization no specific project	2018 – (no set end date)
Living Indus	an umbrella initiative and a call to action to lead and consolidate initiatives to restore the ecological health of the Indus within the boundaries of Pakistan, which is most vulnerable to climate change. Extensive consultations with the public sector, private sector, experts, and civil society.	Mobilise a movement of ideas and action at every level of state and society that aspires to repair and restore a thriving and healthy Indus for today and tomorrow.	The proposed project complements this initiative by feeding into 10 of the 25 preliminary menu interventions.	No overlap- The project designed in coordination for the coordination team of the initiative and designed to contribute critical interventions of the initiative.	2022 – (no set end date)
The Resilient Recovery, Rehabilitation, and Reconstruction Framework Pakistan (4RF)	The 4RF document provides programmatic priorities, policy framework, institutional arrangements, financing strategy, and implementation arrangements for resilient recovery, rehabilitation, and reconstruction in the aftermath of the 2022 floods. Urgent actions have been proposed to meet these needs.	Ensure that transformational measures are implemented to ensure resilient recovery and reduce the impact on developmental gains so as not to hinder the progress of future generations. It also provides a foundation for the country to build and strengthen long-term resilience to climate-induced disasters.	The 4RF may be an important source of community-level vulnerability information that could inform the Government of Pakistan's selection of priority pilot communities for the . The UN Women contribution to this project under Component 6 will be key in this regard.	No overlap- this is the overall reconstruction and resilience farmwork developed by government and its partners not a specific project for flood recovery. Output 3.2 Interventions contributing to 4RF in coordination with other partners to avoid overlap	2022 – 2029 (approximately)
Scaling Up of GLOF Risk Reduction in Northern Pakistan	This is a UNDP-implemented continuation of the four-year 'Reducing Risks and Vulnerabilities from GLOF in Northern Pakistan' (GLOF-I)	Empower communities to identify and manage risks associated with GLOFs and related impacts of climate change, strengthen public	The proposed project cryosphere will complement the current geographic coverage of GLOF Phase II and link the communities to a community led		2017 - 2023

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Relevant Project	Description	Goals	Complementary potential	Actions to Avoid Overlap	Project Timeline
	project. GLOF-I helped vulnerable communities prepare for and mitigate GLOF risks through Community-Based Flood Early Warning Systems (CBFEWS), enhanced infrastructure and community-based disaster risk management. ICIMOD has provided considerable technical support to this project.	services to lower the risk of disasters related to GLOFs, and improve community preparedness and disaster response. The project will also support the development of sustainable livelihood options.	DRR system that reaches further downstream, leveraging the impact of GLOF and increasing the cost-effectiveness of the proposed Project.		
Transforming the Indus Basin with Climate-Resilient Agriculture and Water Management	GCF-funded FAO-implemented project will develop the country's capacity to use information it needs to adapt to climate change impacts on agriculture and water management with state-of-the-art technology; build farmers' climate resilience through skills, knowledge, and technology.	Transform agriculture in the Indus Basin by increasing resilience among the most vulnerable farmers and strengthening government capacity to support communities to adapt.	The proposed project will increase the availability of groundwater, which is essential for irrigation. Furthermore, the 's community led DRR mechanisms will serve to mitigate some degree of crop loss.	No overlap- the project is focusing on agriculture sector with a water management component. The water management component planned in different geographic locations from AF fund small scale water management activities	2019 - 2026
Enhancing community, local and national level urban climate change resilience to water scarcity, caused by floods and droughts	This Adaptation Fund-supported and UN-Habitat implemented project is focused on resilient water harvesting facilities and district/city-level spatial strategies to assess climate change-related floods, droughts, and water scarcity to plan for and manage climate change risks.	The main objective of the proposed project is to "enhance community, local and national-level urban climate change resilience to water scarcity, caused by floods and droughts in Rawalpindi and Nowshera cities."	Scaling of solutions on water conservation and managing climate change risks piloted at Nowshera and Rawalpindi in the larger areas through collaboration with national and provincial agencies.	No overlap- the project is focusing on urban areas and different geographic location from AF project	2020-2023
Recharge Pakistan: Building Pakistan's resilience to climate change through Ecosystem-based Adaptation (EbA) and Green Infrastructure for	By This GCF funded project seeks to reduce flood risk and enhance water recharge at six sites in the Indus Basin, building resilience of 10 million people and vulnerable ecosystems. It does so across 3 Components: 1. Ecosystem-based adaptation for integrated flood risk management	The primary objective of this GCF initiative is to transform the country's approach to flood and water resource management in local watershed sites in the Indus Basin River system. This will be accomplished by implementing EbA and green infrastructure interventions, as well as enhancing community-	There are significant opportunities to leverage mutual learning across component 3 of SAFER and Component 3 of Recharge Pakistan. Furthermore, Component 6 of SAFER will enable Recharge Pakistan to integrate its outcomes into the Living Indus Initiative.	No overlap – The project targeting different locations and no geographic overlap	2023-tbd

Relevant Project	Description	Goals	Complementary potential	Actions to Avoid Overlap	Project Timeline
integrated flood risk management	2. Enhancing the resilience of vulnerable communities to climate change 3. Enabling a paradigm shift towards ecosystem-based adaptation in Pakistan	based natural resource management. These activities will address long-term drought and flood resilience, while establishing a paradigm shift for future EbA initiatives in Pakistan.			
WB-Integrated Flood Resilience and Adaptation project for Pakistan	The project comprises of six components. community infrastructure rehabilitation will finance the rehabilitation of priority community infrastructure damaged by floods, including irrigation and flood protection infrastructure, water supply schemes, roads, bridges, and small community facilities located in calamity-declared districts of Balochistan. It consists of following sub-components: (i) rehabilitation of irrigation and flood control infrastructure; (ii) restoration of water supply schemes; (iii) reconstruction and rehabilitation of roads and bridges; and (iv) restoration of small community facilities.	The project development objective (PDO) is to improve livelihoods and essential services and enhance flood risk protection in select ed communities affected by the 2022 floods.	Complementarity as exchange of knowledge and resources with this project, enhanced government capacity and increased coverage of people with combined efforts.	No Overlap- The project implementing departments are informed on the targets of AF project and which will be considered while finalizing targets for this project. In addition, the project will participate in coordination platforms for this WB project during the detailed project specific designs to avoid geographic overlap	2023-2028
WB- Sindh Flood emergency Rehabilitation project	The WB project development objectives are to: (a) rehabilitate damaged infrastructure and provide short-term livelihood opportunities in selected areas of Sindh province affected by the 2022 floods; and (b) strengthen the Government of Sindh's capacity to respond to the impacts of climate change and natural hazards.	Establishing resilient infrastructure and institutional setup in flood affected location in Sindh	The project capacity building interventions for the province will complement the AF project by enhancing capacity for monitoring and quality assurance. Experience sharing on the project approach and technology	No overlap- The project mainly focusing on rehabilitation of public water supply systems and the AF project target locations selected to ensure there is no geographic overlap with this project.	2023-2027

