



ADAPTATION FUND

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: United Nations Children’s Fund (UNICEF) Pakistan; United Nations Entity for Gender Equality and the Empowerment of Women (UN Women); National Rural Support Programme (NRSP);

Amount of Financing Requested: US\$ 10,000,000 (in U.S 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: 8/10/2023

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

A. Project Background and Context

A.1. General Context

Pakistan, ranked eighth in GermanWatch's Long-Term Climate Risk Index 2021, is one of the world's most climate-impacted countries. Pakistan 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 vulnerability reduction against these shocks. The Indus River is central to this challenge, playing a pivotal role in South Asian economies. 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. With heavy reliance on meltwater recharge, the water-stressed semi-arid basin hosts the globe's most extensive transboundary irrigation system. Pakistan confronts water scarcity in withdrawals and per capita water availability. The Indus River contributes 25% of Pakistan's GDP. It supports nearly 90% of its food production.¹ It draws 45% of its overall flow from snow and ice meltwaters in the Himalayas, Hindu Kush, and Karakorum (HKHK). Rising climate change and anthropogenic black carbon (BC) 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 may stall or be reversed. The 2022 floods in Pakistan underscore the urgency. Intense rainfall flooded the Indus, affecting and estimated 33 million people and causing 1,500 deaths.⁴ After the 2022 flood, a Rapid Need Assessment estimated that 5.4 million people (16% of the 33 million) in 84 affected districts shifted to unsafe drinking water sources. About 1.8 million people have had water services restored in the year since, leaving 3.6 million still without services due to the flood. The assessment revealed inadequate climate-resilient infrastructure, emphasizing the need for climate-resilient and green investments in Pakistan's WASH sector. This, alongside policies, regulatory frameworks, and capacity building, is required for Pakistan to adapt to future climate shocks. Whereas previous water resource management interventions in the Indus Basin focused on structural engineering for the Indus Basin Irrigation System (IBIS).

Pakistani communities, especially women and youth, are becoming more vulnerable to disaster-driven displacement, partly due to 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.⁵ Women in Pakistan continue to lead from positions of power including mitigating climate change impacts not only at the state level but also at 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 growing availability volatility. This moment also 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,⁶ and the Resilient Recovery, Rehabilitation, and Reconstruction Framework (4RF),⁷ 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. **Springshed Revival and 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.

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

⁶ Living Indus. (2023). Living-Indus-Investing-in-Ecological-Restoration-Final-Version. doi:10.1111/j.1467-8330.2008.00709.x.

⁷ UNDP. (2022). Final 4RF. doi: [link](#).

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.

A.2. Cryosphere Disaster Risk Reduction Context

The Indus Basin, covering over 40% of the basin area in 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 (GSs), glacial collapses (GCs) ice/landslide dammed lakes, and abrupt draining of englacial water bodies. These events are putting immense pressure on mountain communities, their infrastructure, and their means of sustenance.

Addressing these challenges require a comprehensive approach that combines mitigation and adaptation efforts. Notably, there is an imperative to recognize 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 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).⁸ Consequently, investments in climate risk management, particularly for GLOF hazards, have been initiated.

The GLOF-I Project (2011-2015), supported by the Adaptation Fund, has been extended to 12 districts in Khyber Pakhtunkhwa (KP) and Gilgit-Baltistan (GB) provinces through the GCF-funded GLOF-II project (2016-2024). While advanced early warning systems are being implemented across these districts, there remains a limited emphasis on community-based risk management and grassroots capacity building, including considerations for gender inclusivity. Involvement of women in leadership roles and inclusive disaster risk management (DRM) practices is indispensable for fortifying community resilience.⁹

According to the 2021 World Bank Pakistan 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. Recognizing 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 National Disaster Risk Reduction (DRR) Policy through the lead of National Disaster Management Authority. This policy document highlights proactive approach for risk assessments, prevention, mitigation and preparedness. Critically, the policy includes focus on capacity development of the vulnerable populations. Provincial level Disaster Management Authorities have also formulated DRR policies and actions plans to support the National DRR policy.

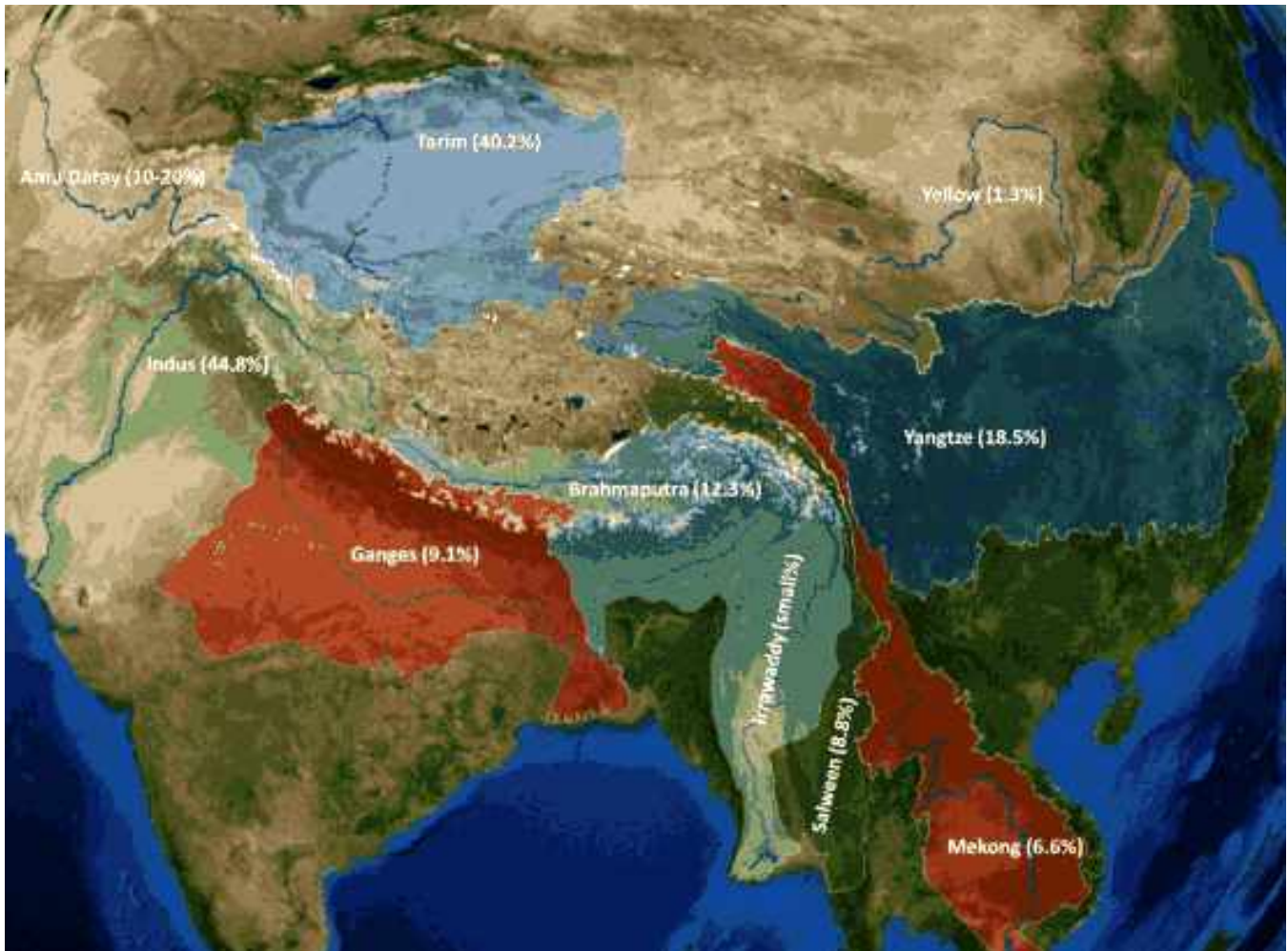
Moreover, adopting a more community centred approach alignment with the UNDP GLOF II initiative presents a significant avenue for integrating a gender equality and social inclusion (GESI) perspective into disaster risk reduction efforts as outlined in the Sendai Framework. The Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW) Committee General Recommendation 37, pertaining to climate change-related risks, 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.

⁸ Ashraf, A., & Rustam, M. (2020). Monitoring Supraglacial lakes Formation and Risk of Outburst Flooding in the Himalayan Cryosphere of Pakistan. *International Journal of Environment*,

⁹ UNDP. (2021). Climate equity: Women as agents of change. Retrieved from [link](#)

This critical intersection of climate change, gender equality, and disaster risk reduction was thoroughly examined in the 2022 ICIMOD study titled “State of gender equality and climate change in South Asia and the Hindu Kush Himalaya”, 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 melts 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 (that dissociate springs from groundwater systems), which create 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, and these systems are not well understood as well, again leading to inappropriate policies and interventions. ICIMOD has developed an integrated community-based methodology and piloted it in Pakistan and Nepal. The learning generated from these experiences has been incorporated into a gender orientation note for springshed revival and management.¹⁰ Nor are the livelihood implications of changes in these springs considered sufficiently in programmatic design, especially considering that they contribute up to 25% of rural and municipal water in the mid-hills of the basin around Malakand, and Hazara. Making them critical aspects of non-surface water, non-pumped groundwater resources that these communities require to meet their water needs. This has led the project design team to prioritize them as areas of intervention for this project. This underlines the need to consider springs more regarding administration and conservation. 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

¹⁰ ICIMOD. (2018). Spring manual 2018. ICIMOD Library. [Link](#).

springs have changed their course or dried up.¹¹ 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 has identified this approach as a priority.¹² Furthermore, it is a crucial adaptive piece in addressing the volatility of glacial meltwater availability. Combined with communal ponds and an effective locally owned springshred revival and management system, it 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, ICIMOD has organized 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 globally. It's the world's leading groundwater exporter, sustaining water-intensive exports like rice, leather, and textiles. Groundwater provides more than 50 % of Punjab's agricultural water requirement, at least 20% for Sindh and 50% for Balochistan. In addition, groundwater serves more than 70% of Pakistan's drinking water requirement.¹³ Despite its role as a climate change buffer, over-extraction, and pollution, driven by poor governance, challenge groundwater. Future sustainability is uncertain; maintaining agriculture use strains other sectors and limits drought resilience. Around 12 billion cubic meters of irrigation water must be reallocated in three decades, with IBIS performance a pivotal factor.¹⁴ Pakistan's drive for sustainable groundwater governance is evident in recent legal and institutional reforms. The 2018 National Water Policy seeks a Groundwater Authority in Islamabad, while the Punjab Water Act (2019) and Khyber Pakhtunkhwa Water Act (2020) empower provincial water resource commissions to license groundwater use. Yet, effective governance implementation lags at both federal and provincial tiers. Groundwater scarcity is rising, notably in Khyber Pakhtunkhwa Province. Population growth, expanding agriculture, and urbanization worsen water scarcity. Pakistan's arid to semi-arid climate covers 796,095 km². 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 groundwater governance for reliable access amid climate change, aiding adaptation efforts.

Remote sensing and land use modelling can effectively quantify water use practices and associated changes.¹⁵ It 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, the resilience of WASH infrastructure tapping from groundwater like design and construction standards, resilience of WASH physical infrastructure, reliability/yield of wells and water quality protection are the significant factors of vulnerabilities of WASH services in flood and other disaster-prone areas. The Post-Disaster Needs Assessment (PDNA) report launched in January 2023 estimates damages worth 575 million US\$ with additional losses of 112 million US\$ 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 are destroyed. More data on community and private infrastructure was needed, an estimated two-thirds of the affected population access these services. The resilient reconstruction needs of the Sector overall have been estimated at 327 million US\$. This estimate considers infrastructure and investment in sustainable operation and maintenance of these systems.

A.5. Ecosystem-based Adaptations (EBAs) Context

EBAs are essential to creating a robust, resilient local approach to 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 well-being and biodiversity benefits. Innovations, particularly in

¹¹ The New Humanitarian (2006), Pakistan: Water a major challenge for earthquake survivors, retrieved 20.02.2023 [link](#)

¹² 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](#)

¹³ National Water Policy of Pakistan, (2018), Government of Pakistan Ministry of Water Resources, retrieved 20.02.2023, [link](#)

¹⁴ World Bank, (2022), Country Climate and Development Report (CCDR) Pakistan, retrieved 26/05/2023, [link](#)

¹⁵ 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

technology and economy, supported by nature 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-utilized, including green infrastructure that can cost-effectively substitute, augment, or work in parallel with grey infrastructure. This potential is even more relevant considering the strain of urbanization in Pakistan; it is above the regional average in terms of its urban population, as per the World Bank Database.

Pakistan treats less than 1% of wastewater in the Indus Basin, falling short of the Sustainable Development Goal (SDG) goal 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.¹⁶ 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 less expensive and more cost-effective treatment solutions that use 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, plantation 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 decentralized manner for small settlements of an average of 200 households.

A.6. Surface Water Conservation Context

Apart from water scarcity, the increased temperatures, varied precipitation, monsoon patterns, and increased emissions have resulted in a greater frequency of extreme weather events, as witnessed in the 2022 devastating impact of flooding 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 Rapid Needs Assessment 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 moved from the use of protected to unprotected drinking water 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 575 million US\$ with additional losses of 112 million US\$ in the WASH sector. The damages include over 4,000 water supply schemes and 2,700 sanitation schemes, managed mainly by the PHED. Data collected indicates that 1,346 plans were destroyed. Insignificant community and private infrastructure data were available, though an estimated two-thirds of the affected population accessed these services. The resilient reconstruction needs of the WASH sector have been estimated at 327 million US\$. This estimate considers infrastructure and investment in sustainable operation and maintenance of these systems.

Therefore, this project, in partnership with UNICEF and NRSP, plans to reconstruct and upgrade some of the community structures in such a manner that not only builds back better but, in the process, also lays the basis for the planning, design and delivery of EBA WASH services in the future. Community rainwater harvesting community ponds that contribute to reducing runoff, improving water quality, and creating additional access to water supply during the dry seasons. 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 of the Context

Women and Children are most vulnerable to the impacts of climate change. As climate changes bring a greater frequency and intensity of drought, floods, heatwaves, air pollution and disease, it is critical to prioritize getting children at the centre of climate mitigation and adaptation efforts.

¹⁶ 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](#)

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 has continued to support the National and Provincial Disaster Management Authorities setting up and managing of Gender and Child Cells to cater the needs of vulnerable populations in climate disasters and climate context.

The gender division of labour in Pakistan is highly skewed, especially when agricultural, pastoral, and wage labour are combined with household, community, and casual labour. With high rates of male out-migration 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. Thus, marginalizing women's work contributions relative to men renders them more vulnerable vis-a-vis men. Therefore, climate change risks and vulnerability have a fundamental gender dimension.¹⁷ 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.¹⁸

As climate disasters affect livelihoods, working men migrate, exposing women and children to persistent climate-caused natural disaster risks. Urbanization, a form of internal migration, follows this trend. Climate change also challenges children's rights under the CRC, which Pakistan signed. Women and children bear water burdens, so gender-inclusive adaptation is crucial for widespread impact. The gender dimension in developing local DRR mechanisms is a critical consideration. The need for a GESI approach to DRR is outlined in the Sendai Framework.

The Sendai Framework highlights four priorities. The CEDAW Committee General Recommendation 37 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 good 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 2022 adopted 4RF also prioritizes addressing social vulnerabilities in the context of climate change towards resilient societies and acknowledges that participatory, inclusive and participatory approach to resilience building is necessity.

A.8. Institutional Response Context

In July 2023, Pakistan launched its inaugural NAP, a significant step toward climate resilience. It emphasizes five core priorities, with the first being the agriculture-water link. Strategies here focus on climate-smart farming, modernizing 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. The project aims to implement NAP elements and support Pakistan's government in its implementation.

Another milestone was 2022 adopted ccGAP that integrates gender and climate in key sectors of economy, particularly agriculture and good security, water and sanitation, DRR, forest and biodiversity, coastal management, energy transportation. The ccGAP builds on broad consultations and assessment done in support of International Union of Conservation of Nature (IUCN) Pakistan and funded by Gender Readiness Grant from the Green Climate Fund. And it also benefitted from the extensive study on women's role in climate change in Pakistan, 'Climate Equity: Women as Agents of Change' (2022) done by National Commission on 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

¹⁷ Gurung Goodrich, Chanda (2017) Status of Gender, Vulnerabilities and Adaptation to Climate Change in the Hindu Kush Himalaya, ICIMOD

¹⁸ D'Cunha, J. (1997). Engendering disaster preparedness and management. Asian Disaster Management News

climate resilience in Pakistan. Further, UN Women supported National Commission on the Status of Women in the launch of the National Gender Data Portal (NGDP) of Pakistan in 2023 that collect, collate, integrate and disseminate information on gender related indicators using dynamics tools to inform policy makers and leaders, also in climate related indicators.

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, Pakistan can showcase effective models to meet this aim. The government prioritizes promoting EBAs to protect, sustainably manage, and restore ecosystems, addressing societal challenges while benefiting people and nature. UNICEF, a key partner in the 'One UN' program, collaborates with Pakistan's government for water and climate initiatives. The Ministry of Climate Change & Environmental Coordination (MoCC&EC) is UNICEF's federal counterpart.

Pakistan is a founding regional member country of ICIMOD. The incumbent Secretary of the Ministry of National Food Security and Research formally represents Pakistan in the ICIMOD Board of Governors. 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 of 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 abstraction 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 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 (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 for capacity development and knowledge management (KM). UNICEF's ongoing study aims to bridge institutional gaps in water and climate sectors, supporting the government over 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 4 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 recognized 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.¹⁹
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.²⁰
3. **4RF:** A PDNA, undertaken by the Government of Pakistan, indicated that recovery estimates of over US\$ 16 billion would be required from 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 gender lense and provides an overarching framework for planning, financing, implementing, and monitoring Pakistan's resilient recovery, rehabilitation, and reconstruction efforts.²¹

A.9. The Transboundary Basin Context

The 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. Of all the parties with a stake in the basin, the most critical challenge to consider is the Indus Water Treaty (IWT). Currently, the IWT faces uncertainties and challenges, with limited prospects for change. The treaty, signed in 1960 between India and Pakistan, has prevented

¹⁹ Living Indus, retrieved 20.02.2023, [link](#)

²⁰ Clean Green Pakistan, retrieved 27.02.2023, [link](#)

²¹ Pakistan Floods 2022: Resilient Recovery, Rehabilitation, and Reconstruction Framework (4RF), retrieved 18.02.2023, [link](#)

major conflicts over the river. Pakistan, heavily dependent on the Indus River, is among the most water-stressed nations. Combined with the gender dimension of outmigration prevalent in Pakistan, this will also negatively impact women, who tend to have less access to migration as an adaptation strategy. This is both the case for internal and international migration.²² 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 expected 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.

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.

Opportunities exist amid these circumstances. Transboundary scientific exchange continues, facilitated by ICIMOD, which leads the Upper Indus Basin Network (UIBN) secretariat. UIBN, voluntary and informal knowledge and research network, 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.

B. Project Objectives

To meet the above-outlined challenges, the Proposed Project seeks to achieve the following objective:

To **reduce the vulnerability and increase the adaptive capacity** of the population residing in Pakistan's Indus Basin to respond to the impacts of climate change through improved CB-MEWS, enhanced community and institutional capacity, resilient land use planning, and improved policy guidelines.

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 to mitigate and reverse groundwater depletion due to climate-induced trends, increasing local resilience and climate adaptive capacity and establish/upgrade climate resilient water

²² International Labour Organization (ILO), Female Labour Migration from Pakistan: A Gender Perspective, Publication: Geneva: ILO, 2019.

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 Solutions:** Community and institutional capacity to transform an ecological liability into a climate adaptive asset is increased, by cleaning and using wastewater, reducing reliance on pumped water, and rendering communities more adaptive.