Relevant Project	Description	Goals	Complementary potential	Actions to Avoid Overlap	Project Timeline
WB- Khyber Pakhtunkhwa Rural Investment and Institutional Support project	to strengthen state capabilities for delivery of basic services and climate resilient infrastructure in the project areas, including for the poor and vulnerable	Capacity Strengthening of Provincial Government departments and construction of resilient basic social service infrastructure	The project capacity building interventions for the province will complement the AF project by enhancing capacity for monitoring and quality assurance. Increased impact with complimentary activities.	No overlap – The AF fund project interventions and locations identified taking consideration of this project targets	2023-2029
ADB - Preparing Water and Urban Development Projects	To respond to urban and water sector development challenges in Pakistan through the delivery of upstream urban sector analysis, investment strategy, quality project preparation for a number of ensuing projects in 4 provinces of the Pakistan	Technical Assistance, evidence generation and Capacity Building for urban and water sector in All 4 provinces of Pakistan	Complementing the AF project with enhanced capacity of the water sector in Sindh and KP where the AF project is targeting	No overlap- The project mainly focusing on evidence generation and institutional capacity building	2024-2026

Annex 11: Knowledge Management Plan

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Output	Knowledge Products	Potential Knowledge Users
Output 1.1: Integrated cryosphere risk mapping through community engagement.	• Updated Glacier Lakes, GLOFs, Glaciers, Snow, and Permafrost Database: • This knowledge product focuses on the consolidation of diverse datasets including glacier lakes, glacial lake outburst floods (GLOFs), glaciers, snow cover, and permafrost into a single, comprehensive database. This will streamline information retrieval for users, minimizing redundancy and facilitating easy access to the necessary data. The database will serve as a valuable resource for risk assessment, mitigation planning, and the formulation of adaptation strategies. Users can obtain critical information relevant to cryosphere-related risks, enabling informed decision-making and enhancing the overall effectiveness of cryosphere management initiatives. The database will serve a wide range of stakeholders engaged in understanding and addressing cryosphere-related challenges.	• Government agencies: Ministry of Climate Change, National and Provincial Disaster Management Authorities, Pakistan Meteorological Department, and water and power development authority could use the database for regional scale risk assessments, mitigation plans, and adaptation strategies for cryosphere-related hazards. • Research institutions Universities and research institutes could use the database to study the impacts of climate change on the cryosphere in Pakistan and to develop new methods for monitoring and predicting cryosphere-related hazards. • Non-governmental organizations (NGOs):NGOs working in disaster risk reduction and climate change adaptation could use the database to raise awareness of cryosphere-related hazards and to develop community-based risk reduction programs in other parts of northern Pakistan. • Communities: The general public could use the database to learn about cryosphere-related hazards and to take steps to protect themselves and their property. • Private sector: Companies involved in infrastructure development, water resources management, and disaster insurance could use the database to assess the risks posed by cryosphere-related hazards and develop strategies for managing those risks.
Output 1.2: Community-based monitoring and early warning systems established.	• Integrated Cryosphere Risk Management and Adaptation Guide: • The integrated guide is proposed to be designed for diverse communities, placing a strong emphasis on specific community needs. It incorporates successful case studies from various locations, providing valuable insights for users. The guide not only facilitates the risk assessment and management process with clear instructions but also identifies and prioritizes adaptation options for communities facing cryosphere-related risks. Clear and concise implementation instructions are provided for each adaptation strategy, simplifying practical application for communities. The guidelines will be translated into local languages, ensuring broader accessibility	• Community Leaders: Empowered with this guide, community leaders can strategically develop and execute cryosphere risk reduction and monitoring plans for the specific needs of their communities. The guidelines provide a practical framework for community leaders to safeguard their residents and resources. • Disaster Risk Reduction Practitioners: Professionals in disaster risk reduction can leverage the guide as a valuable resource for offering technical assistance to communities. The guide equips practitioners with clear insights and methods to enhance cryosphere risk reduction and monitoring initiatives, fostering resilience in vulnerable areas. • Policymakers: Policymakers can utilize the guidelines as a foundation for formulating comprehensive policies and regulations that actively promote effective cryosphere risk reduction and monitoring. This ensures that governmental

Output	Knowledge Products	Potential Knowledge Users
	and widening the audience reach for effective cryosphere risk management and adaptation. This integrated guide serves as a comprehensive resource for diverse stakeholders, ranging from community leaders and practitioners to policymakers and researchers.	decisions align with the best practices outlined in the guide, contributing to long-term community resilience. • Researchers: Researchers find value in this guide by utilizing it as a reference for developing innovative methods and tools for cryosphere risk reduction and monitoring. The comprehensive insights provided can inform research endeavours, driving the creation of cutting-edge solutions in the field. • Communities (General Public): Accessible to the general public, the guide serves as an educational tool. It empowers individuals to understand the nuances of cryosphere risk reduction and monitoring, enabling them to proactively take steps to protect themselves and their property. The inclusion of engaging case studies facilitates a broader understanding of practical applications.
Output 1.3: Strengthened resilience to cryosphere-related risks.	• Cryosphere Risk Data and Information Portal: This online portal will provide communities with a user-friendly interface that makes it easy to find and access data. This will encourage more people to use the portal. • Provide data on hazards, past disasters, and community demographics. This will give users a better understanding of the risks they face. • Include tools for visualizing and analysing data. This will allow users to explore the data and identify trends.	• Community leaders; Disaster risk reduction practitioners; Policymakers; Researchers; General public
Output 2.1: A comprehensive web-based information management system of springsheds and springs prepared for Malakand and Hazara divisions.	• The comprehensive web-based information management system for springsheds and springs in Malakand and Hazara divisions is designed to enhance local resilience to climate change. This platform will integrate GPS locations, biophysical characteristics, and socio-economic data, providing a holistic view of spring resources. By centralizing diverse data, it will facilitate better resource management and planning, enabling stakeholders to monitor spring health, predict water availability, and design targeted interventions. The system, updated by government agencies, local communities, and academic institutions, will be a dynamic tool for informed decision-making	• Primary users of this system include government agencies like the Directorate General of Soil and Water Conservation (DSWC), Climate Energy & Water Research Institute (CEWRI), Pakistan Council of Research in Water Resources (PCRWR). These agencies will use the platform to compile and analyse data, assess water quality, and develop mitigation strategies. Local communities will track water resources and engage in management practices, while public health engineering departments will utilize hydrological maps for infrastructure planning. Academia will use the data for research and capacity-building, fostering a collaborative approach to water resource management in Khyber Pakhtunkhwa.

Output	Knowledge Products	Potential Knowledge Users
Output 2.2: Recharge measures (for improved springshed practices, land use planning, and bioengineering) co-developed and implemented.	• Peer review article on cost benefit analysis: Scholarly articles that rigorously examines the economic and social impacts of the springshed management project. It will present detailed findings on the costs incurred and the tangible and intangible benefits realized, providing a robust evidence base for future projects and funding applications. • The "Customized Spring Revival Protocol in the Context of the Mountain Region of Pakistan" is a tailored guide to enhance springshed management in mountainous areas. It integrates scientific evidence and community input to develop context-specific solutions for groundwater recharge and spring revival. The protocol details methods for creating recharge pits, trenches, absorption terraces, shallow ponds, and vegetative check dams to improve spring discharge. It also includes guidelines for monitoring and adapting these practices over time, emphasizing Nature-based Solutions (NbS) to ensure sustainable water resources.	• Decision makers, academia, policy makers and donors. • This protocol will be used by various stakeholders in the Springshed Revival and Management project. Government agencies like CEWRI, DSWC, the Provincial Irrigation Department, FWMC, and the Public Health Engineering Department will use it to develop and implement recharge solutions and provide technical inputs. Local communities and municipal committees will employ it for mobilization, solution development, and ongoing maintenance. Private sector water companies will leverage the guidelines to execute necessary services. Together, these stakeholders will enhance water resilience and sustainability in Pakistan's mountain regions
Output 2.3: Local governance framework for springshed established with enhanced institutional capacity for efficient water resource management.	• Video with people's stories showing the implementation of Springshed management. • Fact Sheets and Flyers, Op-eds and Social Media Messaging: Concise, accessible documents that provide essential information about springshed management, cost-benefit analyses, and best practices for sustainable water resource use. These materials are designed to quickly inform and educate a broad audience about the project's objectives, outcomes, and benefits. • Policy brief: A detailed document that provides an overview of the project's findings, cost-benefit analyses, and policy recommendations. It will outline the legal and regulatory changes needed to support sustainable springshed management and ensure the long-term success of water resource initiatives.	• Relevant stakeholders (policy makers to practitioners to donor community) • Local communities, municipal committees, public health departments, and general public. These stakeholders will use the fact sheets and flyers to understand the importance of springshed management and to engage in sustainable practices. • Academia, research institutions, multilateral organizations like the World Bank, ADB, UNDP, and policymakers. These stakeholders will use the peer-reviewed article to validate the project's methodologies, support funding proposals, and inform the design of similar interventions globally

Output	Knowledge Products	Potential Knowledge Users
Output 3.1: Groundwater mapping and groundwater recharge facilities completed in selected water-scarce locations in the middle basin, including establishing/ strengthening operation, maintenance, and management structures.	• A compressive groundwater resource map will be available to access the groundwater potential in district Swat and will identify key areas for groundwater recharge. • A training course developed in collaboration with Academia for groundwater recharge development technical manuals, operation and maintenance modules of the structure.	• This groundwater potential mapping exercise will help Public health engineering dept and irrigation dept to have informed decision on planning for new schemes and recharge practices to ensure sustaining of the services through existing schemes. • The training of the technician, operators and local community will be conducted involving academia. This will support building the capacity of Public health engineering dept, local govt and local community on resilient community water supply services.
Output 4.1: Targeted intervention sites identified for evidence-based, climate adaptive and focused WASH interventions.	• Detail environment and feasibility assessment plans ready for all the six selected sites.	• The local govt and Public health engineering staff are capacitated on developing similar projects in their project area and ensuring their long term sustainability.
Output 4.2: NbS for sewage treatment demonstrated through constructed wetlands along with proper management structures and adequate capacity for operation and maintenance of wetlands.	• A technical backstop mechanism is established between academia and local govt/ public health engineering to provide regular informed decisions for smooth operations of the STP. This includes development of O&M guidelines and SOPs for further dissemination to operators, technicians and local community.	• The local govt and Public health engineering staff are capacitated on developing similar projects in their project area and ensuring their long term sustainability.
Output 5.2: 15 selected waterways/ponds in Sindh Province restored/rehabilitated, including installation of water quality monitoring systems and establishing and strengthening operation, maintenance, and management structures.	• Detail environment and feasibility assessment plans are available construction of ponds, filtration units, solarized water points and handpumps • Training material developed for capacity development of the community on climate adaptation techniques/ projects.	• The local govt and Public health engineering staff are capacitated on developing similar nature based solutions using surface water conservations in their project area. • The local community is capacitated on indigenous nature-based solutions to cope the unpredictable climate change.
Output 6.1: National and provincial capacities strengthened to apply innovative social and technological tools for establishing and enforcing human-centred and gender-transformative systems of climate change adaptation and accelerating the progress towards management of Indus water resources.	• Gap analysis report on the groundwater legislation for both KP and Sindh for revision of water Act. • IWRM strategy developed for Sindh.	• The Planning and development departments in KP and Sindh are capacitated for revision of the Water Act for groundwater legislation.

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Output	Knowledge Products	Potential Knowledge Users
Output 6.2: National and provincial stakeholders have access to strengthened evidence-based data and knowledge for informed decision-making and implementation of climate adaptation and mitigation that foster collaboration across sectors	• Training material developed for the district govt staff on data collection and entry to CGPI web portal. • Catalogue, technical papers and portal ready for appropriate technologies and NBS for different Indus River basin geographical zones.	• Capacity building of the district govt staff on CGPI • Capacity development of different national and provincial govt on climate adaptation technologies and solutions.
Output 6.3: Youth and women's leadership as well as Community-led adaptation solutions strengthened in climate action through awareness-raising and behavioural change campaigns.	• Bankable project available for different nature based solutions supporting govt on PPP. • SBC materials developed for climate change adaptation	• Capacity development of govt departments on development of bankable projects on nature based solutions. • SBC material to be used for engagement with youth, private sector and decision makers in the govt.

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Annex 12: Stakeholder Consultations

1. Consultations held with Governmental and Development Stakeholders

Date	Stakeholder incl. Role/Function	Consultation Objectives	Outcome	Conclusion
14.12.2023	UN Coordination office and other UN agencies in Pakistan	UNICEF undertook consultation to 1. brief UN agencies details of the SAFER proposal 2. To review the overlaps and complementarities with other initiatives	1. The upcoming UNEP project in the Sindh Province confined only to the riverine forests of Sindh 2. While there are thematic complementarities of other initiative, but SAFER project geographic coverage is distinct.	Continuing close engagement with UN agencies for complementarities and cross learning
14.12.2023	Provincial Disaster Management Authority KP Province	ICIMOD undertook consultation to: 1. brief the Director General and his team on the SAFER Project 2. Seek guidance on engagement related to implementation	1. DG and his team in PDMA KP Province appreciated the community skills development and community-based approach for managing cryosphere hazards. 2. DG directed the Disaster Risk Management section of the PDMA KPK to continue coordination and provide the necessary support.	PDMA KP Province ensured active engagement in the project activities including capacity building, scaling, and sustainability.
30.11.2023	Planning and Development Department of KP Province	ICIMOD and UNICEF undertook the consultation to: 1. brief Additional Secretary and his team on the SAFER Project 2. Seek guidance on the formalising the engagement.	1. P&D Department appreciated the NbS-based approach for tacking water issue in the province. 2. Initially, International Development Section (IDS) will coordinate in establishing the collaboration and later stage Water Wind will collaborate on the thematic areas.	There is a need to keep Economic Affairs, Economic Affairs Division (EAD) in the loop at the formal approval stage.
30.11.2023	Directorate General of Soil and Water Conservation (DSWC), KP Province	ICIMOD and UNICEF undertook the consultation to: 1. Briefing to Director General and team about the salient feature of the SAFER Pakistan project. 2. Review the existing capabilities useful for the project and future training needs 3. Review feasibility of the proposed sites for springs component	1. Current work of the department is mainly focusing on Water Ponds, stream bank stabilisation and terracing Check dams. Focus on spring revival is neglected area and require attention. 2. The GIS unit team of the department has high level skills and is keen in developing provincial Springs Inventory 3. The department is already implementing their activities through community engagement.	1. SAFER springs component will greatly benefit department in focusing on water resource side 2.DSWC is also see this project as an opportunity to add WASH aspects in their work which is presently missing. 3. It is suggested to replace Buner (Daggar) site with Swat (Babuzai/Saidu Sharif) due to security reasons.
03.06.2023	Pakistan Agricultural Research Council (PARC)	ICIMOD and UNICEF Pakistan undertook a consultation to: 1. Discuss the Springshed revival site selection criteria 2. Solicit input on the project design and partnership in implementation.	1. Selection of the sites should be focused on those springs that are linked to rural and municipal water supplies. 2. CEWRI provisionally expressed their interest to be the governmental partner under Component 2. 3. No concerns on compliance or risks with national legislation were identified.	1. ICIMOD will select sites in GB municipalities where springs are an important source of the municipal water supply. 2. ICIMOD will formalise its partnership with CEWRI under SAFER Pakistan during the inception phase.