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.
 - 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:** Institutional capacity strengthened to reduce risks associated with climate-induced socioeconomic and environmental losses at national, provincial, and district levels. The adaption solutions and strategies applied through the project and the risks they address are communicated to the population of the Indus Basin in Pakistan, and the knowledge generated on their contextual appropriateness and up-scaling potential are documented, increasing the sectoral knowledge base, and driving uptake beyond the project. 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.
- 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

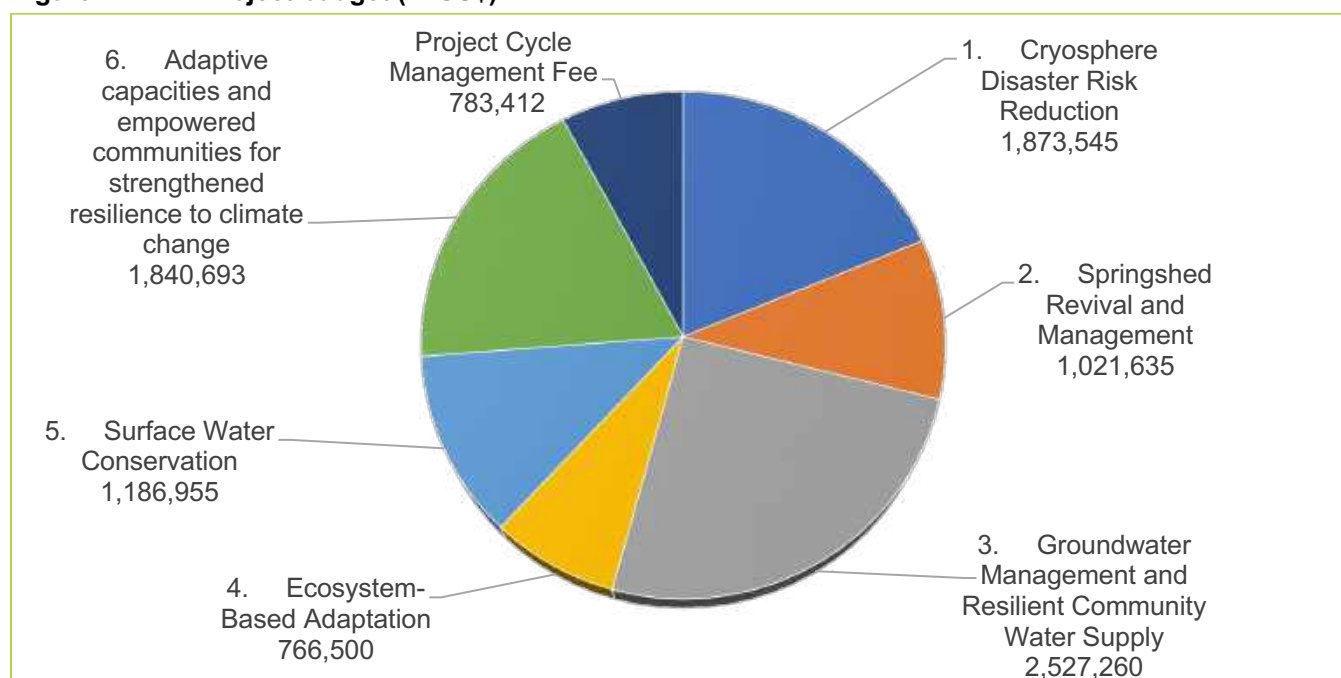
Each component is subdivided into two to three distinct output categories:

- **Knowledge gap filling, or ground-truthing** ensures contextual appropriateness of the individual adaptive measure and includes communities in deploying the solutions and their sustainability.
- **Community-level interventions** that increase the adaptive capacity of members of the communities, with a view to a gender-inclusive approach.
- **Institutional changes** or advocacy thereof, codeveloped with the local authorities that consolidate and enable scale-up of the adaptive outcomes 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 and budgeted through a comprehensive environmental and social safeguard compliance analysis and consultations (Section L). Resultantly, a Theory of Change, a comprehensive Environmental and Social Management Plan and a gender-inclusive Grievance Redressal Mechanism (GRM) have also been formulated annexed as Annex 1, Annex 3 and Annex 4, respectively.

The project is estimated to cost US\$ 10,000,000, which includes US\$ 9,216,588 as the direct cost. The component-wise budget allocation is shown in Figure 2 and the detailed budget is given at Section V.

Figure 2: Project budget (in US\$)



D. Projected Calendar

Milestones	Expected Dates
Start of Project Implementation	1 May 2024
Mid-term Review (if planned)	31 January 2026
Project Closing	31 October 2027
Terminal Evaluation	31 December 2027

PART II: PROJECT JUSTIFICATION

E. Project Structure

The proposed project addresses six distinct impacts of climate change and the risks arising from them that 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 capacity, knowledge and coordination as well as exclusion of youth and women from development plans and community initiatives that affect Indus River Basin. To address these climate-related threats to the population of Pakistan's Indus Valley, the project mobilizes the expertise of four 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 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.
4. **National Rural Support Programme (NRSP):** Is a not-for-profit Pakistani organization and the most extensive Rural Support Programme in the country for outreach, staff, and development activities. NRSP's mandate is to alleviate poverty by harnessing people's potential and undertaking development activities in Pakistan. It has a presence in 72 Districts across Pakistan.

Bringing together the combined expertise and field-level capacity of these partners, six distinct adaptation measure components will be deployed to empower local communities and policymakers at the provincial and national levels to adapt to the above-outlined climate change challenges:

1. CB-MEWS and site planning to reduce the loss of life and property due to cryosphere hazards in the Upper Basin.
2. 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. 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. 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. 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. 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 mobilization for sustainable climate action.

By rooting the proposed 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. Therefore, reducing the costs of projects/programmes to implement climate-resilient measures in the future.

The **Theory of Change** for the 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 Pakistan's Indus Basin will be able to reduce their climate vulnerability with increased adaptive capacity **BECAUSE** they will have 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 at Annex 2.

E.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 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 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 utilizing 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.

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 community members' monitoring.

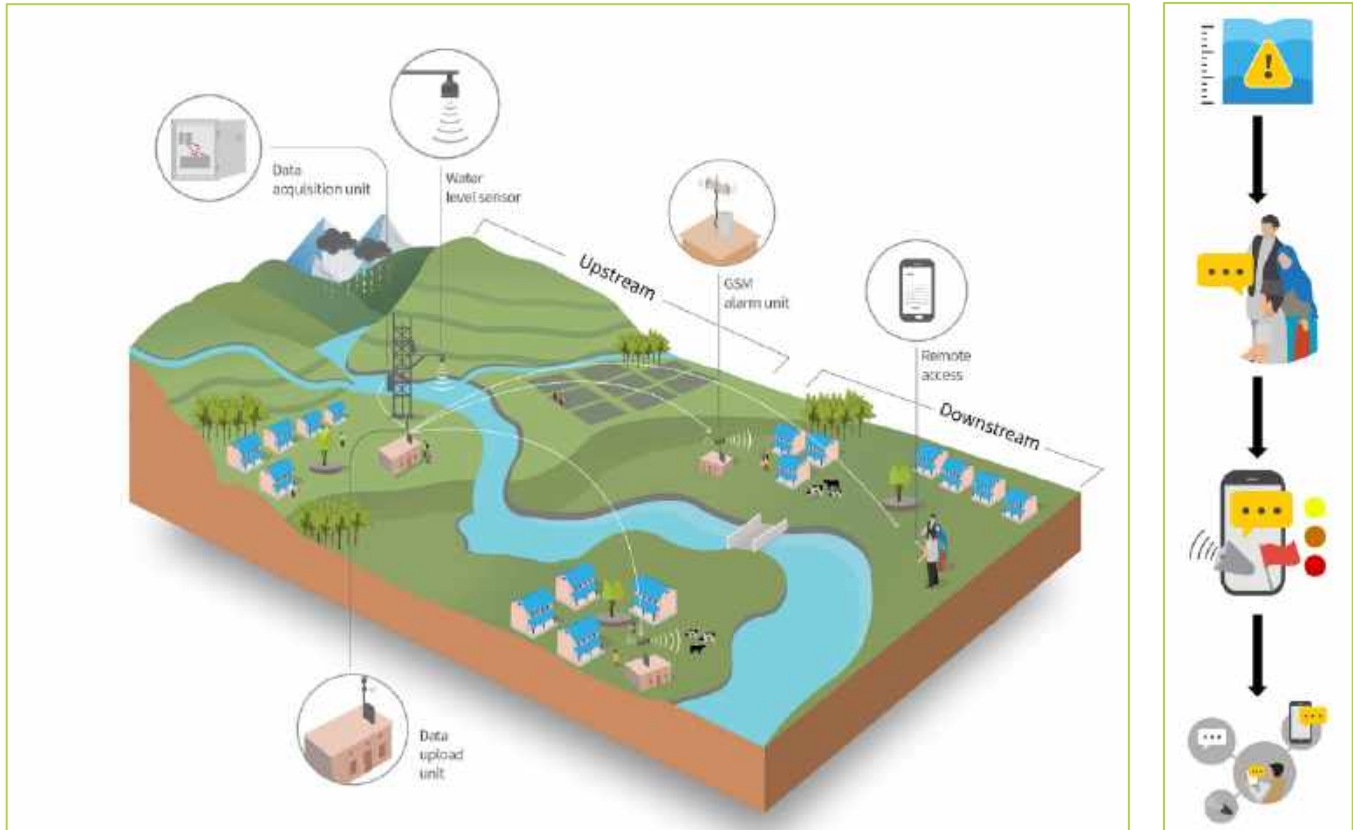
A participatory approach involves actively involving community members in the monitoring process. This means that the community itself contributes to the identification of hazards, the selection of monitoring methods, and the decision-making process. The plan also includes the use of appropriate technology to 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-MEWS²³ based on Output 1.1 for hazards such as permafrost-triggered GLOF, glacial floods, landslides, rainfall-induced floods, and avalanches.

Recognizing that different genders may have unique vulnerabilities and needs during hazardous events such as permafrost-triggered GLOF, glacial floods, landslides, rainfall-induced floods, and avalanches. The CB-MEWS (Figure 3) 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 well-being of women, children, and other vulnerable groups during emergencies.

Figure 3: 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 items through the support of local disaster management authorities, and systematic data collection. This ensures that the evacuation process is well-organized and prioritizes the well-being of all individuals.

²³ 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.

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 localized 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 Community Based Disaster Risk Management committees - 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 Community-Based Disaster Risk Management (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 disaster risk reduction efforts.

This includes establishing Disaster Risk Reduction (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 standardized and coordinated response in place, which can significantly improve the community's ability to manage and recover from disasters.

Site Selection Criteria²⁴

²⁴ (1) GLOFs Data: [link](#); (2) Glacial Lake Inventory: [link](#); (3) Permafrost Probability: [link](#); (4) Population Data of Pakistan: [link](#); (5) Infrastructure location: [link](#); (6) National Boundary of Pakistan: [link](#); (7) Basin Boundaries: Extracted using Shuttle Radar Topographic Mission (SRTM) Digital Elevation Model (DEM) downloaded from [link](#)

- 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 were used, 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 of more than 200 thousand square meters area with a history of past damages 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 and 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: Downstream communities and infrastructure from potentially dangerous glacier lakes are 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 disaster risk reduction efforts.
- Multi-hazard Approach: Assessing 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.

Sites that will be targeted under this Component based on the consultative process are:

Provinces	Divisions	District	Tehsil or Community
Gilgit-Baltistan	Gilgit-Baltistan	Ghizer	Ishkoman Valley, Manjawa Valley and Sher Qilla Valley
Gilgit-Baltistan	Gilgit-Baltistan	Hunza	Hassan Abdal Valley and Shimshal Valley
Gilgit-Baltistan	Gilgit-Baltistan	Gilgit	Bagrot Valley
Khyber Pakhtunkhwa	Chitral	Chitral Upper	Reshun Valley and Susoom Valley
Khyber Pakhtunkhwa	Malakand	Chitral Lower	Kalash Valley

E.2. Component 2 – Springshed Revival and Management (Led by ICIMOD)

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 spring-sheds 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 springs' water patterns and associated practices within the context of climate and environmental shifts in the KP province (Figure 4). 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 marginalized groups, ensuring a holistic understanding for effective revitalization strategies.

Figure 4: Schematic diagram of a springshed



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.

Output 2.2: Recharge measures (for improved spring-shed 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.

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. A set of suitable nature-based solutions in the local context will not only enhance the quantity and stability of spring discharge but also improve its water quality.

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.

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 fosters inclusive and transparent governance, empowering communities to actively participate in water-related decisions.

Output 2.3: Local governance framework for spring-shed 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 project's innovation 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, organizations, and other communities interested in implementing similar interventions. It will also help refining 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 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.

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 that will be targeted under this Component based on the consultative process are:

Provinces	Divisions	District	Tehsil or Community
Khyber Pakhtunkhwa	Malakand	Swat	Babuzai
Khyber Pakhtunkhwa	Hazara	Abbottabad	Nathia Gali
Khyber Pakhtunkhwa	Hazara	Mansehra	Shinkiari
Khyber Pakhtunkhwa	Malakand	Lower Dir	Adenzai

E.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.

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 6 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.
- Activity 3.1.4. Install water quality meters will 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 (LGAs), 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 benefiting 150,000 people in Mirpurkhas, Umerkot, Sujawal, Badin, Khairpur and Sukkur districts of Sindh and Charsada, Swat and Nowshera districts of KP province.
- Activity 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.
- Activity 3.2.4. Establish/strengthen community water management structures, including training WASH committees and local technicians.

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 that will be targeted under this Component based on the consultative process are:

Provinces	Divisions	District	Tehsil or Community
Khyber Pakhtunkhwa	Malakand	Swat	VC Qambar
Khyber Pakhtunkhwa	Malakand	Swat	VC Tindodag
Khyber Pakhtunkhwa	Malakand	Swat	VC Islampur
Khyber Pakhtunkhwa	Malakand	Swat	NC Khawja Abad
Khyber Pakhtunkhwa	Malakand	Swat	NC Sharif Abad
Khyber Pakhtunkhwa	Malakand	Swat	NC Landikas
Khyber Pakhtunkhwa	Peshawar	Charsadda	Charsadda
Khyber Pakhtunkhwa	Peshawar	Nowshera	Nowshera
Khyber Pakhtunkhwa	Malakand	Swat	Bahrain
Sindh	Sukkur	Sukkur	Bachal Shah
Sindh	Sukkur	Sukkur	Kandhra
Sindh	Sukkur	Khairpur	Kot Deji
Sindh	Sukkur	Khairpur	Sobho Dero
Sindh	Sukkur	Khairpur	Kambat
Sindh	Mirpur Khas	Mirpur Khas	Degree
Sindh	Mirpur Khas	Mirpur Khas	Kot Ghulam Muhammad
Sindh	Mirpur Khas	Mirpur Khas	Sindhri
Sindh	Mirpur Khas	Mirpur Khas	Hussain Bux Mari
Sindh	Mirpur Khas	Mirpur Khas	Shujabad

Provinces	Divisions	District	Tehsil or Community
Sindh	Mirpur Khas	Umerkot	Samaro
Sindh	Mirpur Khas	Umerkot	Umer Kot
Sindh	Mirpur Khas	Tharparkar	Diplo
Sindh	Hyderabad	Sujawal	Jati
Sindh	Hyderabad	Sujawal	Mirpur Bathoro

E.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 up scaling of the contextually appropriate NbS solutions.

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.

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 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).

Site Selection Criteria

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

Sites that will be targeted under this Component based on the consultative process are:

Provinces	Divisions	District	Tehsil or Community
Khyber Pakhtunkhwa	Peshawar	Charsadda	Shabqadar
Khyber Pakhtunkhwa	Malakand	Swat	Madian
Khyber Pakhtunkhwa	Peshawar	Nowshera	Nowshera
Sindh	Sukkur	Sukkur	Bachal Shah
Sindh	Sukkur	Sukkur	Kandhra
Sindh	Sukkur	Khairpur	Sobho Dero

E.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 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.

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 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.

Site Selection Criteria

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

Sites that will be targeted under this Component based on the consultative process are:

Provinces	Divisions	District	Tehsil or Community
Sindh	Bhanbore (Thatta division)	Sujawal	Jati
Sindh	Bhanbore (Thatta Division)	Sujawal	Mirpur Bathoro
Sindh	Bhanbore (Thatta Division)	Sujawal	Shah Bandar
Sindh	Mirpur Khas	Umerkot	Samaro
Sindh	Mirpur Khas	Umerkot	Umer Kot
Sindh	Mirpur Khas	Tharparkar	Chachro
Sindh	Mirpur Khas	Tharparkar	Diplo
Sindh	Mirpur Khas	Tharparkar	Islamkot
Sindh	Mirpur Khas	Tharparkar	Mithi
Sindh	Mirpur Khas	Sanghar	Sinjoro

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

The scope of Component 6 is primarily a “whole of basin” but secondarily 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 management of Indus water resources.

- Activity 6.1.1. Conduct gap analysis of groundwater legislation at the provincial and federal levels and recommend and support implementing tangible actions for drafting new groundwater acts in KP and Sindh provinces.
 - 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 stakeholders in Sindh and KP provinces, especially the government departments from different provincial/area governments, through KM products.
 - Activity 6.1.8. Facilitate improved knowledge and practices of policy makers on WASH and climate change.
- Output 6.2: An extensive knowledge repository on climate change and WASH practices developed.**
- Activity 6.2.1. Integrate the CGPCP data into the Living Indus Knowledge Platform: Crowdsourcing Knowledge Platform.
 - Activity 6.2.2. Organise a workshop to validate the indicators for contextual appropriateness, focusing on Sindh, KP and GB.
 - Activity 6.2.3. Undertake district-level training sessions in 15 districts of the proposed programme in Sindh, KP and GB provinces to train the district government staff in data collection and data entry in CGPI web portals.
 - Activity 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 programme, i.e., Water, Sanitation, Hygiene, Liquid and Solid Waste Management and Plantation.
 - Activity 6.2.5. Provide technical support to the MoCC&EC to review the climate adaptation data against indicators being reported by districts.
 - Activity 6.2.7. Support the initial production of three six-month database analyses and dissemination to decision-makers and stakeholders at the national and provincial levels as part of the Living Indus Initiative monitoring mechanism.
 - Activity 6.2.8. Create a comprehensive database of all climate adaptive NbS and EbAs technologies used in the Indus Basin, their cost, efficacy, and contextual prerequisites.
 - Activity 6.2.9. Development of National Indus Water Atlas web portal with GIS modelling and geotagging.
 - Activity 6.2.10. 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 6.2.11. Support production and dissemination of KM products, including One Catalogue of appropriate technologies and NbS for different Indus River basin geographical zones, four technical papers on specific activities of the programme for replication elsewhere, One Catalogue of water sector stakeholders from the private sector, academia and research organisations, development, and

donors, CSOs and CBOs, and government/semi-government organisations with geographical presence and capacities for partnership in the Indus basin and six success stories/case studies.

Output 6.3: Community-led adaptation solutions widely adopted through awareness-raising and behavioural change.

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

F. Economic, Social and Environmental Benefits

UN Women supports the Government of Pakistan in realizing its 4RF vision and particularly supporting the implementation of the Strategic Recovery objective 3 of the same that focuss on social inclusion in building climate resilience. In 2023 UN Women has been consolidating locally informed evidence on gender and climate security linkages in flood-affected provinces in Gilgit-Baltistan and Sindh. These results, which will be forthcoming in the fourth quarter of 2023, will inform the final gender assessment and action plan of the programme. The series of consultations have collected evidence on a) the connections between women's lived experiences of climate change and human security; and 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 usefully 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 as well. 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 fundamentally apply to any project, 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 prioritized in screening the technical outputs and the selected project sites. The screening of ESP compliance has been integral to all levels of the 4 phased consultation process (Section L), this has resulted in an E&S risk assessment per component and the risks have been identified across the 15 ESP principles. These have fed into the Environmental & Social Impact Assessment (ESIA). This 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 L) that are designed to provide a space for

women, youths and socially marginalized groups to guide the design of the ESIA and GRM, as well as integrate them in project governance at the local level.