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Date	Stakeholder incl. Role/Function	Consultation Objectives	Outcome	Conclusion
		3. Identify any potential concerns regarding legal compliance of the proposed approach.		
01.06.2023	Pakistan Council of Research in Water Resources (PCRWR)	ICIMOD and UNICEF undertook a consultation to: 1. Better understand the current hotspots and priorities related to groundwater recharge. 2. Identify any potential concerns regarding legal compliance of the proposed approach.	1. PCRWR collaborated with UNICEF and ICIMOD to develop groundwater recharge solutions. 2. There are no environmental risks or legislative obstacles to the scaling of the groundwater recharge methodology that were flagged 3. PCRWR successfully developed "National Water Conservation Strategy for Pakistan (2023-2027)" and suggested SAFER Pakistan to complement it.	1. UNICEF and ICIMOD will continue to apply the developed methodology. 2. No risks need be included in the national screening process related to Components 2 and 3.
02.06.2023	Pakistan Meteorological Department (PMD)	ICIMOD undertook a consultation to: 1. Select pilot site (Components 1 and 2) 2. Seek suggestions for improvements and discuss potential partnership in implementation. 3. Identify any potential concerns regarding legal compliance of the proposed approach.	ICIMOD received an update that: 1. The GLOF-II project is working at 24 priority areas vulnerable to GLOF hazard. 2. Good progress has been made on Installing Automated Weather Stations (AWS) and associated Early Warning Systems in the target site. 3. Community-Based DRM Committees in 24 valleys were formed and Community Hazard Watch Groups got strengthened.	A need to further strengthen local communities' capacity in dealing with ever increasing climate vulnerabilities.
30.05.2023	National Rural Support Programme (NRSP)	ICIMOD and UNICEF team visited NRSP headquarters to discuss the potential role of the NRSP beyond KM.	NRSP presented the updates regarding: 1. Their ongoing initiative on "Climate Resourcing Coordination Centre (CRCC)" which aims to mainstream climate action into the national economic and development strategy. 2. Their interest in synergising the initiative through SAFER project.	Taking part in the implementation of other components was considered after the award pf the project along with other local organisations engaged by the ICIMOD and UNICEF.
30.05.2023	Climate Energy & Water Research Institute (CEWRI)	ICIMOD and UNICEF Pakistan undertook a consultation with CEWRI with a view to: 1. Consult for pilot site selection (Springs with Climate, Energy and Water Resources Institute) 2. Solicit suggestions for improvements and discussed potential areas of engagement at the project execution stage.	ICIMOD successfully received: 1. A significant milestone through the execution of a spring rehabilitation pilot which enhanced water supply to the community in Kotli-Sattian. 2. A recommendation for four pilot sites in the Malakand and Hazara Division including Nathia Gali, Abbottabad district; Shinkiari, Mansehra district; Chakdara, Lower Dir district and Babuzai, Swat district.	Based on further analysis Malakand and Hazara were selected as the project sites
30.05.2023	Director MoCC&EC	UNICEF and ICIMOD undertook the consultation with the Director of MoCC to:	MoCC recommended NRSP to manage the Km of the SAFER project under Component 6 to	NRSP may become the local partner in implementing

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Date	Stakeholder incl. Role/Function	Consultation Objectives	Outcome	Conclusion
		1. Ensure that the project design of SAFER aligned with the Ministries emerging priorities. 2. Integrate the project further in the Living Indus Initiative	integrate the project fully in the Living Indus initiative.	Component 6: KM and Awareness Raising
31.05.2023	National Project Director (NPD) of the Ten Billion Trees Tsunami Programme of the MoCC, Pakistan	ICIMOD and UNICEF Pakistan met with NPD of the Ten Billion Trees Tsunami Programme of the MoCC, Pakistan.	NPD acknowledged the importance of the monitoring system initiated during 2022 by the SERVIR initiative of ICIMOD.	NPD team was ensured to reengage with ICIMOD team from next fiscal year (July 2023).
31.05.2023	Ministry of Foreign Affairs	ICIMOD and UNICEF conducted a meeting with the focal person to: 1. Brief the salient featured of the SAFER Adaptation Fund Proposal.	Ministry of Foreign Affairs, Pakistan expressed its appreciation for the work being done in the region, and sustained interest in the development of SAFER Pakistan.	The initiative like SAFER project which aligned with national priorities of Pakistan was welcomed.
01.06.2023	United Nations Development Programme (UNDP)	ICIMOD and UNICEF Pakistan consulted with UNDP for pilot site selection (Springs with High-altitude Cryosphere hazards)	ICIMOD committed to complementing the GLOF 2 sites, and work to support the operationalisation of completed Community-based Disaster Management Centres constructed by that project	Based on the discussions and additional subsequent technical input from ICIMOD scientists the following sites were selected: Ishkoman Valley, Manjawa Valley, Sher Qilla valley, Hasaan Abad valley, Shimshal valley, Bagrot Valley, Reshun Valley, Susoom Valley and Kalash Valley
31.07.2023	Deputy Director Gilgit-Baltistan Disaster Management Agency	ICIMOD conducted a key informant interview with a view to: 1. Understand existing Cryosphere related knowledge and gaps of the GB-DMA. 2. Identify priority areas of cooperation. 3. Identify capacity building needs of the GBDMA, and other relevant partners and communities regarding cryosphere hazards.	1. ICIMOD received an update on the progress of the GLOF 2 project 2. GBDMA engagement with communities in the target sites is ongoing 3. The SAFER activities would seem to complement the present course if implementation of GLOF 2 and community engagement. 4. Verify the proposed methodology aligns with the Disaster Management Act of 2010.	1. Formal partnership negotiations will be opened with ICIMOD upon the AF Board decision 2. ICIMOD will integrate the GBDMA's input into the project design
31.07.2023	Provincial Coordinator Disaster Risk Management Khyber Pakhtunkhwa Disaster	ICIMOD conducted a key informant interview with a view to: 1. Understand existing Cryosphere related knowledge and gaps of the KP-DMA. 2. Identify priority areas of cooperation and validate the identified target sites.	1. ICIMOD received an update on the progress of the GLOF 2 project 2. KPDMA engagement with communities in the target sites is ongoing 3. The SAFER activities would seem to complement the present course if	Formal partnership negotiations will be opened with ICIMOD upon the AF Board decision. ICIMOD will integrate the KPDMA's input into the project design.