Table 1: Economic, social, and environmental benefits by component

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.	<p>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.</p> <p>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.</p>
	Springs- In the Middle Basin, rural and municipal water supplies relying on springs are increasingly strained, resulting in a loss of income opportunities.	<p>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.</p> <p>Policymakers at the local level are more able to plan resilient income creation investments and mitigate the impact of water scarcity on the health and well-being.</p>
	<p>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.</p> <p>Water supply services for communities in middle and lower basin damaged by recurrent flooding which led to economic losses for reconstruction and rebuilding</p>	<p>Communities are empowered to adapt their practices in terms of groundwater management to increase water availability for economic purposes, reducing the volatility of income opportunities due to water scarcity.</p> <p>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 services improve water security, the health conditions and reduce HH medical costs.</p> <p>Improved building local knowledge and skills and create livelihood for community members.</p>
	EBAs – In the Middle and Lower Basin, increasingly toxic urban effluent is endangering communities and ecosystems, increasing health expenditures	<p>Communities are empowered to adapt their practices in terms of wastewater treatment through EBAs to increase water availability for economic purposes and reduce health expenditure by households incurred for medical treatment through reducing pollution.</p> <p>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.</p> <p>By engaging communities for construction activities, the project will contribute for building local knowledge and skills and create livelihood for community members. Policymakers at the local level are more able to plan resilient and inclusive water-dependent income creation investments.</p>

Type of Benefit	Baseline	With/after Project
	<p>Surface Water Conservation-In the Lower Basin, surface water scarcity is leading to use of saline and brackish ground water by most communities and increased cost of water treatment, loss of income and increased health costs</p>	<p>Communities are empowered to adapt surface water conservation practices to increase freshwater availability and improve ground water quality through increased recharge. This will reduce cost of water treatment as surface water need simple filtration while saline ground water needs expensive treatment options like reverse osmosis systems.</p> <p>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.</p>
	<p>Adaptive capacities and empowered communities – Lack of proper spring shed management, groundwater management and reduction of cryosphere risks regulations and strategies led to unregulated extraction of ground water, 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.</p> <p>Limited coordination capacity 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.</p> <p>No proper KM platform to document local and indigenous community adaptation practices, introducing new practices from experiences of other countries and to increase investment on scaling up of community-based adaptation.</p> <p>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</p>	<p>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.</p> <p>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.</p> <p>Targeted KM products and platforms for experience sharing, advocacy and programme 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.</p> <p>Enhanced knowledge and awareness on impact of climate change, climate security, 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.</p>
Social	<p>Cryosphere- In the Upper Basin, the retreating glaciers and the associated</p>	<p>Communities exposed to cryosphere risk will be more able to adapt and respond to them, increasing resilience and</p>

Type of Benefit	Baseline	With/after Project
	<p>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 accessibility and reduced access to productive energy in the upstream communities, further increasing rural flight pressures.</p>	<p>increasing the likelihood of the communities remaining in their areas of origin.</p> <p>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.</p>
	<p>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.</p>	<p>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.</p> <p>Local leaders can use policy incentives and community engagement to replicate the results in other communities.</p>
	<p>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 resentment by some segments of the society not served because of unregulated use by others.</p> <p>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</p>	<p>Communities are more able to use groundwater in a more sustainable manner while ensuring that the recharge of the groundwater levels is maximized 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.</p> <p>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</p>
	<p>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</p>	<p>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.</p> <p>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.</p>

Type of Benefit	Baseline	With/after Project
	<p>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.</p>	<p>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.</p> <p>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.</p>
	<p>Adaptive capacities and empowered communities – Limited technical knowledge and awareness on impact of climate change at communities and households combined with limited regulatory frameworks and poor enforcement capacity at all levels created irresponsible and unequitable use of existing water resources mainly ground water 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 marginalized which created conflict and resentment</p>	<p>With enhanced awareness, KM platforms and project supported regulatory frameworks and improved capacities equitable water use will be improved, communities better prepared for future climate induced 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.</p> <p>Local leaders and community platforms have access to evidence on risk of the cryosphere, existing hydrogeological situation of springs and ground water, 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</p>
Environmental	<p>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.</p>	<p>Communities use improved site and land planning practices to avoid the negative environmental impacts of unsustainable and non-resilient construction practices.</p> <p>Policymakers benefit from an improved evidence base that informs environmental risk assessments and asset depreciation calculations regarding downstream infrastructure investment.</p>
	<p>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.</p>	<p>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.</p> <p>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 adaption strategy and Living Indus Initiative.</p>

Type of Benefit	Baseline	With/after Project
	<p>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.</p> <p>Most of existing water supply infrastructure not designed and constructed based on the aquifer recharge capacity which affects the ground water 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 CO₂ emissions.</p>	<p>The project will construct nature-based ground water recharge facilities in the locations identified for water scarcity and depletion of ground water which will have a positive environmental contribution by balancing the ground water recharge and extraction and protecting aquifers from damages due to over extraction and improving ecosystem resilience.</p> <p>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 ground water 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.</p>
	<p>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.</p>	<p>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.</p>
	<p>Surface Water Conservation- Saline and brackish ground water 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 ground water due to low recharge and increasing sea water intrusion.</p>	<p>The community ponds will support communities to have access to alternative fresh water sources and increase ground water recharge and reduce ground water salinity. The rehabilitated waterways will also reduce flush flooding and improve the overall ecosystem at local level.</p>
	<p>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.</p>	<p>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.</p>

The Fund's ESP and GP underline the importance of ensuring the inclusion of marginalized and vulnerable groups in consultative and decision-making processes. Furthermore, most 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 ICIMOD in planning and monitoring

the project implementation through the environmentally and socially responsible executing entities (UNICEF, UN Women and NRSP) in an environmentally and socially safeguarded manner.

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

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, maximizing 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 across the 15 ESP principles, prioritizing 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 province
 - Focus group discussions with community members. These consultations were held in various regions, including: (i) Kailash Valley Birir, Chitral, Khyber Pakhtunkhwa, (ii) Bagrote Valley, Gilgit-Baltistan, and (iii) Malakand and Hazara Division, Khyber Pakhtunkhwa. (iii) Project site in the Sindh province
 - 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.

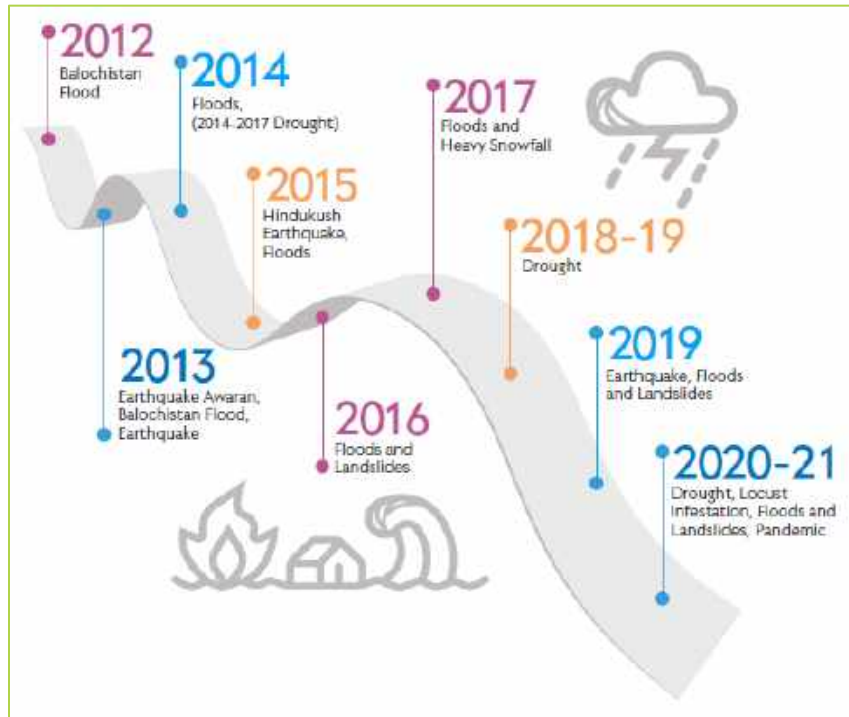
F.1. Vulnerability Analysis

Figure 5 shows, multiple natural disasters were recorded in Pakistan, among which floods hit almost every year.²⁵ Most vulnerable population to floods are living in the Indus River Basin. Map 1 illustrates major areas where

²⁵ Government of Pakistan. 2021. *Climate Risk Assessment for WASH Sector in Pakistan*. Islamabad: Ministry of Climate Change.

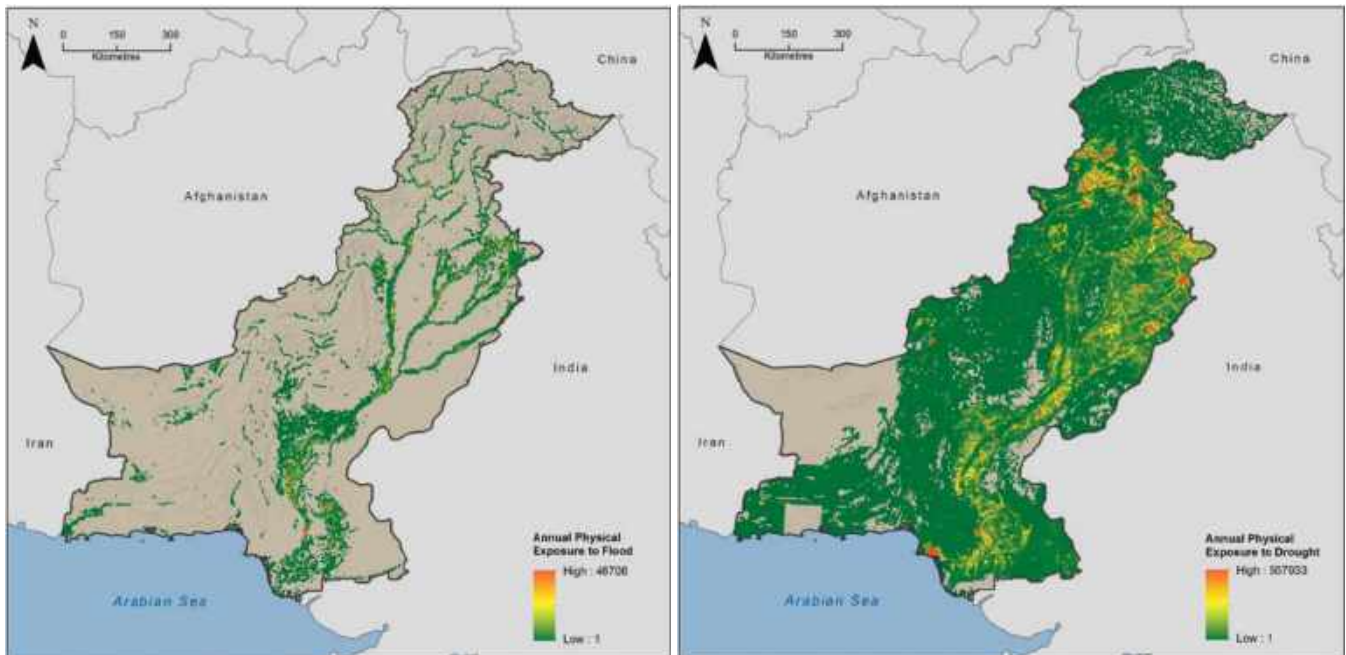
populations are vulnerable to seasonal floods mostly in KP, Punjab and Sindh Provinces, and drought.²⁶ Targeted districts are part of these flood- and drought prone areas, where population is vulnerable to climate induced disaster risks which poses socio-economic, financial, and environmental impacts.

Figure 5: Natural disasters in Pakistan



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

Map 1: 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*.

²⁶ 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).

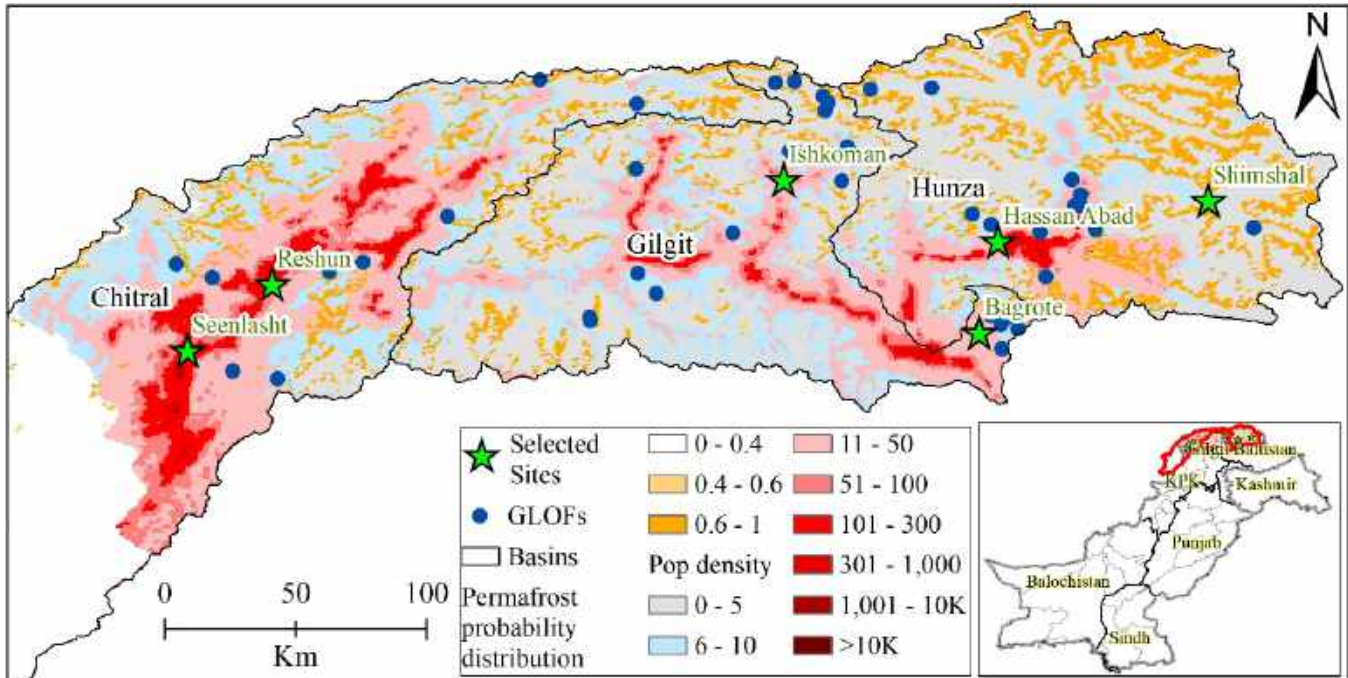
Map 2: SAFER-Pakistan project districts in Sindh, KP and GB



F.1.1. Gilgit-Baltistan Province

A comprehensive vulnerability assessment focused on cryosphere hazards, particularly Glacial Lake Outburst Floods (GLOFs), in northern Pakistan, encompassing the Gilgit-Baltistan (GB) region, was conducted based on specific selection criteria. The assessment prioritizes areas with the existence of potentially dangerous glacier lakes (PDGLs), as identified in the GLOFs database, emphasizing lakes with a size over 200k square meters and a history of past damages. The Upper Indus Basin (UIB) in the Hindu Kush Himalaya (HKH) region, characterized 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, recognizing the socio-economic, financial, and environmental impacts of cryosphere-related disasters in the region. Map 3 shows the selected sites based on the vulnerability assessment.

Map 3: Vulnerability to cryosphere hazards in Gilgit-Baltistan and potential study sites



In the Gilgit-Baltistan province, specific valleys such as Ishkoman, Manjawa, Sher Qilla, Hassan Abdal, Shimshal, Bagrot, stands out as particularly prone to cryosphere hazards, including Glacial Lake Outburst Floods (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, emphasizing the urgent need for strategic planning and adaptive measures. This recognition underscores the significance of addressing the socio-economic and environmental impacts associated with cryosphere-related risks in these provinces, with a specific focus on the mentioned valleys. The details of beneficiaries are given in Table 2 and the summary of climate hazards and underlying vulnerabilities in the target areas in Table 3.

Table 2: Beneficiaries in Gilgit-Baltistan

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

Table 3: Summary of climate hazards and underlying vulnerabilities in the target areas

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 adaptation plans to enhance resilience and preparedness.

Climate Change Hazard	Impact on Community	Underlying Vulnerability / Barriers to Adaptation	Target Community Affected	Activity Proposed
				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, characterized 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. 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.
	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 to create disaster response recommendations. Advocate for standardized implementation. Coordinate with Disaster Agencies for CB-MEWS integration and up-scaling for broader preparedness.

F.1.2. KP Province

According to the findings from the climate risk assessment (MOCC, 2021),²⁷ 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 (Map 2).

²⁷ Government of Pakistan. 2021. *Climate Risk Assessment for WASH Sector in Pakistan*. Islamabad: Ministry of Climate Change.

Table 4: 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 potentially treated differently.		
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		

Table 5: 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 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 Construction of solar-powered water supply facilities Establishment of community water management structure with training for WASH committees
Cryosphere hazards including GLOFs	Potential GLOFs, leading to downstream flooding, infrastructure	high-risk zones due to the proximity of glacier lakes, inadequate infrastructure	Chitral District Reshun Valley (Upper Chitral) Kalash Valley (Lower Chitral)	Community-based Comprehensive mapping and monitoring of glacier lakes in the identified valleys.

Climate Change Hazards	Impact on Community	Underlying Vulnerability / Barriers to Adaptation	Target Community Affected	Activity Proposed
	damage, and community displacement.	resilience, and limited early warning systems.		Installation of early warning systems to alert communities in the event of potential GLOFs. Development of community-based 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	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

F.1.3. 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.

Table 6: 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

Name of District	Khairpur	Mirpur Khas	Sanghar	Sujawal	Sukkur	Tharparkar	Umerkot
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	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	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, Mirpurkhas where socio-economic conditions is quite vulnerable as those community members are casual laborers. 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. In Khaipur, majority of the population is agricultural laborers who are socio-economically vulnerable. Sanghar has 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 community members, child labour has also increased due to climate impact including floods and low productivity of agriculture.						

Table 7: 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	<p>Damages on water supply facilities</p> <p>Pollution of wells</p> <p>Public health risks due to lack of access to safe drinking water</p> <p>GBV risks for girls and women due to locations and distance to water point</p>	<p>Excessive dependency on fossil-fuelled generator</p> <p>Excessive operation and maintenance cost</p> <p>Lack of knowledge and skills</p> <p>Long time to fetch water</p>	<p>Khaipur District, Sindh Bhelaro Deh Sohu Fatehpur Gambat Town Kot Diji Town Rasoolabad</p> <p>Mirpurkhas District, Sindh Chetori Hussain Bux Mari Hangoro Ismail Khumbhar Jhurbi Kangoro Khumbri Makhan Samon Meer Fateh Khan Mir Ali Bux Talpur Mir Khuda bux OLD Mirpur</p>	<p>Output 3.2. Assessment of flood-affected vulnerable districts</p> <p>Construction of solar-powered water supply facilities</p> <p>Construction of climate-resilient handpumps</p> <p>Establishment of community water management structure with training for WASH committees</p>

Climate Change Hazards	Impact on Community	Underlying Vulnerability / Barriers to Adaptation	Target Community Affected	Activity Proposed
			<p>Sarhal Tajo Khaskheli</p> <p>Sujawal District, Sindh Akbar Shah Jhok Shareef Kandhor Koti Mirpur Bathoro Shah Mohammad Shah</p> <p>Sukkur District, Sindh Saeedabad Wah Burira</p> <p>Umerkot District, Sindh Debho Faqeer Abdullah Gulzar e khalil Khan Sb Atta Mohd Palli Kharoro Sayed Mir Walli Mohd Talpur Sabho Samro Road Satryion Walli Dad</p>	
	<p>Water body contamination</p> <p>Public health risks due to overflow of untreated wastewater</p>	<p>Non-existence of sewage and wastewater treatment system</p>	<p>Khaipur District, Sindh Dhonbut pur Mirak Pir Hayat Shah Sagyoon</p> <p>Sukkur District, Sindh Wah Burira</p>	<p>Output 4.1. Secondary WASH, Environmental and climate change data analysis</p> <p>Environmental and feasibility assessment in target sites</p> <p>Output 4.2. Construction of wetlands</p> <p>Capacity building for the Government and community on O&M of wetlands</p> <p>Technical support on innovative and lateral learning platform</p>
	<p>Breakage of waterways and drainages</p>	<p>Limited restoration capacity</p> <p>Lack of DRR measures</p>	<p>Sanghar District, Sindh Province Chotiario Sethar Pir</p> <p>Umarkot District, Sindh Province Doronaro</p>	<p>Output 5.1. Feasibility study on ground-truthing of catchment and restoration of ponds</p> <p>Preparation of detail designs and BOQs for community ponds</p>

Climate Change Hazards	Impact on Community	Underlying Vulnerability / Barriers to Adaptation	Target Community Affected	Activity Proposed
			Umerkot	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 Umarnkot 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

G. 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. IPCC and ICIMOD projected scenarios underline the need for an adaptive approach to the management of water resources of the Indus in Pakistan. Changes in water availability affect energy and industry, eventually affecting macroeconomic performance. Khan et al. (2020) estimated that, under the extreme scenario, by 2050, agriculture production will decrease in Pakistan and a decline in GDP of 3.7 per cent of base value – a total loss of over US\$ 19.5 billion to the Pakistan economy, primarily due to water management challenges. Impact of Climate Change on Children in Pakistan study -2021 of the MoCC&EC shows that almost 66% of climate change-related loss to Pakistan will be because of water, temperature and related effects on agriculture, diseases, and nutrition. In all South Asia, the projected changes in the future availability of meltwater and groundwater depletion will require rapid adaptation to a more resilient form of water management, a more innovative approach to DRR, and early warning.

Accordingly, 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.

Compared to other approaches, the Proposed Project has a definitive advantage in that Both ICIMOD and UNICEF have long-standing working relations with the Government of Pakistan. 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 emphasize 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 capacity to construct, replicate and maintain the constructed hard.
- 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 the overall knowledge base available to the partners of the Living Indus Initiative, and the sector more generally.

This approach will ensure that the adaptation benefits per dollar invested are leveraged while producing concrete per beneficiary impact 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 the component on awareness raising and KM. 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 8 is indicative in nature, the 2023 census results for Pakistan are currently being finalized and will be updated as soon as available.

Table 8: Component-wise benefits

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 is available to the community, local leaders, and through Component 6 to provincial and national authorities	Cryosphere hazards are rapidly changing and evolving phenomenon, accordingly a localized risk mapping informs the specific community-based monitoring required.
1.2: Community-based monitoring and early warning systems established.				Loss of life mitigated through disasters.	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.				Destruction of infrastructure and new construction due to disaster mitigated.	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 spring-sheds 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 stabilized 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; revitalizing 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 spring-shed 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 spring-shed established with enhanced institutional capacity for efficient					Finally, when combined with flow monitoring and water use governance, the cost efficacy gains are leveraged and sustained.

Output	Target Area	No. of Beneficiaries	Cost per Beneficiary (US\$)	Economic Benefit	Logic
water resource management.					
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.	Swat	30,000	14.6	Conservation and recharging of groundwater 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.	By actively managing and preserving groundwater resources, it ensures the long-term availability of water for various uses. sustainable 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.
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 health conditions and water security of the community and reduce HH medical costs. In addition, the time saving from fetching water can also be used for other economic activities by beneficiaries. By engaging communities for construction works, the project will contribute for building local knowledge and skills and create livelihood for community members.	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
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 mobilization 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 mobilize 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 urbanization. Constructed wetlands contribute to climate change resilience by serving as a sustainable wastewater management solution. They can accommodate fluctuating water flows, including heavy rainfall events and periods of drought, thus providing resilience to changing climate conditions.	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.
5.1: Government of Sindh supported in	Sindh Province-Sujawal, Umarkot,	NA	NA	Comprehensive study output will help to have appropriate and	The logic is by spending some funding for comprehensive study it will have an

Output	Target Area	No. of Beneficiaries	Cost per Beneficiary (US\$)	Economic Benefit	Logic
systematically prioritising 15 natural waterways and community water ponds to address water storage and wastage issues.	Tharparkar and Sanghar districts			optimum designs of restoration activities which will have an economic benefit by recommending cost effective and contextualized solutions that take into account local and indigenous practices which reduces inefficient use of resources for construction and restoration	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, Umarkot, Tharparkar and Sanghar districts	30,000	32.5	Surface water conservation practices will help to increase freshwater availability and improve ground water quality through increased recharge. This will reduce cost of water treatment as surface water need simple filtration while saline ground water 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 improve health conditions and water security of communities. 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 community. By managing water resources effectively, communities can mitigate the negative effects of climate variability, maintain stable	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.

Output	Target Area	No. of Beneficiaries	Cost per Beneficiary (US\$)	Economic Benefit	Logic
				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 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 increased financing for the country for climate change adaptation.	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 will reduce misuse of water resources which in turn will increase water availability for other activities that will lead to additional economic benefits. In addition, this can generate revenue from heavy water users like commercial agriculture and industrial use which can help for capital investment to expand coverage and reach more vulnerable people with services. Moreover, improved coordination, and inclusive practices, IM, and evidence generation capacity at federal and provincial level will have an economic benefit by improving efficiency, reducing duplications, and expanding access to new financing for climate change adaptation.
6.2: An extensive knowledge repository on climate change and WASH practices developed.	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 targeted KM products and locally-led and inclusive platforms for experience sharing, advocacy and programme design will increase investment for climate adaptation and improve efficiency as it leads to focused intervention based on experience of the past and in different locations.

Output	Target Area	No. of Beneficiaries	Cost per Beneficiary (US\$)	Economic Benefit	Logic
					Potential of knowledge and skill transfer to other locations outside the targeted districts.
6.3: Community-led adaptation solutions widely adopted through awareness-raising and behavioural change.	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 knowledge and awareness on impact of climate change, 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.

Table 8 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.

G.1. 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 Motorized 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	Industrial Wastewater Treatment	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	Large scale water treatment and recycling 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

H. Alignment with National or Sub-national Sustainable Development Strategies

The proposed project aligns with Pakistan's national climate-related policies and commitments in several ways:

- **NAP 2023:** Under the climate impacts that plan seeks to address it specifically lists: (i) flooding and water scarcity in GB and KP due to glacial retreat, which Components 1 and 2 explicitly address (ii) groundwater overuse which components 3 and 5 address (iii) Component 4 explicitly supports the governments stated adaptive priority of building urban resilience considering an increasingly urban population.
- The proposed programme 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) minimize 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 program 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 mobilization; 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 upscaling:** The project emphasizes 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 is aligned closely with the aims of the 2022 Living Indus Initiative, which UNICEF and NRSP were 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:** 2022 adopted 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. Moreover, the programme 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 prioritization 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.

Table 9: Complementarity with Pakistan's 2021 Updated NDCs

NDCs – Priority Area	Corresponding Project Component / Output
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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 programs	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;	Awareness Raising and Knowledge Management
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.	Awareness Raising and Knowledge Management

I. Compliance with National Technical Standards and Environmental and Social Policy of the Adaptation Fund

I.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 paramount priority. The project impeccably 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 licenses, 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.

I.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.

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.²⁸
- Special attention has been given to principles 7 and 14, concerning the Kailash Valley and its indigenous population, drawing learning 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.

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:

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

²⁸ ICIMOD. (2022). State of gender equality in South Asia and the Hindu Kush Himalayas. ICIMOD Library. [Link](#)

- 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

- Tailored designs for ditches and trenches adhere to PEPA Groundwater Recharge Structures Guidelines.
- 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 licenses enhances 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.

As the project formulation progresses, this comprehensive approach will be further augmented with province-specific regulations and more granular activity-based information.

J. 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. On the contrary, the project concept design team has worked to ensure that the Proposed 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.

Table 10: Complementarity to other projects

Relevant Project	Description	Goals	Complementary potential	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.	2018 – (no set end date)

Relevant Project	Description	Goals	Complementary potential	Project Timeline
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.	Mobilize 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.	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 Proposed Project. The UN Women contribution to this project under Component 6 will be key in this regard.	2022 – 2029 (approximately)
Scaling-Up of Glacial Lake Outburst Flood (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) project. GLOF-I helped vulnerable communities prepare for and mitigate GLOF risks through community-based CBFWS, enhanced infrastructure and community-based disaster risk management. ICIMOD has provided considerable technical support to this project.	Empower communities to identify and manage risks associated with GLOFs and related impacts of climate change, strengthen public 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.	The Proposed Project cryosphere will complement the current geographic coverage of GLOF Phase II and link the communities to a community led DRR system that reaches further downstream, leveraging the impact of GLOF and increasing the cost-effectiveness of the proposed Project.	2017 - 2023
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 Proposed Project's community led DRR mechanisms will serve to mitigate some degree of crop loss.	2019 - 2026
Enhancing community, local and national level urban climate change	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,	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	Scaling of solutions on water conservation and managing climate change risks piloted at Nowshera and Rawalpindi in the larger areas through	2020-2023

Relevant Project	Description	Goals	Complementary potential	Project Timeline
resilience to water scarcity, caused by floods and droughts	and water scarcity to plan for and manage climate change risks.	Rawalpindi and Nowshera cities.”	collaboration with national and provincial agencies.	
Recharge Pakistan: Building Pakistan’s resilience to climate change through Ecosystem-based Adaptation (EbA) and Green Infrastructure for integrated flood risk management	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 2. Enhancing the resilience of vulnerable communities to climate change 3. Enabling a paradigm shift towards ecosystem-based adaptation in Pakistan	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 ecosystems-based adaptation (EbA) and green infrastructure interventions, as well as enhancing community-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.	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.	2023-tbd

K. 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 - Awareness Creation and KM reflects this importance. The proposed concept will be able to avoid duplication and maximize results through synergies, leveraging resources and lessons learned 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 organizational 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 learned 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 contextually specific sites.

Organized demonstration of proven solutions in pilot communities will 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: Crowdsourcing knowledge menu item. Component 6 of this project will serve as the nascent core of the Initiative to build upon. To this end, NRSP as the local implementing partner will progressively take ownership of the overall KM processes, with initial support from UNICEF.

L. 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; these tested the contextual appropriateness of the individual adaption solutions proposed, and their potential GESI-related gains.

Table 11 presents details of all consultations held with governmental and development sector actors.

Table 11: 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 formalizing the engagement.	1. P&D Department appreciated the NBS based approach for tackling 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 stabilization 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.

Date	Stakeholder, incl. Role/Function	Consultation Objectives	Outcome	Conclusion
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. 3. Identify any potential concerns regarding legal compliance of the proposed approach.	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 formalize its partnership with CEWRI under SAFER Pakistan during the inception phase.
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 ground water recharge. 2. Identify any potential concerns regarding legal compliance of the proposed approach.	1. PCRWR collaborated with UNICEF and ICIMOD to develop ground water 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 on-going initiative on "Climate Resourcing Coordination Centre (CRCC)" which aims to mainstream climate action into the national economic and development strategy. 2. Their interest in synergizing the initiative through SAFER project.	Taking part in the implementation of other components was considered after the award of the project along with other local organizations engaged by the ICIMOD and UNICEF.

Date	Stakeholder, incl. Role/Function	Consultation Objectives	Outcome	Conclusion
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: 1. Ensure that the project design of SAFER aligned with the Ministries emerging priorities. 2. Integrate the project further in the Living Indus Initiative	MoCC recommended NRSP to manage the Km of the SAFER project under Component 6 to integrate the project fully in the living Indus initiative.	NRSP is formally invited to take a leading role in 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 National Project Director (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 operationalization 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

Date	Stakeholder, incl. Role/Function	Consultation Objectives	Outcome	Conclusion
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 Management Agency	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. 3. Identify capacity building needs of the KPDMA, and other relevant partners and communities regarding cryosphere hazards.	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 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	Formal partnership negotiations will be opened with ICIMOD upon the AF Board decision. ICIMOD will integrate the KPDMA's input into the project design. The sites selected proposed by ICIMOD were validated by KPDMA and Kalash Valley has been added based on their input

The community consultations were held to learn about their views on climate adaptation and proposed intervention in their locality in SAFER Pakistan and learn from them about potential benefits as well as possible risks or challenges of proposed intervention. Communities were also asked about their views on feasibility of proposed budget and beneficiaries envisaged through the proposed intervention. Community suggestions were welcomed which have been documented separately. Table 12 presents the details of community consultations.

Table 12: 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.
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	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 programmes and expressed their benefits for adapting climate change and improving their living conditions and showed support during project implementation.
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			
Bachal Shah from New Sukkur, Sukkur (Province: Sindh)	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 recognized sewage treatment plant advantages, like reduced disease burden and	Bachal Shah community sees some project benefits, is keen on government

Community	Proposed intervention	Outcome	Conclusion
M:22 W:17 B:12 G:14		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	sewage plant with O&M budget. Suggests using other flood protection and water filtration measures for drinking water and waterborne disease prevention.
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	Community acknowledges climate change impact: changing precipitation, water scarcity, and groundwater depletion awareness and its adaptation. Positive response to water supply scheme for area; foresees benefits for 4400+ households. Concerns about future operation by government and construction quality; emphasizes 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	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. Concerns about potential worsened drainage and funding delays if not well-implemented. 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	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
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			
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

Community	Proposed intervention	Outcome	Conclusion
Ali Akbar Shah from Chotario, 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
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	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. Positive response to solarizing scheme for wider reach (15,000 households). Further technical study and stakeholder consultations needed for intervention design.	Proposed intervention is feasible
Bulchi from Bugrout, 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 prioritized possible interventions in a facilitated session for Bugrout 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 Bugrout, 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	Proposed intervention is feasible
Shala Khel from Nowshera, Nowshera (Province: Khyber Pakhtunkhwa)	Stabilization of Riverbank sites through vegetation	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.	

Community	Proposed intervention	Outcome	Conclusion
M:11 W:11 B:0 G:0		WOMEN: 35 % saw control in disease prevalence.	
Misal Abad from Nowshera, Nowshera (Province: Khyber Pakhtunkhwa) M:11 W:11 B:0 G:0	Constructed Wetlands	Noted reduced water-fetching burden. 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.	
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	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	
Baro khel kanday from Shabqadar (Province: Khyber Pakhtunkhwa) M:11 W:11 B:0 G:0	Stabilization of Riverbank sites through vegetation	Proposed interventions expected to benefit about 6,770 households in KP communities. 5. Community recommendations for climate adaptation: Raise awareness and mobilize communities for climate resilience.	
Lalma Dheri from Charsadda, Charsadda (Province: Khyber Pakhtunkhwa) M:11 W:11 B:0 G:0	Constructed Wetlands	Plantation to avoid land erosion. Advanced agriculture practices and compatible seeds No construction at river side	
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		
Ghari Lagan from Bahrain, Swat (Province: Khyber Pakhtunkhwa) M:11 W:11 B:0 G:0	Stabilization of Riverbank sites through vegetation		
Dhenkanal from Madian, Swat (Province: Khyber Pakhtunkhwa)	Constructed Wetlands		

Community	Proposed intervention	Outcome	Conclusion
M:11 W:11 B:0 G:0			

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

M. Justification for Funding Requested

Table 13 outlines the cost of adaptation reasoning at a component level, as consultations are concluded an

Table 13: 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	<p>The population in the Upper Basin are vulnerable to loss of life and property due to limited early warning of impending climate-related cryosphere hazards.</p> <p>Policymakers are not able to accurately amortize infrastructure investment, leading to ineffective investment decisions.</p> <p>Infrastructure Development in the Upper Basin does not benefit from climate-resilient land use planning, leading to increased destruction of property during disasters.</p>	<p>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.</p> <p>Policymakers have better information on cryosphere-related risks to infrastructure, improving infrastructure investment decisions.</p> <p>Construction will be undertaken in more climate-resilient sites, reducing the destruction of property due to climate induced cryosphere disasters.</p>	<p>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.</p> <p>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.</p>
Component 2: Springshed Revival and Management	<p>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.</p> <p>Policymakers are not able to rely on springs as a source of municipal water, driving more unsustainable groundwater drilling.</p>	<p>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.</p> <p>Policymakers can make climate-resilient municipal water supply plans in the middle Basin and are equipped to scale up the approach in other communities</p>	<p>Springshed revival is a proven methodology that has been developed by ICIMOD in cooperation with communities in Pakistan and Nepal.</p> <p>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.</p>
Output 3.1: Groundwater mapping and groundwater recharge facilities completed in selected water- scarce locations in	<p>Current groundwater extraction rates are not sustainable and risk exhausting it entirely and causing irreparable damage to communities, livelihoods, and the national economy,</p>	<p>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.</p>	<p>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</p>

Component/ Output	Baseline (without project)	Adaptation impact (with project)	Evidence base related to the Adaptation Solutions
the Middle Basin, including establishing/strengthening operation, maintenance, and management structures.	which relies heavily on it for water-reliant exports.		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.
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 due 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 mobilize 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 mobilization 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	Lack of appropriate studies and comprehensive basin management plan in targeted	The comprehensive study in the targeted locations will help to have basin management plan	Experience in multiple locations and communities indicated that communities

Component/ Output	Baseline (without project)	Adaptation impact (with project)	Evidence base related to the Adaptation Solutions
systematically prioritising 15 natural waterways and community water ponds to address water storage and wastage issues.	locations in Sindh flooding is recurrent which resulted in stagnant water across the settlements and community institutions.	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 storage locations and reduce water logging in the settlement areas.	and local governments can mobilize to implement local level solutions to reduce water logging and improve water storage. However, limited/lack of all required knowledge and skills either restrict their participation or reduce the impact of their interventions to implement the contextualized adaptation measures.
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.	Currently in targeted areas ground water salinity is very high and not many freshwater alternatives for the communities. Which resulted in local authorities and CSO to relied on expensive reverse osmosis treatment facilities which increase in water cost. In addition, due to limited investment on improving natural water ways flood and rainwater in target locations create water logging in settlements, schools, health centres and other community facilities.	With this intervention the community adaptive capacity will increase by reducing water logging in the settlement areas and identifying and improving appropriate locations for water storage through community ponds. The ponds will also improve the water quality in the area through ground water recharge and provide alternative water source with low treatment costs than saline ground water.	Experience in multiple countries including Pakistan shows that community ponds are viable solutions for water 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.	<p>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.</p> <p>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</p>	<p>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.</p>	<p>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.</p> <p>The capacity of the government is key on coordination of partner's support, identification of priorities and implementation and oversight of the climate change adaption programmes.</p>

Component/ Output	Baseline (without project)	Adaptation impact (with project)	Evidence base related to the Adaptation Solutions
	outreach of the initiative across the country, coordinate partners support and mobilize additional resource is very limited.		
Output 6.2: An extensive knowledge repository on climate change and WASH practices developed.	There is no centralized KM platform that document, disseminate innovations, new approaches and experiences for different adaptation interventions and studies being done by government, development partners, CSOs and communities.	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 experience of the communities targeted by this project.	Data and KM platforms will facilitate learning, scaling up of interventions in different areas adoption of tested knowledge and practices and for evidence-based advocacy for increased investment.
Output 6.3: Community-led adaptation solutions widely adopted through awareness-raising and behavioural change.	Communities not implementing adaptive practices, limited community participation (especially women and girls) in adaption programmes.	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 will enhance ownership on adaptation and climate risk reduction processes.

N. Sustainability Considerations

Improved and sustainable water management is critical to building the resilience of communities and can support the stabilization of situations in which environmental pressures, rising demand for water, shifting and unreliable water supplies that could ultimately lead to welfare of communities and sustainable development in the region.

The sustainability for this project encompasses various dimensions, mirroring a comprehensive strategy. The focus is on developing nature-based solutions ensuring communities are actively involved in decision-making processes is an essential part of the sustainability approach of the project. Institutional sustainability involves planning for system and service level improvements. 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 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 children, making sure their needs related to project activities are understood.

The interventions to support targeted sustainability of each project component related to the elements of technical, socio-economic, environmental, and institutional are highlighted in Table 14.

Table 14: Sustainability interventions

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.	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Establish community watch groups for maintenance and ownership of CB-MEWS.

Project Components / Outcomes	Outputs	Sustainability Interventions
	warning systems established.	<ul style="list-style-type: none"> 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.	<ul style="list-style-type: none"> 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.
<p>2. Springshed Revival and Management</p> <p>Outcome 2: Increased access to spring water in climate adaptive and gender inclusive manner.</p>	2.1: A comprehensive web-based information management system of spring-sheds and springs prepared for Malakand and Hazara divisions.	<ul style="list-style-type: none"> 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 spring-shed practices, land use planning, and bioengineering) co-developed and implemented.	<ul style="list-style-type: none"> 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 spring-shed established with enhanced institutional capacity for efficient water resource management.	<ul style="list-style-type: none"> Establishment of local level management, and operations rules for springs in collaboration with local communities and municipal administration Policy level engagement for clarity on roles, responsibilities, and powers of various stakeholders involved in the management of springs water resources linked to Component 6. integrating springs water governance mechanisms into national water policies and provincial regulations, neglected spring water ecosystems
<p>3. Groundwater Management and Resilience Community Water Supply</p> <p>Outcome 3: Improved climate-resilient management of groundwater and community water supply services in vulnerable areas.</p>	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.	<ul style="list-style-type: none"> Conduct groundwater mapping at district level. Undertake feasibility study as part of site identification. Develop site for recharge as per topographic and geological conditions. Installation of water quality meters to support active monitoring. Establish and train community-based structures for operation and maintenance of facilities. Develop technical training courses for technicians and operators of Local Government Academies with support of academia.
	3.2: Climate-smart and resilient water supply infrastructure established	<ul style="list-style-type: none"> Identification of vulnerable areas/site selection, including environmental assessment of water available and need per site.