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Date	Stakeholder incl. Role/Function	Consultation Objectives	Outcome	Conclusion
	Management Agency	3. Identify capacity building needs of the KPDMA, and other relevant partners and communities regarding cryosphere hazards.	implementation of GLOF 2 and community engagement 4. KPDMA has a need for increased access to scientific data and capacity building on undertaking data analytics to identify community vulnerability	The sites selected proposed by ICIMOD were validated by KPDMA and Kalash Valley has been added based on their input

2. Consultations held with Communities

Community	Proposed intervention	Outcome		Conclusion
Khariwah, from Mithi, Tharparkar (Province: Sindh) M:8 W:24 B:5 G:4	Construction/Rehabilitation of Communal ponds (Chalo Ponds), Tarai or Water Tanka	1. Intervention benefits community, especially women/girls coping with climate-induced water scarcity 2. Community shared concerns about defecation by villagers close to pond and recommended integrating awareness and community management in intervention. 3. Intervention benefits 250 Bheel households, 80 Thakar households, and communities in nearby hamlets.		Ponds development and rehabilitation intervention is well received by community and will help climate adaptation of community and feasible for implementation with community support.
Sachal Goth, Karachi & Thatta (Sindh); Yasin & Bubar Ghizer (Gilgit-Baltistan)	Scoping of perceptions of women community members of the climate adaptation and mitigation measures taken by the government as well as the human security impacts following the aftermath of the floods in 2022.	1. Focus group discussions shed light on vulnerabilities and limited opportunities of women in the face of climate disasters that have, in fact, plummeted intra-house decision-making and mobility for women. While the women recognized the importance of their empowerment to contribute to climate change adaptation efforts. 2. The consultation revealed increased livelihood insecurity of the families and women, including decreased water security and the participants highlighted the need for clean water when prompted about the immediate needs. 3. Many families and the women have resulted negative coping mechanisms: an increase in child labour was reported as children have been tasked with supplementing the family income. 4. The consultations reflected the great gap in the early warning systems: across all locations women responded that no specific medium was intact to ensure appropriate preparedness in informing locals to relocate before the floods. 5. The women reported a limitation of the government in providing resources and immediate relief to mitigate the challenges of the aftermath of the floods. In Sindh particularly, women have not	Data collection showed that gender-responsive policy implementation could enhance climate adaptation outcomes. Gender-responsive policy implementation is shown to improve climate adaptation outcomes for women by ensuring that their specific needs, experiences, and priorities are considered,	

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Community	Proposed intervention	Outcome	Conclusion
		received any assistance from the Government bodies, but the society bolstered its self-sufficiency by collectively pooling and distributing its few resources. thereby strengthening the benefits and sustainability of the climate actions.	
Aaho from Mithi, Tharparkar (Province: Sindh) M:12 W:2 B:5 G:3	Solar water system with climate-resilient wells	1. 14 dug wells rehabilitation, community-managed solar pump installation and groundwater recharge benefit climate adaptation and safe water access, especially for women and girls. 2. Address community division risk from intervention outset. No rain could lead to migration and labour shortage, posing challenge. 3. Intervention benefits 215 Meghwar, 25 Suther, and 40 Thakur households, plus nearby hamlets.	Community embraces solar wells and rainwater recharge for climate adaptation; feasible as similar well managed nearby.
Bheel colony from Shuja Abad, Mirpur Khas (Province: Sindh) M:7 W:7 B:4 G:0 Mehboob Khaskheli from Shuja Abad, Mirpur Khas (Province: Sindh) M:5 W:10 B:2 G:1 Shagan Bhogat from Shuja Abad, Mirpur Khas (Province: Sindh) M:6 W:6 B:1 G:2	Groundwater recharge and Solar water system with climate-resilient wells	1. Communities of these three villages were aware of the climate change and how it was causing health, food and water problems which required them to migrate or displace more and more recently. 2. Communities foresaw that interventions of wells development along with solar system and recharging of groundwater with rainwater will benefit them in general and women and girls in particular in terms of reducing their daily time spent of collection of water. 3. Communities expressed their concerns and requested to address the problems related to drainage of spilled water, security and maintenance of solar panels and design of groundwater recharge wells/ponds as part of the project with their participation.	Three villages of Shuja Abad district well received the proposed interventions as part of SAFER Pakistan and expressed their benefits for adapting climate change and improving their living conditions and showed support during project implementation.
Bachal Shah from New Sukkur, Sukkur (Province: Sindh) M:22 W:17 B:12 G:14	Sewage Treatment Plant	1. Bachal Shah community near Sukkur barrage is climate-aware, links changed precipitation and flooding to climate change, and is eager for proactive adaptation. 2. Both women and men recognised sewage treatment plant advantages, like reduced disease burden and cleanliness. However, they couldn't assess downstream benefits or river water quality. They identified insufficient funds as the primary hurdle for timely project completion, along with government apathy and inadequate O&M allocation as additional concerns." 3. Community proposed other interventions in area e.g., a flood protection bund/wall and drinking water filtration plant for improving their village.	Bachal Shah community sees some project benefits, is keen on government sewage plant with O&M budget. Suggests using other flood protection and water filtration measures for drinking water and waterborne disease prevention.

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Community	Proposed intervention	Outcome	Conclusion
Morad Gopang from Kot Diji, Khairpur (Province: Sindh) M:44 W:26 B:14 G:16	Surface water intake and Solar Drinking Water Supply Scheme	1. Community acknowledges climate change impact: changing precipitation, water scarcity, and groundwater depletion awareness and its adaptation. 2. Positive response to water supply scheme for area; foresees benefits for 4400+ households. 3. Concerns about future operation by government and construction quality; emphasises increased community involvement during implementation.	Proposed intervention is feasible
Malar Shaikh from Gambat, Khairpur (Province: Sindh) M:32 W:14 B:18 G:7	Constructed Wetland	1. Positive community response to intervention, especially men who support recycled wastewater for farming. Women unsure about constructed wetland. Project seen to benefit over 470 households. 2. Concerns about potential worsened drainage and funding delays if not well-implemented. 3. Community suggests climate-resilient handpumps due to yearly water contamination from prolonged monsoon.	Proposed intervention is feasible
Hafiz Dungar Jat from Jati, Sujawal (Province: Sindh) M:12 W:6 B:2 G:2 Sarvas Nagar from Sujawal, Sajwal (Province: Sindh) M:5 W:8 B:2 G:3 Haji Ali Muhammad Muchar from Sajwal, Sajwal (Province: Sindh) M:6 W:10 B:5 G:3	Development of communal Pond	1. Communities of these three villages use a common rainwater fed pond for daily water needs and were aware of climate adaptation needs due to their dependency on rain pattern. 2. Communities well received the proposed intervention to develop the pond for multipurpose used and shared many ideas and their willingness to contribute and participate in implementation of intervention. 3. Communities foresaw that project will be beneficial for more than estimated number of beneficiaries, especially for women and girls, and did not link major risks linked to its implementation	Proposed intervention is feasible
Tharo Khan Mangio from Sanghar, Sanghar (Province: Sindh) M:8 W:0 B:0 G:0		1. Community is aware of changing climate and proactively willing in adaptation actions. 2. Consultation was done only with men who saw proposed intervention very beneficial for community, especially women 3. Only major challenge can be division in community due to political or religious reasons during implementation	Proposed intervention is feasible
Ali Akbar Shah from Chotiario, Sanghar (Province: Sindh) M:8 W:0 B:0 G:0	Restoration of Waterways (Dhoras)	1. Climate-savvy community cites blocked waterways (Dhoras) impacting their lives. 2. Consultation involved only with men who saw proposed intervention very beneficial for community 3. Community suggested many options to restore the historical waterway which also fed a water channel which was very important for community	Proposed intervention is feasible