Project Components / Outcomes	Outputs	Sustainability Interventions
	in selected sites, along with contextually relevant management structures with adequate capacity for operation and maintenance of the community infrastructure.	<ul style="list-style-type: none"> • Ensure infrastructure is designed in a resilient manner (solarization, lead handpumps, etc.). • Establish and strengthen community water management structures, including WASH committees and local technicians. • Link established between community and relevant service providers for technical backstopping.
<p>4. Ecosystem-Based Adaptation</p> <p>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 solutions.</p>	<p>4.1: Targeted intervention sites identified for evidence based, climate adaptive and focused WASH interventions.</p>	<ul style="list-style-type: none"> • 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—better planning on EBA.
	<p>4.2: NbS for sewage treatment demonstrated through constructed wetlands along with proper management structures and adequate capacity for operation and maintenance of wetlands.</p>	<ul style="list-style-type: none"> • Site selection, including an understanding of environmental and communal needs and understanding of EBA requirements and provision of land. • 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. • Provide technical support, innovative and lateral learning platform, and equipment for operation of STPs.
<p>5. Surface Water Conservation</p> <p>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.</p>	<p>5.1: Government of Sindh supported in systematically prioritising 15 natural waterways and community water ponds to address water storage and wastage issues.</p>	<ul style="list-style-type: none"> • 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.
	<p>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.</p>	<ul style="list-style-type: none"> • Restore/rehabilitate selected natural waterways in Sindh as per site selection and appropriate environmental assessment. • Install automatic water quality monitoring systems to support real-time monitoring. • Establish communal pond management committees to promote efficiency of pond management and operation.
<p>6. Adaptive Capacities and empowered communities for strengthened resilience to climate change</p>	<p>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</p>	<p>All activities under component 6 contribute directly to the sustainability of project activities.</p>

Project Components / Outcomes	Outputs	Sustainability Interventions
	towards management of Indus water resources.	
	6.2: An extensive knowledge repository on climate change and WASH practices developed.	
	6.3: Community-led adaptation solutions widely adopted through awareness-raising and behavioural change.	

O. Environmental and Social Impacts and Risks

The Environmental and Social Impact Assessment (ESIA) for the ensuing project has been conducted in a systematic manner, starting with initial environmental and social (E&S) screening and broader assessment at the Concept Note stage, followed by more detailed E&S impact analysis, and E&S management planning for the environmentally and socially sensitive activities planned under the project. According to the E&S screening, most of the project interventions fell under Category C, requiring no further E&S assessment and management planning while only a few interventions are under Category B, but not requiring full scale E&S impact assessment (Table 15).

Table 15: E&S categorisation of proposed interventions

E&S Category	Outputs
A	None
B	<p>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.</p> <p>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.</p> <p>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.</p>
C	<p>Output 1.1: Integrated cryosphere risk mapping through community engagement.</p> <p>Output 1.2: Community-based monitoring and early warning systems established.</p> <p>Output 1.3: Strengthened resilience to cryosphere-related risks.</p> <p>Output 2.1: A comprehensive web-based information management system of spring-sheds and springs prepared for Malakand and Hazara divisions.</p> <p>Output 2.2: Recharge measures (for improved spring-shed practices, land use planning, and bioengineering) co-developed and implemented.</p> <p>Output 2.3: Local governance framework for spring-shed established with enhanced institutional capacity for efficient water resource management.</p> <p>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.</p> <p>Output 4.1: Targeted intervention sites identified for evidence based, climate adaptive and focused WASH interventions.</p> <p>Output 5.1: Government of Sindh supported in systematically prioritising 15 natural waterways and community water ponds to address water storage and wastage issues.</p> <p>Output 6.1: National and provincial capacities strengthened to apply innovative social and technological tools for establishing and enforcing human-centred and gender-</p>

E&S Category	Outputs
	transformative systems of 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.

At the same time, the project interventions were screened against the 15 Environmental and Social Policy principles of the Adaptation Fund. The overall E&S assessment from the ESP lens is summarised below.

1. Compliance with the Law

As per national and subnational environmental protection laws, the activities planned under outcomes 1, 2 and 6, having no environmental and social impacts, hence; categorised as C and do not require any environmental and social assessments (ESAs). Similarly, some of the planned activities under outcomes 3, 4 and 5 also fall under Category C (Table 15).

Some activities under outcomes 3, 4 and 5 are expected to have environmental and social impacts; hence, categorised as B (Table 15) and would require ESAs at the implementation stage as per scope of the activity and the E&S legislation of the relevant geography within Pakistan as following:

- Activities under outputs 3.2, 4.2 and 5.2 (solar-powered water facilities, constructed wetlands, sewage treatment plants, community ponds) in Sindh will require development and submission of Checklists to the Sindh Environmental Protection Agency (EPA).
- 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 15. An environmental and social management plan (ESMP) has also been developed accordingly and presented in Annex 3.

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 and inclusive benefit sharing through the project interventions without any discrimination or favouritism.

3. Marginalised and Vulnerable Groups

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.

The disaggregated data collection and reporting during the project implementation will ensure that neither marginalised nor vulnerable groups face any disproportionate risk.

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 cognisant of this ESP principal for chance find and keep reporting on it regularly. Moreover, human rights based approach will be a guiding principle of the programme implementation.

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. Moreover, the programme will integrate gender-responsive approach in all of its components. 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 IE and EE 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, and meaningful representation of women at all decision-making forums and participation in the implementation and monitoring of project activities.

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 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 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 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.

8. Involuntary Resettlement

The ESIA 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 outcomes 3, 4 and 5 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 15. The applicable ESAs will also be conducted during the implementation, to find any cases of involuntary resettlement. If so, the site will either be replaced with voluntarily available site or acquired through negotiated resettlement under the Land Acquisition Act, 1894.

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 ground water contamination through its activities under outcomes 3, 4 and 5. 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.

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 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 activities under outputs 3.2, 4.2 and 5.2 (solar-powered water facilities, constructed wetlands, sewage treatment plants, community ponds) and will implement all preventive and mitigation measure proposed by the ESMP (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 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. None of the project sites under outputs 3.2, 4.2 and 5.2 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.

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 2: Indicative work plan for the project

Component/ Outcome	Output	Activity	2024		2025				2026				2027				
			Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
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															

Component/ Outcome	Output	Activity	2024		2025				2026				2027				
			Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
		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 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															

Component/ Outcome	Output	Activity	2024		2025				2026				2027				
			Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
		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 spring-sheds 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.															
	Output 2.2: Recharge measures (for improved spring-shed 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															

Component/ Outcome	Output	Activity	2024		2025				2026				2027			
			Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
		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 spring-shed 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 3: Groundwater Management and Resilience of Community	Output 3.1: Groundwater mapping and groundwater recharge facilities	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														

Component/ Outcome	Output	Activity	2024		2025				2026				2027				
			Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Water Supply Services Outcome 3: Improved climate-resilient management of groundwater and community water supply services in vulnerable areas.	completed in selected water-scarce locations in the Middle Basin, including establishing/strengthening operation, maintenance, and management structures.	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 (LGAs), 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 Charsada, 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.															
		Component 4: Ecosystem-based Solutions	Output 4.1: Targeted intervention sites identified for evidence based, climate	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.													

Component/ Outcome	Output	Activity	2024		2025				2026				2027				
			Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
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 solutions.	adaptive and focused WASH interventions.	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).															
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	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,															

Component/ Outcome	Output	Activity	2024		2025				2026				2027					
			Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4		
	systems and establishing and strengthening operation, maintenance, and management structures.	Sujawal and Tharparkar districts of Sindh.																
		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: Conduct gap analysis of groundwater legislation at the provincial and federal levels and recommend and support implementing tangible actions for drafting new groundwater acts in KP and Sindh provinces.																
		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.																
		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.																
		6.1.4: Develop and deploy capacity-building support to regulatory authorities in GB, KP and Sindh to effectively enforce groundwater regulations.																
		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.																
		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.																

Component/ Outcome	Output	Activity	2024		2025				2026				2027				
			Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
		6.1.7: Support the government of Pakistan in improving coordination among water sector stakeholders in Sindh and KP provinces, especially the government departments from different provincial/area governments, through KM products.															
		6.1.8: Facilitate improved knowledge and practices of policy makers on WASH and climate change.															
	Output 6.2: An extensive knowledge repository on climate change and WASH practices developed.	6.2.1: Integrate the CGPCP data into the Living Indus Knowledge Platform: Crowdsourcing Knowledge Platform.															
		6.2.2: Organise a workshop to validate the indicators for contextual appropriateness, focusing on Sindh, KP and GB.															
		6.2.3: Undertake district-level training sessions in 15 districts of the proposed programme in Sindh, KP and GB provinces to train the district government staff in data collection and data entry in CGPI web portals.															
		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 programme, i.e., Water, Sanitation, Hygiene, Liquid and Solid Waste Management and Plantation.															
		6.2.5: Provide technical support to the MoCC&EC to review the climate adaptation data against indicators being reported by districts.															
		6.2.6: Expand the Clean Green Pakistan Champions Programme (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.															
		6.2.7: Support the initial production of three six-month database															

Component/ Outcome	Output	Activity	2024		2025				2026				2027			
			Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
		analyses and dissemination to decision-makers and stakeholders at the national and provincial levels as part of the Living Indus Initiative monitoring mechanism.														
		6.2.8: Create a comprehensive database of all climate adaptive NbS and EbAs technologies used in the Indus Basin, their cost, efficacy, and contextual prerequisites.														
		6.2.9: Development of National Indus Water Atlas web portal with GIS modelling and geotagging.														
		6.2.10: 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.														
		6.2.11: Support production and dissemination of KM products, including One Catalogue of appropriate technologies and NbS for different Indus River basin geographical zones, four technical papers on specific activities of the programme for replication elsewhere, One Catalogue of water sector stakeholders from the private sector, academia and research organisations, development, and donors, CSOs and CBOs, and government/semi-government organisations with geographical presence and capacities for partnership in the Indus basin and six success stories/case studies.														
	Output 6.3: Community-led adaptation solutions widely adopted through awareness-raising and behavioural change.	6.3.1: Build Public-Private Partnerships (PPPs) across the basin with private sector actors in the sanitation, construction, and finance sectors.														
		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.														

Component/ Outcome	Output	Activity	2024		2025				2026				2027			
			Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
		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.														
		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.														
		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.														
		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.														
		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.														
		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). However, the project will not implement any activity on productive and valuable lands in the project areas.

O.1. Environmental and Social Impact Analysis

Building upon the initial E&S 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 under outputs 3.2, 4.2 and 5.2 have been found having some adverse but reversible environmental and social impacts. The activities planned under rest of the outputs, and some of the activities even under outputs 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.

Table 16 provides an overview of the project's proposed activities under outputs 3.2, 4.2 and 5.2 (Category B) and their potential risks and impact assessment against the 15 principles. Table 16 describes the potential impacts those could be reasonably expected if no risk management or mitigation measures are put in place.

Table 16: E&S impact analysis

Project Output and Activities under Category B	E&S Impacts Based on ESP Principals	E&S Impact Analysis	E&S Mitigation and Monitoring
<p>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.</p> <p>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.</p> <p>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 Charsada, Swat and Nowshera districts of KP province.</p> <p>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.</p>	<p>1. Compliance with Local Law The project ensures strict compliance with local environmental laws, ensuring that all construction activities, waste disposal, and community engagement practices adhere to the legal framework. This commitment establishes a foundation for responsible and sustainable development.</p> <p>2. Access and Equity By focusing on flood-prone areas in Sindh province, the project aims to eliminate historical disparities in water access. This targeted approach ensures that vulnerable communities, often marginalised, gain equitable access to reliable water supply services, fostering social equity.</p> <p>3. Marginalised and Vulnerable Groups The project specifically addresses the needs of marginalised groups in flood-prone regions. By providing sustainable water solutions to these vulnerable populations, the project directly contributes to enhancing their resilience against climate-related challenges.</p> <p>4. Human Rights The provision of sustainable water supply services directly aligns with the fundamental human right to access clean water. This aspect of the project actively contributes to fulfilling basic human rights and enhancing the overall quality of life for the communities involved.</p> <p>5. Gender Equality and Women Empowerment Through targeted training programs for WASH committees and local technicians, the project actively promotes gender equality. The empowerment of women in water management and decision-making processes is a specific outcome, addressing gender disparities in the region.</p> <p>6. Core Labour Rights The project upholds core labour rights by providing fair and safe working conditions during construction and operation phases. The emphasis on job creation and skill development initiatives contributes positively to the local labour market, fostering social and economic development.</p> <p>7. Indigenous Peoples</p>	<p>ENVIRONMENTAL IMPACTS</p> <p>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.</p> <p>Negative Impacts Construction Impact: The construction phase may result in temporary habitat disruption and soil erosion, requiring mitigation measures to minimise environmental degradation.</p> <p>SOCIAL IMPACTS</p> <p>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 well-being. Community Empowerment: Training of WASH committees and local technicians will empower communities to manage and</p>	<ul style="list-style-type: none"> • Implement phased construction to minimise disruption. • Implement erosion control measures during construction. • Conduct regular environmental monitoring during and after construction. • Develop a comprehensive resettlement plan for any displaced communities. • Establish a grievance mechanism for addressing community concerns. • Implement a local hiring policy to maximise economic benefits for nearby communities. • Regularly review and update the project budget to address any unforeseen economic challenges. • Enforce strict safety protocols during construction. • Provide adequate training for

Project Output and Activities under Category B	E&S Impacts Based on ESP Principals	E&S Impact Analysis	E&S Mitigation and Monitoring
<p>Activity 3.2.4: Establish/strengthen community water management structures, including training WASH committees and local technicians</p>	<p>While the project doesn't explicitly target indigenous groups, it commits to conducting thorough assessments. In case indigenous populations are identified, measures will be implemented to respect and preserve their cultural heritage, safeguarding their rights and traditions.</p> <p>8. Involuntary Resettlement The project's focus on existing flood-prone areas minimises the risk of involuntary resettlement. This strategic approach mitigates potential social disruptions and displacement, ensuring the preservation of community structures and livelihoods.</p> <p>9. Protection of Natural Habitat Construction activities for climate-resilient infrastructure prioritise the protection of natural habitats. The project incorporates specific measures to minimise disruption, preserving local ecosystems and maintaining ecological balance.</p> <p>10. Conservation of Biological Diversity The commitment to climate-resilient infrastructure aligns with the conservation of biological diversity. Environmentally conscious practices are integrated, contributing to the preservation of the rich variety of flora and fauna in the project areas.</p> <p>11. Climate Change The installation of climate-resilient infrastructure directly addresses the impacts of climate change on water supply. The project not only adapts to changing climate conditions but also mitigates future risks, actively contributing to broader climate change resilience efforts.</p> <p>12. Pollution Prevention and Resource Recovery Specific initiatives, including the use of solar-powered water facilities and pollution prevention measures, actively promote environmental sustainability. This targeted focus on clean energy and pollution prevention aligns with responsible resource management practices.</p> <p>13. Public Health Implementation of sustainable and climate-resilient water supply services is anticipated to result in specific improvements in public health. Reduced waterborne diseases and enhanced community health outcomes</p>	<p>maintain the water supply infrastructure independently.</p> <p>Negative Impacts Displacement during Construction: Temporary displacement of communities during construction may occur, necessitating the provision of alternative housing and resources.</p> <p>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.</p> <p>Negative Impacts Construction Costs: Initial construction costs may strain the project budget, requiring careful financial planning.</p> <p>HEALTH AND SAFETY IMPACTS Improved Health Conditions: Access to clean water will reduce waterborne diseases, positively impacting public health. Safety Risks during Construction: Construction activities pose safety risks, requiring strict adherence to safety protocols to prevent accidents.</p>	<p>construction workers on health and safety practices.</p>

Project Output and Activities under Category B	E&S Impacts Based on ESP Principals	E&S Impact Analysis	E&S Mitigation and Monitoring
	<p>highlight the direct positive impact on the well-being of the project's beneficiaries.</p> <p>14. Physical and Cultural Heritage While the project doesn't directly impact physical or cultural heritage, precautionary measures are implemented. These measures aim to prevent inadvertent damage during construction and operation, preserving the historical and cultural elements of the project areas.</p> <p>15. Lands and Soil Conservation To promote sustainable development, climate-resilient infrastructure incorporates specific measures for land and soil conservation. Erosion control measures are meticulously implemented to minimise soil disturbance, ensuring the long-term integrity of local land resources.</p>		
<p>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.</p> <p>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 and Khairpur districts of Sindh province based on proven UNICEF methodology, reducing urban effluent, and increasing water availability.</p> <p>Activity 4.2.2: Strengthen existing government and community</p>	<p>1. Compliance with Local Law The project ensures strict adherence to local environmental laws and regulations in the installation of constructed wetlands. This guarantees that sewage treatment practices align with the established legal framework, promoting responsible and lawful environmental management.</p> <p>2. Access and Equity Through the installation of constructed wetlands, the project addresses access and equity concerns by targeting specific districts in KP and Sindh provinces. This targeted approach ensures that urban effluent reduction and increased water availability benefit communities that may face environmental inequities.</p> <p>3. Marginalised and Vulnerable Groups The project specifically benefits marginalised and vulnerable groups by implementing sewage treatment solutions in districts where these populations may face heightened environmental risks. The decentralised approach aims to uplift these communities, making them more resilient to climate change-induced shocks.</p> <p>4. Human Rights Improved sewage treatment directly contributes to the protection of human rights, particularly the right to a clean and healthy environment. By reducing urban effluent, the project enhances the overall quality of life for communities in the targeted districts.</p>	<p>ENVIRONMENTAL IMPACTS</p> <p>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.</p> <p>Negative Impacts Temporary Disruption: Construction activities may temporarily disrupt local habitats. Mitigation measures, such as phased construction, will be implemented to minimise disturbance.</p> <p>SOCIAL IMPACTS</p> <p>Positive Impacts</p>	<ul style="list-style-type: none"> • Strict enforcement of safety protocols during construction. • Provide adequate training for construction workers on health and safety practices.

Project Output and Activities under Category B	E&S Impacts Based on ESP Principals	E&S Impact Analysis	E&S Mitigation and Monitoring
<p>structures to operate and maintain the wetlands.</p> <p>Activity 4.2.3: Provide technical support, innovative and lateral learning platform, and equipment to service providers unable to operate Sewage Treatment Plants (STPs).</p>	<p>5. Gender Equality and Women Empowerment The project actively promotes gender equality by ensuring that the benefits of sewage treatment are accessible to all, regardless of gender. Women in these communities are expected to experience positive changes in their living conditions and health due to improved sanitation.</p> <p>6. Core Labour Rights In strengthening existing government and community structures for operation and maintenance, the project upholds core labour rights. This includes ensuring fair and safe working conditions for individuals involved in the operation of sewage treatment facilities.</p> <p>7. Indigenous Peoples While the project does not specifically target indigenous populations, measures are in place to avoid negative impacts. Cultural sensitivity is maintained, and assessments are conducted to identify and mitigate potential effects on indigenous communities if present.</p> <p>8. Involuntary Resettlement The nature of the project, focusing on sewage treatment in existing urban areas, minimises the risk of involuntary resettlement. This approach safeguards community structures and livelihoods, preventing disruptions associated with large-scale infrastructure projects.</p> <p>9. Protection of Natural Habitat Constructed wetlands are installed based on proven UNICEF/ICIMOD methodology, minimising disruption to natural habitats. The project aims to strike a balance between sewage treatment needs and the preservation of local ecosystems.</p> <p>10. Conservation of Biological Diversity The installation of constructed wetlands aligns with the conservation of biological diversity. By adopting proven methodologies, the project actively contributes to maintaining the balance of local flora and fauna.</p> <p>11. Climate Change Ecosystem-Based Adaptation, through the installation of constructed wetlands, directly addresses climate change impacts. The project's focus on reducing urban effluent and increasing water availability enhances climate resilience in the targeted communities.</p>	<p>Improved Water Access: Enhanced public health and well-being through increased access to clean water. Community empowerment through participation in project activities.</p> <p>Community Empowerment: Strengthening government and community structures empowers local communities. Enhanced community involvement in the operation and maintenance of wetlands.</p> <p>Capacity Building: Technical support enhances the capabilities of service providers in sewage treatment. Learning platforms promote continuous improvement and innovation.</p> <p>Negative Impacts Displacement during Construction: Temporary displacement of communities during construction.</p> <p>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 unable to operate STPs.</p> <p>Negative Impacts Construction Cost: Initial high construction costs may strain the project budget.</p>	

Project Output and Activities under Category B	E&S Impacts Based on ESP Principals	E&S Impact Analysis	E&S Mitigation and Monitoring
	<p>12. Pollution Prevention and Resource Recovery Constructed wetlands are effective in pollution prevention, contributing to the reduction of urban effluent. This eco-friendly approach aligns with responsible resource management practices, minimising the environmental impact of sewage treatment.</p> <p>13. Public Health Improved sewage treatment directly correlates with enhanced public health. The reduction of urban effluent mitigates health risks associated with waterborne diseases, positively impacting the well-being of the communities in the targeted districts.</p> <p>14. Physical and Cultural Heritage While the project does not directly impact physical or cultural heritage, precautionary measures are in place. These measures aim to prevent inadvertent damage during the installation and operation of constructed wetlands, preserving the historical and cultural elements of the project areas.</p> <p>15. Lands and Soil Conservation The project's approach to sewage treatment with constructed wetlands includes measures for lands and soil conservation. Erosion control and ecological considerations are implemented to minimise soil disturbance, ensuring the long-term health of local land resources.</p>	<p>HEALTH AND SAFETY IMPACTS Reduction in waterborne diseases through improved sewage treatment. Enhanced community health and well-being. Potential safety risks to workers and surrounding communities during construction.</p>	
<p>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.</p> <p>Activity 5.2.1: Restore/rehabilitate selected natural waterways in the</p>	<p>1. Compliance with Local Law The project ensures strict adherence to local environmental laws and regulations during the restoration and rehabilitation of waterways and ponds. This compliance is vital to ensure that all activities align with established legal standards, fostering responsible environmental management.</p> <p>2. Access and Equity The restoration and rehabilitation activities specifically target districts in Sindh province, addressing environmental access and equity concerns. By focusing on areas like Sujawal, Umerkot, and Tharparkar, the project aims to eliminate historical disparities in water access and availability.</p> <p>3. Marginalised and Vulnerable Groups</p>	<p>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</p>	<ul style="list-style-type: none"> • Strict enforcement of safety protocols during construction. • Provide adequate training for construction workers on health and safety practices.

Project Output and Activities under Category B	E&S Impacts Based on ESP Principals	E&S Impact Analysis	E&S Mitigation and Monitoring
<p>Sujawal, Umerkot, Sanghar, and Tharparkar districts of Sindh.</p> <p>Activity 5.2.2: Install automatic water quality monitoring systems to ensure real-time monitoring in the target catchment location.</p> <p>Activity 5.2.3: Construct/upgrade 15 communal ponds benefiting 30,000 people in the Umerkot, Sanghar, Sujawal and Tharparkar districts of Sindh.</p> <p>Activity 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.</p>	<p>The project's focus on vulnerable districts contributes to the upliftment of marginalised communities. By promoting climate adaptation through water conservation, the project aims to make these communities more resilient to climate change-induced shocks.</p> <p>4. Human Rights Enhancing water supply during drought and reducing the impact of climate-induced shocks directly contributes to the protection of human rights. The project strives to ensure a basic human right to water, promoting a healthy and sustainable living environment.</p> <p>5. Gender Equality and Women Empowerment The establishment of communal pond management committees and the involvement of communities in climate adaptation initiatives actively promote gender equality. Women's participation in managing water resources empowers them and ensures an inclusive approach to decision-making.</p> <p>6. Core Labour Rights In the construction and upgrade of communal ponds, the project upholds core labour rights. This includes ensuring fair and safe working conditions during the implementation phase, contributing positively to local labour markets.</p> <p>7. Indigenous Peoples While the project does not specifically target indigenous populations, assessments are conducted to identify potential impacts. Cultural sensitivity is maintained to avoid negative effects on indigenous communities if present in the project areas.</p> <p>8. Involuntary Resettlement The nature of the project, focusing on existing waterways and ponds, minimises the risk of involuntary resettlement. This approach safeguards community structures and livelihoods, preventing disruptions associated with large-scale infrastructure projects.</p> <p>9. Protection of Natural Habitat The restoration and rehabilitation activities prioritise the protection of natural habitats. The project incorporates measures to minimise disruption, ensuring the preservation of local ecosystems and the biodiversity within the targeted districts.</p>	<p>Construction Impact: Temporary habitat disruption during restoration activities. Potential soil erosion in construction areas.</p> <p>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.</p> <p>ECONOMIC IMPACTS Positive Impacts 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</p>	

Project Output and Activities under Category B	E&S Impacts Based on ESP Principals	E&S Impact Analysis	E&S Mitigation and Monitoring
	<p>10. Conservation of Biological Diversity The project actively contributes to the conservation of biological diversity by restoring natural waterways and ponds. The restoration work aims to maintain the ecological balance and preserve the richness of flora and fauna in the project areas.</p> <p>11. Climate Change The project's focus on promoting climate adaptation through water conservation directly addresses the impacts of climate change. By enhancing water supply during drought and reducing vulnerability, the project contributes to the broader resilience of communities to climate-induced shocks.</p> <p>12. Pollution Prevention and Resource Recovery The installation of automatic water quality monitoring systems contributes to pollution prevention. Real-time monitoring ensures that water quality is maintained, preventing pollution, and promoting responsible resource management.</p> <p>13. Public Health Improved water quality, monitored through automatic systems, directly impacts public health positively. Communities in the targeted districts can expect reduced health risks associated with waterborne diseases, enhancing overall well-being.</p> <p>14. Physical and Cultural Heritage While the project does not directly impact physical or cultural heritage, precautionary measures are implemented. These measures aim to prevent inadvertent damage during restoration and rehabilitation activities, preserving the historical and cultural elements of the project areas.</p> <p>15. Lands and Soil Conservation The project's activities include measures for lands and soil conservation. Erosion control and ecological considerations are implemented to minimise soil disturbance, ensuring the long-term health of local land resources.</p>	<p>community resilience to climate-related challenges. Negative Impacts Construction Costs: Initial high construction costs may strain the project budget.</p>	

PART III: IMPLEMENTATION ARRANGEMENTS

P. Project Management Arrangements at National Level

P.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, UN Women and NRSP. Stakeholders at the sub-national level were consulted. These consultations are outlined in Section L.

P.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 P.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.

P.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 project management team 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 Project management team will develop a Monitoring and Evaluation Plan during the project's inception phase, which will be distributed to target stakeholders.

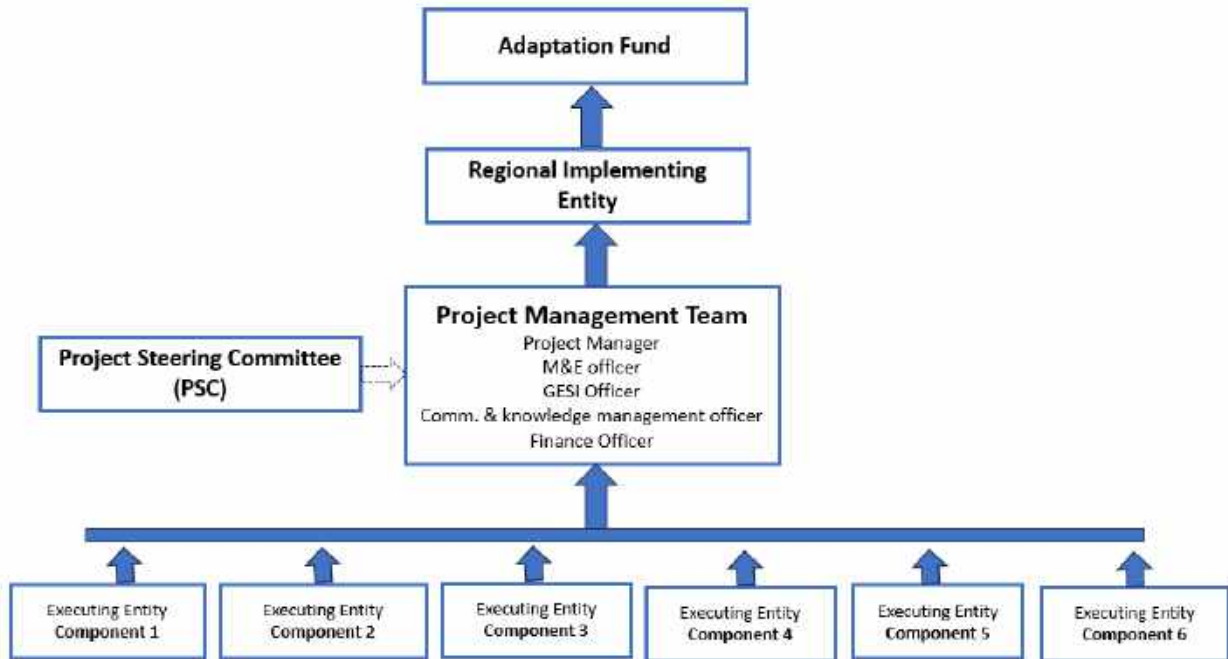
The PMT's major functions include:

- 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.

Figure 6: Project organogram



P.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 6. In this regard, the PSC will:

- 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 Glacial Lake Outburst Flood (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.

P.1.4. Legal and Financial Arrangements

ICIMOD and MoCC&EC will sign a joint Memorandum of Understanding as a legal commitment to implement the project. ICIMOD will work with xx different Executing Entities, signing one AoC to execute the respective components of the project.

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.

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).

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.

Financial risks will be monitored and assessed by the ICIMOD Finance Department on an on-going 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 hosted in Nepal.

P.2. Role and Responsibilities of the Executing Entities

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.

P.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 Annex 5.

P.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.

P.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.

P.5.1. M&E Tools

P.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.

P.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.

P.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.

P.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.

P.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.

Q. Financial and Project Risk Management Measures

Q.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.

Q.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 (DG):** The DG 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 DG 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 programme and the unit level of 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.

Q.3. Financial Risk Management

Major risks	Mitigation measures
Internal control risk	The internal control processes that have been developed for programme 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	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.
Financial management information for decision making	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	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.

Major risks	Mitigation measures
Fraud and corruption may hamper the institutional performance at any level	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.
Monitoring and evaluation processes and systems	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)	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	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	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 to US\$ 10,000 is carried out by obtaining at least three written competitive quotations from capable suppliers while the procurement with value more than \$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	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	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.

Q.4. Project Risk Management

Major Risks	Mitigation Measures
Fragmented partnerships: Past independent practices of government partners might impede establishing collaborative relationships, delaying effective cooperation.	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 UN Women.
Sustainability challenges: There's a risk of reverting to unsustainable practices by land users and local communities once the project concludes.	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 behavioural change at community level for long-term support systems to ensure continued adoption of sustainable practices post-project. (Section N)

Major Risks	Mitigation Measures
Limited awareness and preparedness: Communities and government staff may struggle to adopt new technologies and practices due to inadequate awareness and preparation.	A large part of activities focuses on community engagement programs, workshops, and hands-on training for new technologies and practices to enhance awareness and readiness.
Community conflicts: Conflicts between communities over disaster risk reduction approaches, water management, planning, and land use could emerge, impacting project objectives.	The project implementation will focus on fostering participatory decision-making, employing conflict resolution techniques, and promote shared understanding through community consultations.
Climate-related disruptions: Extreme weather events like floods could halt project implementation for up to six months, compounded by reduced government attention due to reprioritization towards disaster recovery.	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 jeopardize the safety of our staff, disrupting operations and hindering planned activities.	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.	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.

R. Environmental and Social Risk Management Measures

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 17) and Environmental and Social Management Plan (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 3.2, 4.2 and 5.2).

R.1. Environmental and Social Compliance Plan

As elaborated in Table 16, the project is mostly in compliance with the ESP. The E&S Compliance Plan (ESCP) presented in Table 17 further confirms the Project's commitment to comply with ESP.

Table 17: E&S Compliance Plan

Project Outputs under Category B	Measures to Avoid, Manage or Mitigate Risks
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.	<ul style="list-style-type: none"> • The ESCP for Output 3.2 of the adaptation fund is characterised by a meticulous strategy to integrate and uphold the 15 ESP principles of the Adaptation Fund. The core objective 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. • A firm commitment to compliance with local laws will be maintained, ensuring adherence to all relevant national and local environmental and social regulations, thus establishing a robust legal foundation for the project. • 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.

Project Outputs under Category B	Measures to Avoid, Manage or Mitigate Risks
	<ul style="list-style-type: none"> • 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. • The expected outcome will encapsulate a vision of resilient communities in flood-prone areas, benefiting from sustainable and climate-resilient water supply services. This vision will manifest through the construction of 100 solar-powered water facilities benefiting 150,000 people in specified districts of Sindh and KP provinces, along with the installation of 60 hand pumps and lead pipelines benefiting an additional 15,000 people. In essence, the ESCP for Output 3.2 will not only encapsulate a comprehensive adherence to environmental and social principles but also outline a transformative vision for communities, ensuring their well-being and resilience in the face of environmental challenges.
<p>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.</p>	<ul style="list-style-type: none"> • The output is focussed on installing eight constructed wetlands as nature-based solutions (NbS) for decentralised sewage treatment, ensuring that the upcoming project steadfastly adheres to the highest standards. • The commitment to compliance with local laws will set the groundwork for a robust legal foundation, while the future emphasis on equitable access will underscore a dedicated effort to ensuring that the benefits of the constructed wetlands extend comprehensively to marginalised and vulnerable communities. Future considerations will recognise and address the specific needs of these groups, fostering their active inclusion in decision-making processes. • The plan will uphold human rights, promote gender equality, and ensure core labour rights as integral components, reflecting a commitment to future social justice. • Respect for indigenous peoples' rights will involve meaningful consultations, strategically incorporating traditional knowledge seamlessly into the impending project. • The plan will take a comprehensive approach to minimise involuntary resettlement (if any) and protect natural habitats, aligning with the broader future goal of biodiversity conservation. • In addressing future climate change, resilient design features will be seamlessly integrated into sewage treatment, ensuring alignment with adaptive measures. • Future considerations for pollution prevention, public health, and the preservation of cultural heritage and lands will demonstrate a holistic understanding of the future impact of the project. • Future operational activities, including the construction of wetlands, governance structure strengthening, and support for service providers, will reveal a nuanced

Project Outputs under Category B	Measures to Avoid, Manage or Mitigate Risks
	<p>approach to ensure the success of the initiative. The anticipated outcome, benefiting 22,400 individuals across specified districts in the future, reflects a visionary goal of enhancing wash infrastructure adaptability and fostering climate-resilient communities. In essence, this initiative, poised for future implementation, transcends a mere sewage treatment project, embodying a future commitment to sustainability, social equity, and climate resilience, aligning seamlessly with the ESP principles of the Adaptation Fund.</p>
<p>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.</p>	<ul style="list-style-type: none"> • The primary focus will be on initiating the rehabilitation and restoration of 15 designated waterways and ponds in Sindh province, accompanied by the prospective installation of automatic water quality monitoring systems. The ESCP encompass the establishment and fortification of operational, maintenance, and management structures in preparation for future endeavours. • Rooted in a steadfast commitment to compliance with local laws, the forthcoming plan will prioritise equitable access, ensuring that marginalised communities are poised to benefit from these conservation efforts. • Future considerations will give specific attention to the needs of vulnerable groups, fostering their active involvement in the upcoming restoration endeavours. • The project will uphold human rights and promote gender equality as integral components, with a foresighted approach to core labour rights, ensuring fair conditions for individuals engaged in future restoration activities. • Respect for the rights of indigenous peoples will be paramount, with plans to seamlessly incorporate their traditional knowledge into the forthcoming rehabilitation processes. • Measures will be meticulously devised to avoid or minimise involuntary resettlement (if any) and protect natural habitats, aligning with the future objectives of biodiversity conservation. • The initiative, in its implementation, will integrate climate-resilient design features and prospective pollution prevention measures to proactively mitigate the impacts of climate change. Additionally, there will be a future emphasis on public health considerations and the preservation of cultural and physical heritage, promoting sustainable land use practices during the upcoming rehabilitation. • Implementation activities will involve the systematic restoration of waterways, the prospective installation of monitoring systems, upgrading of communal ponds, and the establishment of communal pond management committees as a pivotal pilot for future climate adaptation. The expected outcomes will involve the tangible restoration of 15 waterways and ponds, the prospective installation of monitoring systems, and the establishment of robust operational structures. Simultaneously, the initiative aims to significantly reduce the impact of future climate-induced shocks on targeted communities, facilitating a more rapid and effective recovery process. In essence, this forward-looking plan embodies a committed approach to sustainable surface water conservation and community resilience, aligning seamlessly with the overarching principles of the adaptation fund in future course of action.

R.2. 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. 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 practice from other AF supported projects and other agencies working in Pakistan, who implement projects in accordance with their internationally recognised E&S safeguards.

- **Responsibilities:** Direct responsibility for implementation of the project in accordance with this plan lies with the Project Manager 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.

- **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 Annex 5 of the proposal and measures are highlighted under ESP's Gender Equality and Women's Empowerment principle and GESI considerations integrated across the programme.
- **Budget:** Adequate budget (Section R.2) has been allocated for implementation of the ESMP and monitoring and reporting on the E&S compliance. 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 executing entities, 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.

R.3. E&S Monitoring and Evaluation Arrangements

- This monitoring arrangements, as outlined in Table 18 and Table 19 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 and summarised in Table 19.

Table 18: E&S safeguards monitoring overview.

Action	Indicator and Method	Responsibility and Frequency
Implementation of Grievance Redressal Mechanism	GRM information is shown in target areas (e.g., Local Government and District Offices) and on ICIMOD project website	Project Manager – within half a year from inception
Consent Process (communities)	Consent sheets are signed by community members/ stakeholders before the project begins any physical works	Project Manager and Executing Entities – before inception of physical works
Permission (government)	Full written permission from each government agency obtained before any construction activity begins	Project Manager, relevant local government agency

Table 19: E&S compliance and management monitoring

Project Outputs	ESP Principle	Measures to Avoid or Mitigate Risks / Impacts	M&E Indicator and Methods	M&E Responsibility
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.	Core Labour Rights	Partner with contractors adhering to international labour standards, conduct regular training on workers' rights and establish GRM for workers.	<p>Indicator: Compliance with international labour standards Method: Regular audits and reviews of labour practices, contracts, and working conditions.</p> <p>Indicator: GRM effectiveness Method: Regular assessments of the GRM's accessibility, responsiveness, and resolution effectiveness.</p> <p>Indicator: Worker training and awareness Method: Periodic assessments of the training programs on labour rights provided to workers.</p>	Project Management Team
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.	Involuntary Resettlement	Conduct thorough social impact assessments, consult affected communities, and develop a Resettlement Action Plan (RAP) if necessary.	<p>Indicator: Adherence to Resettlement Action Plan (RAP) Method: Regular assessments and audits to ensure compliance with the approved RAP.</p> <p>Indicator: Community satisfaction and well-being Method: Conduct periodic surveys, interviews, or focus group discussions with affected communities.</p> <p>Indicator: GRM effectiveness for resettlement issues Method: Assess the effectiveness of the GRM specifically for resettlement-related concerns.</p>	Project Management Team
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.	Protection of Natural Habitats	Implement buffer zones, conduct biodiversity assessments, and develop habitat restoration plans.	<p>Indicator: Adherence to buffer zone requirements Method: Regular site inspections and satellite imagery analysis to ensure compliance with buffer zone specifications.</p> <p>Indicator: Habitat assessment Method: Periodic habitat assessments by qualified experts.</p>	Project Management Team
	Conservation of Biodiversity	Implement biodiversity offset programs, protect critical habitats, and use sustainable construction practices.	<p>Indicator: Adherence to buffer zone requirements Method: Regular site inspections and satellite imagery analysis to ensure compliance with buffer zone specifications.</p> <p>Indicator: Biodiversity assessment Method: Periodic biodiversity assessments by qualified experts.</p>	Project Management Team

Project Outputs	ESP Principle	Measures to Avoid or Mitigate Risks / Impacts	M&E Indicator and Methods	M&E Responsibility
	Land and Soil Conservation	Implement erosion control measures, re-vegetate disturbed areas, and promote sustainable land management practices.	<p>Indicator: Soil erosion rates Method: Regular soil erosion assessments through field surveys and remote sensing.</p> <p>Indicator: Implementation of erosion control measures Method: Monthly site inspections to assess the installation and effectiveness of erosion control measures.</p> <p>Indicator: Adoption of sustainable land management practices Method: Quarterly assessments of land management practices through field surveys and interviews.</p>	Project Management Team
	Climate Change	Incorporate climate-resilient design, conduct vulnerability assessments, and develop adaptive strategies for changing climate conditions.	<p>Indicator: Climate-resilient infrastructure performance Method: Regular assessments of the infrastructure's ability to withstand and adapt to climate-related stresses (e.g., extreme weather events, changing precipitation patterns).</p> <p>Indicator: Community climate resilience Method: Biannual surveys and interviews with community members to assess their awareness, preparedness, and adaptation practices related to climate change.</p>	Project Management Team

S. Monitoring and Evaluation Arrangements and Budget

S.1. M&E Oversight and Monitoring Responsibilities

S.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.