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Community	Proposed intervention	Outcome	Conclusion
Taj Muhammad Khoso M:6 W:11 B:8 G:10, Haji Sher Khan Mangrio M:6 W:10 B:4 G:4 and Pathan Mohallah M:2 W:6 B:4 G:2 from Umerkot, Umerkot (Province: Sindh)		1. Community of three villages, mostly women, along the dhora from Dornaro towards Chorr in Umerkot were constructed about the potential intervention of improving this waterway. It was very well received by the community who were able to link it with climate change. 2. Members of communities along this dhora gave many suggestions which will need more detailed technical study. The community proposed interventions included construction of ditches and ponds, strengthening of banks at places, removal of vegetation from the path of dhora etc. 3. Community guessed few possible challenges in implementation but no major one was brought up by the community	Proposed intervention is feasible
Ram Nagar from Pithoro, Umerkot (Province: Sindh) M:8 W:13 B:5 G:7	Solar water system	1. Ram Nagar village near Bachaband stop, has a large surface water fed water supply system which is non-functional due to fluctuating voltage or electricity shortage. 2. Positive response to solarising scheme for wider reach (15,000 households). Further technical study and stakeholder consultations needed for intervention design.	Proposed intervention is feasible
Bulchi from Bagrot, Gilgit (Province: Gilgit-Baltistan) M:40 W:0 B:0 G:0	Cryosphere rehabilitation	1. Participants were well informed about climate change and the need for adaptation as they were affected by GLOF climate event 2. Community members identified and prioritised possible interventions in a facilitated session for Bagrot valley, especially to adapt GLOF and its aftereffects. 3. Proposed interventions were well received, and community members made strong recommendations for implementation through participatory approaches.	Proposed intervention is feasible.
Chirai from Bagrot, Gilgit (Province: Gilgit-Baltistan) M:0 W:20 B:0 G:0			
Nowshera Kalan (Naway Kalay) from Nowshera, Nowshera (Province: Khyber Pakhtunkhwa) M:11 W:11 B:0 G:0	Solar-powered water facilities under build back better approach for flood affected areas	"Communities affected by climate events needing adaptation include: Water scarcity and contamination Reduced agriculture productivity affecting livelihoods. Spread of waterborne diseases Damaging heavy rains leading to infrastructure, livestock, and human losses Rising temperatures Benefits perceived by different gender groups from proposed interventions: MEN: 100% noted access to clean drinking water. 100% highlighted improved agricultural water availability and livelihoods. WOMEN: 35% saw control in disease prevalence. Noted reduced water-fetching burden.	Proposed intervention is feasible
Shala Khel from Nowshera, Nowshera (Province: Khyber Pakhtunkhwa) M:11 W:11 B:0 G:0	Stabilisation of Riverbank sites through vegetation		
Misal Abad from Nowshera, Nowshera	Constructed Wetlands		

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Community	Proposed intervention	Outcome	Conclusion
(Province: Khyber Pakhtunkhwa) M:11 W:11 B:0 G:0		CHILDREN: 85% expected reduced waterborne child diseases. Risks identified by community groups for proposed interventions: MEN: 75% concerned about low awareness in operating and potential solar system damage. Heavy rains may also damage the panels. In clouds it will not work, so we won't have water. WOMEN 25% noted potential community conflicts post-project completion regarding solar systems. CHILDREN 50% highlighted safety concerns, particularly electric shocks to children Proposed interventions expected to benefit about 6,770 households in KP communities. 5. Community recommendations for climate adaptation: Raise awareness and mobilise communities for climate resilience. Plantation to avoid land erosion. Advanced agriculture practices and compatible seeds No construction at river side	
Agra Payan from Charsadda, Charsadda (Province: Khyber Pakhtunkhwa) M:11 W:11 B:0 G:0	Solar Powered water facilities under build back better approach for flood-affected areas		
Barokhel Kanday from Shabqadar (Province: Khyber Pakhtunkhwa) M:11 W:11 B:0 G:0	Stabilisation of Riverbank sites through vegetation		
Lalma Dheri from Charsadda, Charsadda (Province: Khyber Pakhtunkhwa) M:11 W:11 B:0 G:0	Constructed Wetlands		
Barthana from Matta, Swat (Province: Khyber Pakhtunkhwa) M:11 W:11 B:0 G:0	Solar Powered water facilities under build back better approach for flood-affected areas		
Garhi Lagan from Bahrain, Swat (Province: Khyber Pakhtunkhwa) M:11 W:11 B:0 G:0	Stabilisation of Riverbank sites through vegetation		
Dhenkanal from Madian, Swat (Province: Khyber Pakhtunkhwa) M:11 W:11 B:0 G:0	Constructed Wetlands		

Notes: M=Men, W=Women, B=Boys, G=Girls

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Annex 13: Stakeholder Engagement Plan

Output	Stakeholder	Type	Role in the Project
1.1. Integrated cryosphere risk mapping through community engagement	Aga Khan Agency for Habitat	Non-Government Organization	Map the location of infrastructure and other assets that are vulnerable to cryosphere change
	ICIMOD	Non-Government Organization	Generate Cryosphere-Hazards Knowledge products
	ICIMOD and DMAs	Non-Government Organization and Government	Cryosphere Hazards vulnerability and risk assessment of mountain communities
	Disaster management authorities (PDMA, GBDMA)	Government agencies	Participate in workshops and other events to develop adaptation strategies
	Pakistan Meteorological Department	Government agency	To complement the GLOF-II project for cryosphere-related risk reduction
	Mountain Communities	Local Groups	Conduct traditional knowledge surveys to identify local cryosphere hazards
1.2. Community-based monitoring and early warning systems established	Mountain Communities	Community Watch Groups	Monitoring weather patterns and cryosphere hazards and respond to emerging risks.
	Mountain Communities	Community members	Hazards identification, selection of monitoring methods, and decision making
	Aga Khan Agency for Habitat and PDMA	Government and Non-Governmental Organization	Facilitate Community Engagement
	Mountain Communities	Community members	Use early warning systems, data analysis tools for real-time information using both in situ and satellite data
	Mountain Communities	Gender Groups	Identify the vulnerability and needs of women, children, and other vulnerable groups to cope with cryosphere-related hazards
	Mountain Communities	Community members & Gender Groups	Design gender responsive approach jointly with community watch groups, community members, and NGOs
	Local government and AKAH	Government Agency and NGO	Prepare evacuation plans for cryosphere-related hazards and establish evacuation routes and shelter zones
	Local government	Government Agency	Establish networking and communication channels to disseminate early warning information
	Private sectors	Registered private sector vendors	Develop and design an integrated platform to combine ground-based and satellite data to gather real-time information
	NGOs and Disaster Management authorities	Government agencies and NGOs	Capacity building of communities for preparedness to cryosphere-related hazards
	Local communities and NGOs	Local Communities and NGOs	Establish DRR basket fund
1.3. Strengthened resilience to cryosphere-related risks	Mountain Communities and policymakers	Local Leaders and government	Ensure cryosphere-related risk in infrastructure planning

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Output	Stakeholder	Type	Role in the Project
	Aga Khan Agency for Habitat	Non-Government Organization	Develop protocols and guidelines for effective response to disasters
	Global Change Impacts Studies Centre	Government Agency	Develop policy and SOPs for disaster response
2.1. A comprehensive web-based information management system of springsheds and springs prepared for Malakand and Hazara divisions.	Directorate General of Soil and Water Conservation (DSWC), KP Province	Govt Agency	co-development database and information compilation
	Climate Energy & Water Research Institute (CEWRI)	Govt Agency	co-development database
	Pakistan Council of Research in Water Resources (PCRWR)	Govt Agency	information compilation on water quality indicators
	Pakistan Meteorological Department (PMD)	Govt Agency	information compilation
	Local Communities	local group	information compilation
	Public health engineering department	Govt Agency	information compilation
	Engineering universities /Academia	Academia	Research, Analysis and capacity building
2.2. Recharge measures (for improved springshed practices, land use planning, and bioengineering) co-developed and implemented.	Climate Energy & Water Research Institute (CEWRI)	Govt Agency	Co-development of solution and implementation
	Directorate General of Soil and Water Conservation (DSWC), KP Province	Govt Agency	Co-development and Sustainability
	Provincial Irrigation Department KP Province	Govt Agency	technical inputs and need identification on water use
	Federal Water Management Cell (FWMC), MNFS&R	Govt Agency	technical inputs and need identification on water use
	Public health engineering department	Govt Agency	technical inputs and need identification on water use
	Municipal Committees / Local Communities	Local group	Local Mobilization, Co-development, Sustainability and M&O
	Private sector water companies	Private Sector	Technical inputs
	Private vendors registered under Pakistan engineering council and SECP.	Private Sector	direct execution of the services and works under this component.
2.3. Local governance framework for springshed	Planning and Development Department of KP Province	Govt Agency	Multi-sectoral Coordination

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Output	Stakeholder	Type	Role in the Project
established with enhanced institutional capacity for efficient water resource management.	Pakistan Council of Research in Water Resources (PCRWR)	Govt Agency	Capacity building
	Khyber Pakhtunkhwa Water Regulatory Authority	Govt Agency	Coordination and legislative work.
	Ministry of Water Resources	Govt Agency	Policy and scaling
	Private sector water companies	Private Sector	Policy
	World Bank/ADB/UNDP	Multi-laterals	Scaling of solution
	Municipal Committees / Local Communities	Local group	Local governance and sustainability
3.1. Groundwater mapping and groundwater recharge facilities completed in selected water-scarce locations in the middle basin, including establishing/ strengthening operation, maintenance, and management structures.	Local government and Rural development department	Govt Agency	Project needs and identification.
	Public health engineering department	Govt Agency	Project needs and identification.
	Irrigation department	Govt Agency	Project needs and identification.
	Private sector vendors for engineering services and construction.	Private vendors registered under Pakistan engineering council and SECP.	for direct execution of the services and works under this component.
	local communities	local group	The main beneficiaries of the project and has a leading role on operation and maintenance for long term sustainability.
	Engineering universities /Academia	Academia	Providing technical knowledge on indigenous nature-based solution to mitigate the adverse effect of climate change
3.2. Climate-smart and resilient water supply infrastructure established in selected sites, along with contextually relevant management structures with adequate capacity for operation and maintenance of the community infrastructure.	Local government and Rural development department	Govt Agency	Project needs and identification.
	Public health engineering department	Govt Agency	Project needs and identification.
	PCRWR	Govt Agency	Project needs and identification and detailed feasibility studies
	Civil society Organizations	Registered civil society organization under MoFA	For execution of capacity development services in communities.
	Private sector vendors for engineering services and construction.	Private vendors registered under Pakistan engineering council and SECP.	for direct execution of the services and works under this component.
	local communities	local group	The main beneficiaries of the project and has a leading role on operation and maintenance for long term sustainability.
4.1. Targeted intervention sites identified for evidence-	Local government and Rural development department	Govt Agency	Project needs and identification.

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Output	Stakeholder	Type	Role in the Project
based, climate adaptive and focused WASH interventions.	Public health engineering department	Govt Agency	Project needs and identification.
	Engineering universities /Academia	Academia	Providing technical knowledge on indigenous nature based solution to mitigate the adverse effect of climate change
	PCRWR	Govt Agency	Project needs and identification and detailed feasibility studies
4.2. NbS for sewage treatment demonstrated through constructed wetlands along with proper management structures and adequate capacity for operation and maintenance of wetlands.	Private sector vendors for engineering services and construction.	Private vendors registered under Pakistan engineering council and SECP.	for direct execution of the services and works under this component.
	Local government and Rural development department	Govt Agency	Project Sustainability and O&M.
	Public health engineering department	Govt Agency	Project Sustainability and O&M.
	Engineering universities /Academia	Academia	Providing technical knowledge on indigenous nature based solution to mitigate the adverse effect of climate change and sustainability aspect of the project.
	local communities	local group	The main beneficiaries of the project and has a leading role on operation and maintenance for long term sustainability.
5.1. Government of Sindh supported in systematically prioritizing 15 natural waterways and community water ponds to address water storage and wastage issues.	Local government and Rural development department	Govt Agency	Project needs and identification.
	Public health engineering department	Govt Agency	Project needs and identification.
	Irrigation department	Govt Agency	Project needs and identification.
	PCRWR	Govt Agency	Project needs and identification and detailed feasibility studies
	Private sector vendors for engineering services	Private vendors registered under Pakistan engineering council and SECP.	for direct engineering services for detail designs and BoQs preparations.
5.2. 15 selected waterways/ponds in Sindh Province restored/rehabilitated, including installation of water quality monitoring systems and establishing and strengthening operation, maintenance, and management structures.	Private sector vendors for engineering services and works.	Private vendors registered under Pakistan engineering council and SECP.	for direct execution of the services and works under this component.
	Civil society Organizations	Registered civil society organization under MoFA	For execution of capacity development services in communities.
	Local government and Rural development department	Govt Agency	Project Sustainability and O&M.
	Public health engineering department	Govt Agency	Project Sustainability and O&M.
6.1. National and provincial capacities strengthened to apply innovative social and	Ministry of climate change and Environmental Coordination	Govt Agency	Project needs and identification.