S.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 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.

S.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.

S.2. M&E Requirements and Budget

Table 20 presents the M&E requirement across the project lifespan, responsibilities, and budget for undertaking various M&E activities.

Table 20: M&E requirements 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 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.	Project Manager	50,000	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.			
Inception	Inception Workshop	Project Manager	50,000	
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.	Project Manager	200,000	On-going

M&E Requirements	Description	Responsibility	Budget (US\$)	Timeframe
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 communities. The aim is to proactively address and manage E&S risks, fostering sustainable and responsible practices throughout the project's lifecycle.	Project Manager	200,000	On-going
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.	Project Manager	200,000	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	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.	Project Manager	50,000	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 through a gender lens to identify any disparities, inequalities, or opportunities for promoting gender equality.	Project Manager	55,000	Mid-term and at the end of the project.
	Key elements of the Gender Assessment will include examining the distribution of		-	

M&E Requirements	Description	Responsibility	Budget (US\$)	Timeframe
	<p>project benefits among different genders, assessing the inclusivity of project interventions, and identifying gender-specific challenges or advantages. This will ensure that the project is 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 throughout the project lifecycle.</p>			
	<p>The gender assessment will be conducted as part of the mid-term and end-term project review.</p>	Project Manager		
Mid-Term External Evaluation and Midterm Meeting	External Evaluation of the Project activities	Sr. Evaluation Officer, ICIMOD	100,000	
	<p>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.</p>	Project Manager and ICIMOD MEL Team	100,000	Project Mid-term
	<p>During the Mid-Term Review, independent evaluators will assess the project's relevance, efficiency, and effectiveness, 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.</p>		-	
	<p>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.</p>		-	
	<p>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</p>		-	

M&E Requirements	Description	Responsibility	Budget (US\$)	Timeframe
	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.			
	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.		-	
	The MTR report will be disseminated to relevant stakeholders through various communication channels including physical and online events.		-	
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.	Sr. Evaluation Officer, ICIMOD	125,000	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.		-	
	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.		-	
	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 the		-	

M&E Requirements	Description	Responsibility	Budget (US\$)	Timeframe
	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.		-	
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.	Project Manager and ICIMOD MEL Team	70,000	Due within one month after the end of project implementation.
Final Dissemination Workshop	The Final Project Closing Dissemination Workshop	Project Manager	100,000	

T. 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.	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> 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.	<ul style="list-style-type: none"> Percentage increase in people reporting reduced vulnerability to climate-induced cryosphere multi-hazard risk due to forewarning. 	<ul style="list-style-type: none"> Project baseline, midline and endline reports 		
Output 1.1: Integrated cryosphere risk mapping through community engagement.	<ul style="list-style-type: none"> Percentage of target communities with risk mapping and zoning documents. 	<ul style="list-style-type: none"> Project monitoring report 	0%	Mid-term: 60% Final: 100%
Output 1.2: Community-based monitoring and early warning systems established.	<ul style="list-style-type: none"> Percentage of targeted communities with established CB-MEWS monitoring systems. 	<ul style="list-style-type: none"> Project monitoring report 		Mid-term: 50% Final: 100%
Output 1.3: Strengthened resilience to cryosphere-related risks.	<ul style="list-style-type: none"> Targeted communities with disaster response SOPs and CB-MEWS that consider gender-specific risks and procedures. 	<ul style="list-style-type: none"> Project monitoring report 		Mid-term: All
Outcome 2: Increased access to spring water in climate adaptive and gender inclusive manner.	<ul style="list-style-type: none"> Percentage increase in gender-disaggregated access to safe water from springs. 	<ul style="list-style-type: none"> Project baseline, midline and endline reports 		
Output 2.1: A comprehensive web-based information management system of spring-sheds and springs prepared for Malakand and Hazara divisions.	<ul style="list-style-type: none"> Comprehensive web-based database of spring-sheds and springs in the project areas. 	<ul style="list-style-type: none"> Project monitoring report 	None	Mid-term: Database developed

Intended Results	Indicators / Measures	Means of Verification	Baseline Values	Mid-term and Final Targets
Output 2.2: Recharge measures (for improved spring-shed practices, land use planning, and bioengineering) co-developed and implemented.	<ul style="list-style-type: none"> Percentage increase in quantity and quality of water from identified springs. 	<ul style="list-style-type: none"> Project monitoring report 		
Output 2.3: Local governance framework for spring-shed established with enhanced institutional capacity for efficient water resource management.	<ul style="list-style-type: none"> Percentage of target communities with a local governance framework for springshed management. Number of institutional capacity building interventions carried out in targeted communities. 	<ul style="list-style-type: none"> 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.	<ul style="list-style-type: none"> Community institutions in place and strengthened for groundwater management. of people benefiting from access to safe ground water supply sources in target areas. 	<ul style="list-style-type: none"> 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.	<ul style="list-style-type: none"> Comprehensive web-based database of groundwater resource in the project areas. Percentage of identified water recharge facilities completed. 	<ul style="list-style-type: none"> 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.	<ul style="list-style-type: none"> Number of households with access to climate-resilient and sustainably managed water supply services. 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. Number of solar-powered water facilities constructed/upgraded. Number of climate-resilient handpumps installed 	<ul style="list-style-type: none"> Project monitoring report Project baseline, midline and endline reports 	None	Mid-term: 40% Final: 100% Final: 100 facilities Final: 60 handpumps
Outcome 4: WASH infrastructure in the targeted communities in the Middle Indus Basin is more	<ul style="list-style-type: none"> Percentage increase in the volume of wastewater treated through nature-based solutions (NbS). 	<ul style="list-style-type: none"> Project baseline, midline and endline reports Project monitoring report 		

Intended Results	Indicators / Measures	Means of Verification	Baseline Values	Mid-term and Final Targets
adaptive to climate change induced shocks with up scaling of the contextually appropriate NbS solutions.				
Output 4.1: Targeted intervention sites identified for evidence based, climate adaptive and focused WASH interventions.	<ul style="list-style-type: none"> Number of intervention sites identified and assessed. 	<ul style="list-style-type: none"> 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.	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> 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.	<ul style="list-style-type: none"> Percentage increase in targeted surface water bodies with improved water quality parameters. Percentage increase in storage capacity of surface water in the project areas. 	<ul style="list-style-type: none"> 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.	<ul style="list-style-type: none"> Study report on natural waterways and community ponds 	<ul style="list-style-type: none"> 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.	<ul style="list-style-type: none"> Number of fully managed climate resilient water storage structures in the project areas. 	<ul style="list-style-type: none"> Project baseline, midline and endline reports 	None	Final: 15 waterways/ponds
Outcome 6: Improved knowledge and practices of communities and policymakers on climate change	<ul style="list-style-type: none"> Percentage increase in number of community members aware of climate risks. 	<ul style="list-style-type: none"> Project baseline, midline and endline reports KAP survey report 		

Intended Results	Indicators / Measures	Means of Verification	Baseline Values	Mid-term and Final Targets
adaptation and climate risk reduction.	<ul style="list-style-type: none"> • 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. 			
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.	<ul style="list-style-type: none"> • Number of relevant, local institutions that receive technical training in innovative social and technological tools for climate change adaptation. 	<ul style="list-style-type: none"> • Project monitoring report 		
Output 6.2: An extensive knowledge repository on climate change and WASH practices developed and used.	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • Project monitoring report 		
Output 6.3: Community-led adaptation solutions widely adopted through awareness-raising and behavioural change.	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Project baseline, midline and endline reports 		

INPUTS:

- 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 sites to strengthen their resilience to climate change-induced disasters.
- Activity 1.2.1. Establish Community Watch Groups to undertake necessary preparedness actions and measures.
- Activity 1.2.2. Prepare a participatory community monitoring plan, including the need for contextually appropriate technological measures that supplement community members' monitoring.
- Activity 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.
- 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.
- Activity 1.2.6. Establish networking and communication channels to disseminate early warning information in a larger network to provide lead time for preparedness.
- Activity 1.2.7. Combine CB-MEWS with real-time satellite data for timely risk identification and communication.
- Activity 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.
- 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.
- Activity 1.3.1. Engage local leaders and policymakers to incorporate cryosphere-related risk in flood zonation and infrastructure planning.
- 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.
- Activity 2.1.1. Compile Springs Inventory and a web-based information system (GPS location, biophysical characters, gender-social and economic information)
- 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.
- Activity 2.1.3. Prepare participatory hydrogeological maps: (1) Study of rocks, rock structures, and streams; (2) Geological cross-sections.
- 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.
Activity 2.3.1.	Document cost-benefit analysis and impact assessment.
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 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.
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 6 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.
Activity 3.1.4.	Install water quality meters will 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 (LGAs), along with technical backstopping with the collaboration of academia.
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 Charsada, Swat and Nowshera districts of KP province.
Activity 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.
Activity 3.2.4.	Establish/strengthen community water management structures, including training WASH committees and local technicians.
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.
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 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).
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 BOQs for 15 community pond sites, including site plans.
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 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.
- Activity 6.1.1. Conduct gap analysis of groundwater legislation at the provincial and federal levels and recommend and support implementing tangible actions for drafting new groundwater acts in KP and Sindh provinces.
- 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 stakeholders in Sindh and KP provinces, especially the government departments from different provincial/area governments, through KM products.
- Activity 6.1.8. Facilitate improved knowledge and practices of policy makers on WASH and climate change.
- Activity 6.2.1. Integrate the CGPCP data into the Living Indus Knowledge Platform: Crowdsourcing Knowledge Platform.
- Activity 6.2.2. Organise a workshop to validate the indicators for contextual appropriateness, focusing on Sindh, KP and GB.
- Activity 6.2.3. Undertake district-level training sessions in 15 districts of the proposed programme in Sindh, KP and GB provinces to train the district government staff in data collection and data entry in CGPI web portals.
- Activity 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 programme, i.e., Water, Sanitation, Hygiene, Liquid and Solid Waste Management and Plantation
- Activity 6.2.5. Provide technical support to the MoCC&EC to review the climate adaptation data against indicators being reported by districts.
- Activity 6.2.6. Expand the Clean Green Pakistan Champions Programme (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.
- Activity 6.2.7. Support the initial production of three six-month database analyses and dissemination to decision-makers and stakeholders at the national and provincial levels as part of the Living Indus Initiative monitoring mechanism.
- Activity 6.2.8. Create a comprehensive database of all climate adaptive NbS and EbAs technologies used in the Indus Basin, their cost, efficacy, and contextual prerequisites.
- Activity 6.2.9. Development of National Indus Water Atlas web portal with GIS modelling and geotagging.
- Activity 6.2.10. 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 6.2.11. Support production and dissemination of KM products, including One Catalogue of appropriate technologies and NbS for different Indus River basin geographical zones, four technical papers on specific activities of the programme for replication elsewhere, One Catalogue of water sector stakeholders from the private sector, academia and research organisations, development, and donors, CSOs and CBOs, and government/semi-government organisations with geographical presence and capacities for partnership in the Indus basin and six success stories/case studies.
- Activity 6.3.1. Build Public-Private Partnerships (PPPs) across the basin with private sector actors in the sanitation, construction, and finance sectors.
- Activity 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.

- Activity 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.
- Activity 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.
- Activity 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.
- Activity 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.
- Activity 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.
- Activity 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.

Estimated Budget: US\$ 10,000,000

U. Demonstrate how the project aligns 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 21) and the Fund Outputs (Table 22).

Table 21: Alignment of project results with the Fund outcomes

Project Objectives1	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 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.	<ul style="list-style-type: none"> 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. 	1: Reduced exposure to climate-related hazards and threats.	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	10,000,000
		7: Improved policies and regulations that promote and enforce resilience measures.	7.1. No. of policies introduced or adjusted to address climate change risks (by sector)	
		8: Support the development and diffusion of innovative adaptation practices, tools, and technologies.	8.1. No. of innovative adaptation practices, tools and technologies accelerated, scaled up and/or replicated	
Component 1: Cryosphere DRR 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.	1: Reduced exposure to climate-related hazards and threats.	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	1,873,545
2: Strengthened institutional capacity to reduce risks associated with climate-induced		2.1.1. No. of staff trained to respond to, and mitigate impacts of, climate-related events (by gender)		

Project Objectives 1	Project Objective Indicator(s)	Fund Outcome	Fund Outcome Indicator	Grant Amount (US\$)
		socioeconomic and environmental losses.	2.1.2 No. of targeted institutions with increased capacity to minimize exposure to climate variability risks (by type, sector, and scale)	
Component 2: Springshed Revival and Management 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.	1: Reduced exposure to climate-related hazards and threats.	1. Relevant threat and hazard information generated and disseminated to stakeholders on a timely basis	1,021,635
		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 the local level.	3.1. Percentage of targeted population aware of predicted adverse impacts of climate change, and of appropriate responses	
		5: Increased ecosystem resilience in response to climate change and variability-induced stress.	5. Ecosystem services and natural resource assets maintained or improved under climate change and variability-induced stress	
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.	<ul style="list-style-type: none"> Percentage increase in availability of groundwater. Percentage increase in women beneficiaries of increased access to groundwater. 	1: Reduced exposure to climate-related hazards and threats.	1. Relevant threat and hazard information generated and disseminated to stakeholders on a timely basis	2,527,260
		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 the local level.	3.1. Percentage of targeted population aware of predicted adverse impacts of climate change, and of appropriate responses	
		4: Increased adaptive capacity within relevant development	4.1.2. No. of physical assets strengthened or constructed to withstand conditions resulting from	

Project Objectives1	Project Objective Indicator(s)	Fund Outcome	Fund Outcome Indicator	Grant Amount (US\$)
		sector services and infrastructure assets	climate variability and change (by sector and scale)	
<p>Component 4: Ecosystem-based Solutions</p> <p>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 solutions.</p>	<p>Percentage increase in the volume of wastewater treated through nature-based solutions (NbS).</p>	1: Reduced exposure to climate-related hazards and threats.	1. Relevant threat and hazard information generated and disseminated to stakeholders on a timely basis	766,500
		3: Strengthened awareness and ownership of adaptation and climate risk reduction processes at the local level.	3.1. Percentage of targeted population aware of predicted adverse impacts of climate change, and of appropriate responses	
		4: Increased adaptive capacity within relevant development sector services and infrastructure assets.	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. Ecosystem services and natural resource assets maintained or improved under climate change and variability-induced stress	
<p>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.</p>	<ul style="list-style-type: none"> Percentage increase in targeted surface water bodies with improved water quality parameters. Percentage increase in storage capacity of surface water in the project areas. 	1: Reduced exposure to climate-related hazards and threats.	1. Relevant threat and hazard information generated and disseminated to stakeholders on a timely basis	1,186,955
		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 the local level.	3.1. Percentage of targeted population aware of predicted adverse impacts of climate change, and of appropriate responses	
		4: Increased adaptive capacity within relevant development sector services and infrastructure assets.	4.1.2. No. of physical assets strengthened or constructed to withstand conditions resulting from climate variability and change (by sector and scale)	

Project Objectives ¹	Project Objective Indicator(s)	Fund Outcome	Fund Outcome Indicator	Grant Amount (US\$)
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.	<ul style="list-style-type: none"> 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. A robust supportive ecosystem with required policies, strategies or regulations related to climate adaptation and water resource management at the provincial and national levels. 	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	1,840,693
		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	
		7: Improved policies and regulations that promote and enforce resilience measures.	7. Climate change priorities are integrated into national development strategy	
		8: Support the development and diffusion of innovative adaptation practices, tools, and technologies.	8. Innovative adaptation practices are rolled out, scaled up, encouraged and/or accelerated at regional, national and/or subnational level.	

Table 22: Alignment of project results with the Fund outputs

Project Outcome(s)	Project Outcome Indicator(s)	Fund Output	Fund Output Indicator	Grant Amount (US\$)
Output 1.1: Integrated cryosphere risk mapping through community engagement.	Percentage of target communities with risk mapping and zoning documents.	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)	465,375
Output 1.2: Community-based monitoring and early warning systems established.	Percentage of targeted communities with established CB-MEWS monitoring systems.		1.2 No. of early warning systems (by scale) and no. of beneficiaries covered	942,795
Output 1.3: Strengthened resilience to cryosphere-related risks.	Targeted communities with disaster response SOPs and CB-MEWS that consider gender-specific risks and procedures.	Output 2.1: Strengthened capacity of national and sub-national centres and networks to respond rapidly to extreme weather events.	2.1.1. No. of staff trained to respond to, and mitigate impacts of, climate-related events (by gender) 2.1.2 No. of targeted institutions with increased capacity to minimize	465,375

Project Outcome(s)	Project Outcome Indicator(s)	Fund Output	Fund Output Indicator	Grant Amount (US\$)
			exposure to climate variability risks (by type, sector, and scale)	
Output 2.1: A comprehensive web-based information management system of spring-sheds and springs prepared for Malakand and Hazara divisions.	Comprehensive web-based database of spring-sheds and springs in the project areas.	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)	292,365
Output 2.2: Recharge measures (for improved spring-shed practices, land use planning, and bioengineering) co-developed and implemented.	Percentage increase in quantity of water from identified springs.			520,125
Output 2.3: Local governance framework for spring-shed established with enhanced institutional capacity for efficient water resource management.	Percentage of target communities with a local governance framework for springshed management. Institutional capacity building interventions carried out in targeted communities.	Output 5: Vulnerable ecosystem services and natural resource assets strengthened in response to climate change impacts, including variability	3.2.2 No. of tools and guidelines developed (thematic, sectoral, institutional) and shared with relevant stakeholders. 5.1. No. of natural resource assets created, maintained, or improved to withstand conditions resulting from climate variability and change (by type and scale)	209,145
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. Percentage of identified water recharge facilities completed.	Output 1.1: Risk and vulnerability assessments conducted and updated. Output 2.1: Strengthened capacity of national and sub-national centres and networks to respond rapidly to extreme weather events. Output 3.2: Strengthened capacity of national and subnational stakeholders and entities to capture and	1.1. No. of projects/programmes that conduct and update risk and vulnerability assessments (by sector and scale) 2.1.1. No. of staff trained to respond to, and mitigate impacts of, climate-related events (by gender) 3.2.2 No. of tools and guidelines developed (thematic, sectoral, institutional) and shared with relevant stakeholders.	376,680

Project Outcome(s)	Project Outcome Indicator(s)	Fund Output	Fund Output Indicator	Grant Amount (US\$)
		disseminate knowledge and learning		
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.	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. Number of climate-resilient handpumps installed	Output 4: Vulnerable development sector services and infrastructure assets strengthened in response to climate change impacts, including variability. Output 7: Improved integration of climate-resilience strategies into country development plans	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. 7.1. No. of policies introduced or adjusted to address climate change risks (by sector)	2,150,580
Output 4.1: Targeted intervention sites identified for evidence based, climate adaptive and focused WASH interventions.	Number of intervention sites identified and assessed.	Output 1.1: Risk and vulnerability assessments conducted and updated. Output 3.2: Strengthened capacity of national and subnational stakeholders and entities to capture and disseminate knowledge and learning	1.1. No. of projects/programmes that conduct and update risk and vulnerability assessments (by sector and scale) 3.2.2 No. of tools and guidelines developed (thematic, sectoral, institutional) and shared with relevant stakeholders	54,750
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. Number of women participating in management of constructed wetlands.	Output 4: Vulnerable development sector services and infrastructure assets strengthened in response to climate change impacts, including variability. Output 5: Vulnerable ecosystem services and natural resource assets strengthened in response to climate change impacts, including variability	4.2. Physical infrastructure improved to withstand climate change and variability-induced stress. 5.1. No. of natural resource assets created, maintained, or improved to withstand conditions resulting from climate variability and change (by type and scale)	711,750
Output 5.1: Government of Sindh supported in systematically prioritising 15 natural waterways and community water	Study report on natural waterways and community ponds	Output 1.1: Risk and vulnerability assessments conducted and updated. Output 2.1: Strengthened capacity of national and sub-	1.1. No. of projects/programmes that conduct and update risk and vulnerability assessments (by sector and scale)	40,515