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Output	Stakeholder	Type	Role in the Project
technological tools for establishing and enforcing human-centred and gender-transformative systems of climate change adaptation and accelerating the progress towards management of Indus water resources.	Planning and development department KP	Govt Agency	Coordination and legislative work.
	Planning and development department Sindh	Govt Agency	Coordination and legislative work.
	Local government and Rural development department	Govt Agency	Project needs and identification.
	Public health engineering department	Govt Agency	Project needs and identification.
	Private sector vendors for services.	Private vendors registered under Pakistan engineering council and SECP.	for direct execution of the services under this component.
6.2. National and provincial stakeholders have access to strengthened evidence-based data and knowledge for informed decision-making and implementation of climate adaptation and mitigation that foster collaboration across sectors.	Ministry of climate change and Environmental Coordination	Govt Agency	Project needs and identification.
	District govt	Govt Agency	Capacity development activity and coordination at district level.
	Private sector vendors for services.	Private vendors registered under Pakistan engineering council and SECP.	for direct execution of the services under this component.
	Local government and Rural development department	Govt Agency	Project needs and identification.
	Public health engineering department	Govt Agency	Project needs and identification.
6.3. Youth and women's leadership as well as community-led adaptation solutions strengthened in climate action through awareness-raising and behavioural change campaigns.	Ministry of climate change and Environmental Coordination	Govt Agency	Project needs and identification.
	Youth	Individuals	for capacity development.
	Private sector vendors for services.	Private vendors registered under Pakistan engineering council and SECP.	for direct execution of the services under this component.
	Civil society Organizations	Registered civil society organization under MoFA	For execution of capacity development services in communities.

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Annex 14: Sustainability Interventions

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Project Components / Outcomes	Outputs	Sustainability Interventions
1. Cryosphere Disaster Risk Reduction Outcome 1: Reduced climate-induced cryosphere multi-hazard risk.	1.1: Integrated cryosphere risk mapping through community engagement.	• Train local communities for involvement in cryosphere risk assessment. • Conduct campaigns to inform communities about cryosphere risk. • Establish accessible data platforms for widespread use of integrated cryosphere risk maps.
	1.2: Community-based monitoring and early warning systems established.	• Establish community watch groups for maintenance and ownership of CB-MEWS. • Community-based basket fund complemented by municipal (local government) support. • Conduct regular drills to maintain community proficiency in using early warning systems.
	1.3: Strengthened resilience to cryosphere-related risks.	• Advocate for the inclusion of cryosphere-related risks in local and regional policies. • Support community-led adaptation projects emerging from risk reduction efforts. • Convene regular forums with local governments, NGOs, businesses, and communities to address evolving risks collaboratively.
2. Springshed Revival and Management Outcome 2: Increased access to spring water in climate adaptive and gender-inclusive manner.	2.1: A comprehensive web-based information management system of springsheds and springs prepared for Malakand and Hazara divisions.	• Close collaboration with GIS Unit of the Soil and Water Conservation Department of KPK provincial government for establishing Springs inventory database. • Engagement with relevant universities on hydrogeological, water-climate and water use studies. • Establishment of local communities and municipal bodies-based data collection and monitoring system
	2.2: Recharge measures (for improved springshed practices, land use planning, and bioengineering) co-developed and implemented.	• Co-design recharge solutions based on participatory approach supported by science and evidence collected through Output 2.1 • Promote community-led springs management (e.g., Springs User Groups) and deliver the existing springshed management and monitoring training to community members in the selected communities. • Strengthen local community institutions for operations, maintenance and equitable benefit sharing in a gender-inclusive manner.
	2.3: Local governance framework for springshed established with enhanced institutional capacity for efficient water resource management.	• Establishment of local-level management, and operations rules for springs in collaboration with communities and administration. • Policy level engagement for clarity on roles, responsibilities of various stakeholders involved in the management of springs linked to Component 6. • integrating springs water governance into national water policies and provincial regulations, neglected spring water ecosystems.
3. Groundwater Management and Resilience Community Water Supply Outcome 3: Improved climate-resilient management of	3.1: Groundwater mapping and groundwater recharge facilities completed in selected water-scarce locations in the middle basin, including establishing/ strengthening operation,	• Conduct groundwater mapping at district level. • Undertake feasibility study as part of site identification. • Develop site for recharge as per topographic and geological conditions and ensure selection of sites that are environmentally sustainable. • Installation of water quality meters to support active monitoring.

Project Components / Outcomes	Outputs	Sustainability Interventions
groundwater and community water supply services in vulnerable areas.	maintenance, and management structures.	• Establish and train community-based structures for operation and maintenance of facilities. • Develop training courses for technicians and operators of Local Government Academies with support of academia.
	3.2: Climate-smart and resilient water supply infrastructure established in selected sites, along with contextually relevant management structures with adequate capacity for operation and maintenance of the community infrastructure.	• Identification of vulnerable areas/site selection, including environmental assessment. • Ensure infrastructure is designed in a resilient manner and use of cost-effective technologies (solarisation, lead handpumps, etc.). • Establish and strengthen community water management structures (WASH committees and local technicians). • Link established between community and relevant service providers for technical backstopping and strengthen the supply chain of fast-moving spare parts for the water points.
4. Ecosystem-Based Adaptation Outcome 4: WASH infrastructure in the targeted communities in the Middle Indus Basin is more adaptive to climate change-induced shocks with up scaling of the contextually appropriate NbS.	4.1: Targeted intervention sites identified for evidence based, climate adaptive and focused WASH interventions.	• Site selection—based on the contextual appropriateness where untreated sewage poses a health risk to local populations. • Conduct secondary WASH, environment, and climate change data analysis for target locations. • Undertake site-specific environmental and feasibility assessments.
	4.2: NbS for sewage treatment demonstrated through constructed wetlands along with proper management structures and adequate capacity for operation and maintenance of wetlands.	• Site selection, including an understanding of environmental and communal needs and understanding of EbA requirements. • Installation of wetlands to support reduction in urban effluent and increased water availability. • Strengthen existing government and community structures to operate and maintain the wetland including establishing Public private partnerships for operation and maintenance of the wetlands. • Establish system of tariff collection or community contributions for covering O&M costs. • Provide technical support, innovative and lateral learning platform, and equipment for operation of STPs.
5. Surface Water Conservation Outcome 5: Community and institutional capacity to reduce surface water waste and increase its storage for productive use is increased, allowing communities to adapt to climate-induced shocks.	5.1: Government of Sindh supported in systematically prioritising 15 natural waterways and community water ponds to address water storage and wastage issues.	• Develop local designs based on catchment feasibility studies resulting in improved and more sustainable designs. • Development of detailed designs and BOQs appropriate to the context.
	5.2: 15 selected waterways/ponds in Sindh Province restored/rehabilitated, including installation of water quality monitoring systems and establishing and strengthening	• Restore/rehabilitate selected natural waterways in Sindh as per appropriate environmental assessment. • Install automatic water quality monitoring systems to support real-time monitoring. • Establish pond management committees to promote efficiency. • Establish sustainable community and user contribution system to cover operation and maintenance of the water ponds and water points.

Project Components / Outcomes	Outputs	Sustainability Interventions
	operation, maintenance, and management structures.	• Training and strengthening of local irrigation and water department units at the district level to provide technical support.
6. Adaptive Capacities and empowered communities for strengthened resilience to climate change	6.1: National and provincial capacities strengthened to apply innovative social and technological tools for establishing and enforcing human-centred and gender-transformative systems of climate change adaptation and accelerating the progress towards management of Indus water resources.	All activities under component 6 contribute directly to the sustainability of project activities focused on socio-economic and institutional elements.
	6.2: National and provincial stakeholders have access to strengthened evidence-based data and knowledge for informed decision-making and implementation of climate adaptation and mitigation that foster collaboration across sectors.	
	6.3: Youth and women's leadership as well as community-led adaptation solutions strengthened in climate action through awareness raising and behavioural change campaigns.	

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