Project Outcome(s)	Project Outcome Indicator(s)	Fund Output	Fund Output Indicator	Grant Amount (US\$)
ponds to address water storage and wastage issues.		national centres and networks to respond rapidly to extreme weather events	2.1.1. No. of staff trained to respond to, and mitigate impacts of, climate-related events (by gender) 2.1.2 No. of targeted institutions with increased capacity to minimize exposure to climate variability risks (by type, sector, and scale)	
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.	Output 4: Vulnerable development sector services and infrastructure assets strengthened in response to climate change impacts, including variability	4.2. Physical infrastructure improved to withstand climate change and variability-induced stress	1,146,440
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 relevant, local institutions that receive technical training in innovative social and technological tools for climate change adaptation.	Output 2.1: Strengthened capacity of national and sub-national centres and networks to respond rapidly to extreme weather events	2.1.1. No. of staff trained to respond to, and mitigate impacts of, climate-related events (by gender) 2.1.2 No. of targeted institutions with increased capacity to minimize exposure to climate variability risks (by type, sector, and scale)	383,250
Output 6.2: An extensive knowledge repository on climate change and WASH practices developed.	Number of knowledge products (technical papers, case studies and human-interest stories) produced relating to climate change and WASH.	Output 3.1: Targeted population groups participating in adaptation and risk reduction awareness activities. Output 3.2: Strengthened capacity of national and	3.1.1 No. of news outlets in the local press and media that have covered the topic. 3.2.1 No. of technical committees/associations formed to ensure transfer of knowledge.	657,000

Project Outcome(s)	Project Outcome Indicator(s)	Fund Output	Fund Output Indicator	Grant Amount (US\$)
		subnational stakeholders and entities to capture and disseminate knowledge and learning	3.2.2 No. of tools and guidelines developed (thematic, sectoral, institutional) and shared with relevant stakeholders	
Output 6.3: Community-led adaptation solutions widely adopted through awareness-raising and behavioural change.	Number of community members participating in awareness building and behaviour change campaigns to promote the uptake of new adaptation solutions.	Output 7: Improved integration of climate-resilience strategies into country development plans Output 8: Viable innovations are rolled out, scaled up, encouraged and/or accelerated	7.1. No. of policies introduced or adjusted to address climate change risks (by sector) 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	800,443

V. Detailed Budget

Project Components	Expected Concrete Outputs	Expected Outcomes	Amount in USD
1. Cryosphere Disaster Risk Reduction	1.1. Integrated cryosphere risk mapping through community engagement.	Reduced climate-induced cryosphere multi-hazard risk.	465,375
	1.2. Community-based monitoring and early warning systems established.		942,795
	1.3. Strengthened resilience to cryosphere-related risks.		465,375
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.	292,365
	2.2. Recharge measures (for improved spring-shed practices, land use planning, and bioengineering) co-developed and implemented.		520,125
	2.3. Local governance framework for springshed established with enhanced institutional capacity for efficient water resource management.		209,145
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.	376,680
	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.		2,150,580
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 solutions.	54,750
	4.2. NbS for sewage treatment demonstrated through constructed wetlands along with proper management structures and adequate capacity for operation and maintenance of wetlands.		711,750
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.	40,515
	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.		1,146,440
6. Adaptive capacities and empowered communities for	6.1. National and provincial capacities strengthened to apply innovative social and	Improved knowledge and practices of	383,250

Project Components	Expected Concrete Outputs	Expected Outcomes	Amount in USD
strengthened resilience to climate change	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.	communities and policymakers on climate change adaptation and climate risk reduction.	
	6.2. An extensive knowledge repository on climate change and WASH practices developed.		657,000
	6.3. Community-led adaptation solutions widely adopted through awareness-raising and behavioural change.		800,443
Project Components Cost			9,216,588
Project Cycle Management Fee charged by IE (8.5% of Total Direct Cost)			783,412
Amount of Financing Requested			10,000,000

W. Disbursement Schedule

Project period: 1 May 2024 to 31 October 2027

	Upon signature of Agreement	One Year after Project Start a)	Year 2b)	Year 3	Year 4 c)	Total
Scheduled date	1 May 2024	1 Apr-2025	1 Apr 2026	30 Nov 2026	1 Apr 2027	NA
Project Funds	1,382,488	2,304,147	2,304,147	2,304,147	921,659	9,216,588
Implementing Entity Fees	117,512	195,853	195,853	195,853	78,341	783,412
Total	1,500,000	2,500,000	2,500,000	2,500,000	1,000,000	10,000,000

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

X. Record of endorsement on behalf of the government

Mr. Muhammad Farooq Senior Joint Secretary Ministry of Climate Change & Environmental Coordination Government of Pakistan	28 th February 2023
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**GOVERNMENT OF PAKISTAN
MINISTRY OF CLIMATE CHANGE**

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

Islamabad, the 28th February, 2023

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

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

2. Accordingly, the concept is endorsed for submission to Adaptation Fund. If approved, the project will be implemented by the International Centre for Integrated Mountain Development and executed by the National Rural Support Programme of Pakistan, and the United Nations Children's Fund (UNICEF) Pakistan.

Adaptation Fund Board
Secretariat


(Muhammad Farooq)
Sr. Joint Secretary (Dev)

CC:
Dr. Saima Shafique, Director, MoCC, Islamabad

Y. 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/programme 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/programme.

Name & Signature



Izabella Koziell

Deputy Director General
International Centre for Integrated Mountain Development

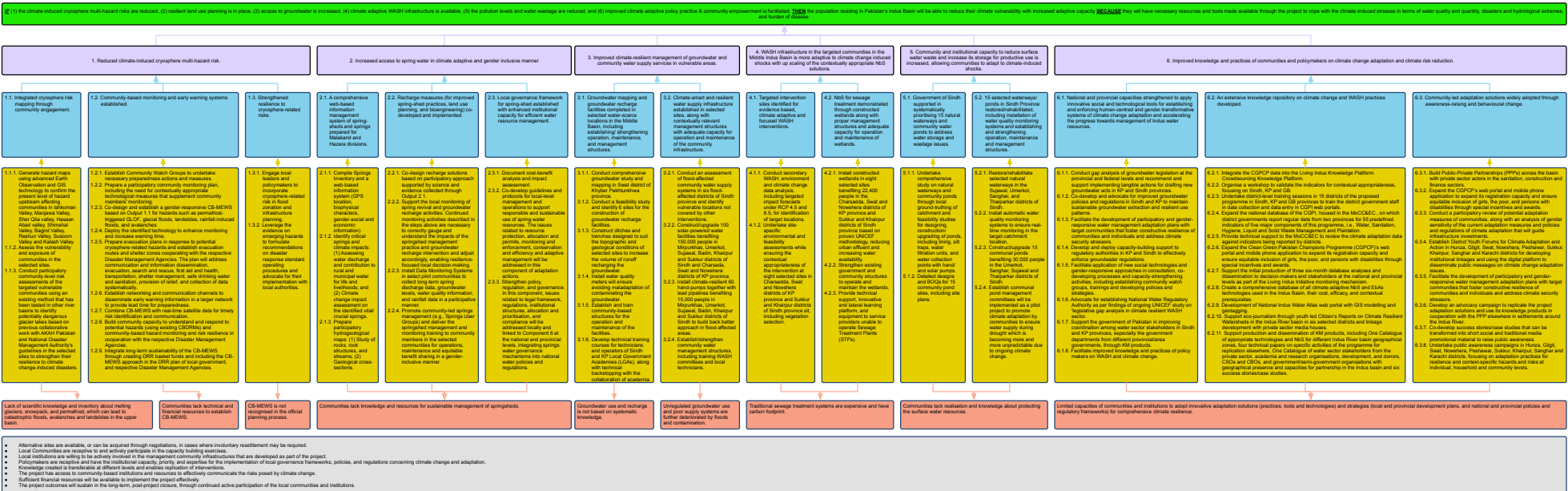
Date: 20th December 2023

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

Annex 1: Theory of Change



Notes: AKAFI = Aqua Khan Agency for Habitat; BODs = list of barrages; CBGs = community-based organizations; CDRMs = community-based disaster risk management; CB-MEWS = community-based monitoring and early warning system; CCOPCP = Clean Green Pakistan Champions Programme; COPF = Clean Green Pakistan Initiative; CSOs = community support organizations; DRR = disaster risk reduction; EDAs = 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

Annex 2: Indicative work plan for the project

Component/ Outcome	Output	Activity	2024		2025				2026				2027					
			Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4		
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																

Component/ Outcome	Output	Activity	2024		2025				2026				2027				
			Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
		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.															
		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	Output 2.1: A comprehensive web-based information management system of spring-sheds and springs prepared for	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;														

Component/ Outcome	Output	Activity	2024		2025				2026				2027				
			Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
climate adaptive and gender inclusive manner.	Malakand and Hazara divisions.	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.															
	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.															

Component/ Outcome	Output	Activity	2024		2025		2026				2027							
			Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4		
		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 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 (LGAs), 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	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																

Component/ Outcome	Output	Activity	2024		2025				2026				2027				
			Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
	management structures with adequate capacity for operation and maintenance of the community infrastructure.	districts of Sindh and Charsada, 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.															
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 solutions.	Output 4.1: Targeted intervention sites identified for evidence based, climate adaptive and focused WASH interventions.	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.															
		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).															
Outcome 5: Community and institutional capacity	Output 5.1: Government of Sindh supported in	5.1.1: Undertake comprehensive study on natural waterways and community ponds through local ground-truthing of catchment and feasibility															

Component/ Outcome	Output	Activity	2024		2025				2026				2027				
			Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
to reduce surface water waste and increase its storage for productive use is increased, allowing communities to adapt to climate-induced shocks.	systematically prioritising 15 natural waterways and community water ponds to address water storage and wastage issues.	studies for designing, construction/upgrading of ponds, including lining, silt traps, water filtration units, and water collection points with hand/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 strengthening operation, maintenance, and management structures.	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.															
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	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	6.1.1: Conduct gap analysis of groundwater legislation at the provincial and federal levels and recommend and support implementing tangible actions for drafting new groundwater acts in KP and Sindh provinces.															
		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.															
		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.															

Component/ Outcome	Output	Activity	2024		2025				2026				2027				
			Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
climate risk reduction.	progress towards management of Indus water resources.	6.1.4: Develop and deploy capacity-building support to regulatory authorities in GB, KP and Sindh to effectively enforce groundwater regulations.															
		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.															
		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.															
		6.1.7: Support the government of Pakistan in improving coordination among water sector stakeholders in Sindh and KP provinces, especially the government departments from different provincial/area governments, through KM products.															
		6.1.8: Facilitate improved knowledge and practices of policy makers on WASH and climate change.															
	Output 6.2: An extensive knowledge repository on climate change and WASH practices developed.	6.2.1: Integrate the CGPCP data into the Living Indus Knowledge Platform: Crowdsourcing Knowledge Platform.															
		6.2.2: Organise a workshop to validate the indicators for contextual appropriateness, focusing on Sindh, KP and GB.															
		6.2.3: Undertake district-level training sessions in 15 districts of the proposed programme in Sindh, KP and GB provinces to train the district government staff in data collection and data entry in CGPI web portals.															
		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															

Component/ Outcome	Output	Activity	2024		2025				2026				2027			
			Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
		major components of this programme, i.e., Water, Sanitation, Hygiene, Liquid and Solid Waste Management and Plantation.														
		6.2.5: Provide technical support to the MoCC&EC to review the climate adaptation data against indicators being reported by districts.														
		6.2.6: Expand the Clean Green Pakistan Champions Programme (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.														
		6.2.7: Support the initial production of three six-month database analyses and dissemination to decision-makers and stakeholders at the national and provincial levels as part of the Living Indus Initiative monitoring mechanism.														
		6.2.8: Create a comprehensive database of all climate adaptive NbS and EbAs technologies used in the Indus Basin, their cost, efficacy, and contextual prerequisites.														
		6.2.9: Development of National Indus Water Atlas web portal with GIS modelling and geotagging.														
		6.2.10: 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.														
		6.2.11: Support production and dissemination of KM products, including One Catalogue of appropriate technologies and NbS for different Indus River basin geographical zones, four technical papers on specific activities of the programme for replication elsewhere, One Catalogue of water sector stakeholders from the private sector, academia and research organisations, development, and donors, CSOs and CBOs, and government/semi-government														

Component/ Outcome	Output	Activity	2024		2025				2026				2027				
			Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
		organisations with geographical presence and capacities for partnership in the Indus basin and six success stories/case studies.															
	Output 6.3: Community-led adaptation solutions widely adopted through awareness-raising and behavioural change.	6.3.1: Build Public-Private Partnerships (PPPs) across the basin with private sector actors in the sanitation, construction, and finance sectors.															
		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.															
		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.															
		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.															
		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.															
		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.															
		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.															

Component/ Outcome	Output	Activity	2024		2025				2026				2027			
			Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
		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 Management Plan

The E&S Management Plan (ESMP) describes the management process that will be put in place to ensure that the project is 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, Table 23 presents the output specific measures to be put in place to avoid or reduce potential environmental and social risks.

Table 23: E&S Management Plan

Project Outputs	E&S Parameters / Impacts	Targets to be Achieved	Mitigation / Preventive Action	Responsibilities		
				Implementation	Supervision	Monitoring
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.	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	<ul style="list-style-type: none"> Compliance with prescribed local/provincial environmental quality standards such as to control air pollution 	<ul style="list-style-type: none"> 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. 	<p>During construction phase by the Contractor/EE/community in coordination with Project staff</p> <p>During O&M phase by the community</p>	Project Manager	E&S Focal Person Relevant EPA
Output 4.2: NbS for sewage treatment demonstrated through constructed wetlands along with proper management structures and adequate	Water Quality Run-off water from the construction area Drainage of wastewater on the ground can 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	<ul style="list-style-type: none"> Control of groundwater water pollution from construction activities 	<ul style="list-style-type: none"> Use of spill prevention trays and impermeable sheets to avoid contamination of the groundwater water. 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. 	<p>During construction phase by the Contractor/EE/community in coordination with Project staff</p> <p>During O&M phase by the community</p>	Project Manager	E&S Focal Person Relevant EPA

Project Outputs	E&S Parameters / Impacts	Targets to be Achieved	Mitigation / Preventive Action	Responsibilities		
				Implementation	Supervision	Monitoring
capacity for operation and maintenance of wetlands. Output 5.2: 15 selected	various other insects in the area. Leakage of oil and chemical materials from construction activity		<ul style="list-style-type: none"> 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. 			
waterways/ponds in Sindh Province restored/rehabilitated, including installation of water quality monitoring systems and establishing and strengthening operation, maintenance, and management structures.	<p>Waste Generation</p> <p>Construction waste from construction activities</p> <p>Domestic waste from worker's camp</p> <p>Hazardous waste such as dry batteries, chemicals, paints, etc.</p>	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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 	<p>During construction phase by the Contractor/EE/community in coordination with Project staff</p> <p>During O&M phase by the community</p>	Project Manager	E&S Focal Person Relevant EPA
	Noise Noise caused by construction machinery and vehicles used for the mobilization of construction equipment and workers	<ul style="list-style-type: none"> Compliance with Prescribed local environmental quality standards to control Noise pollution 	<ul style="list-style-type: none"> The contractor will strictly follow the locally prescribed environmental quality standards for ambient noise. Control noise through control of working hours and selection of less noisy equipment. 	During construction phase by the Contractor/EE/community in coordination with Project staff	Project Manager	E&S Focal Person Relevant EPA

Project Outputs	E&S Parameters / Impacts	Targets to be Achieved	Mitigation / Preventive Action	Responsibilities		
				Implementation	Supervision	Monitoring
			<ul style="list-style-type: none"> Prohibit the use of pressure horns. Provision of acoustic enclosures (hood and shrouds) on the generator. Proper maintenance of vehicles and construction equipment. Minimize/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. 	During O&M phase by the community		
	Materials Management	<ul style="list-style-type: none"> Safe and secure environment for construction workers 	<ul style="list-style-type: none"> 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 	<p>During construction phase by the Contractor/EE/community in coordination with Project staff</p> <p>During O&M phase by the community</p>	Project Manager	<p>E&S Focal Person</p> <p>Relevant EPA</p>

Project Outputs	E&S Parameters / Impacts	Targets to be Achieved	Mitigation / Preventive Action	Responsibilities		
				Implementation	Supervision	Monitoring
	Socio-economic Impacts	<ul style="list-style-type: none"> • Prevention of conflicts among locals and make the project socially acceptable. • Empowerment of locals to the possible extent • Increase in employment and business opportunities for locals 	<ul style="list-style-type: none"> • Contractors' activities and movement of staff to be restricted to designated construction areas. • 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. • Lighting on the construction site shall be pointed downwards and away from oncoming traffic. 	<p>During construction phase by the Contractor/EE/community in coordination with Project staff</p> <p>During O&M phase by the community</p>	Project Manager	<p>E&S Focal Person</p> <p>Relevant EPA</p>

Annex 4: Grievance Redressal Mechanism

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 marginalized 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.²⁹ 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.

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 Handling Mechanism (ACHM) of the Adaptation Fund.

2.1. ICIMOD's (IE) Grievance Redressal Mechanism

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:

- **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.

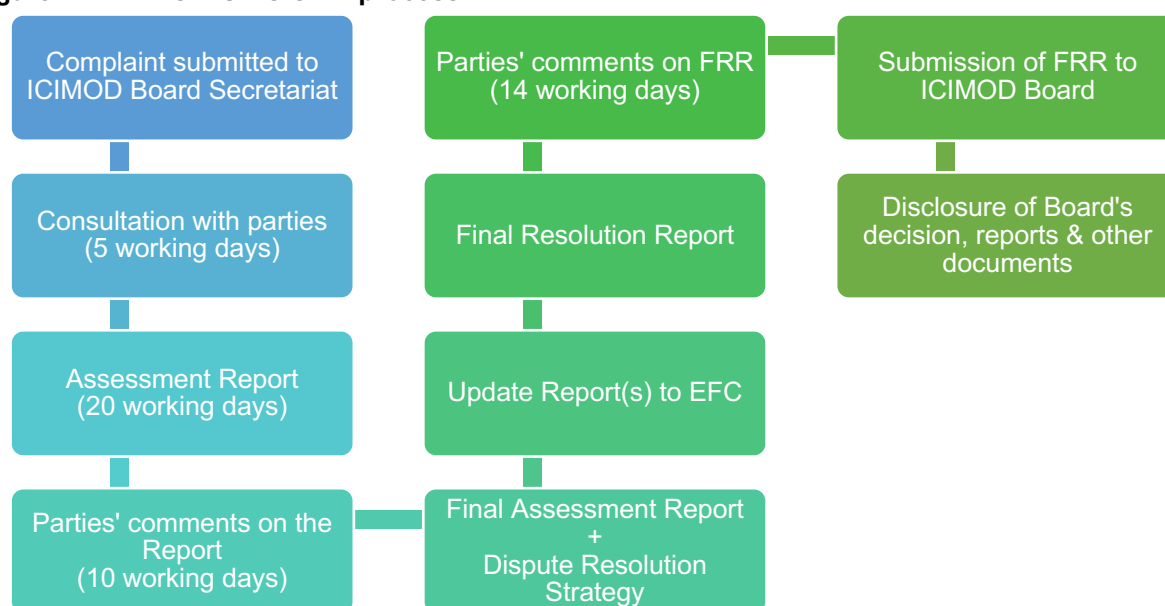
²⁹ Adaptation Fund: Ad Hoc Complaint Handling Mechanism (<https://www.adaptation-fund.org/projects-programmes/accountability-complaints/ad-hoc-complaint-handling-mechanism-achm/>).

- **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.

2.1.2. Addressing and Closing Grievance

Once the ICIMOD Board Secretariat receives the complaint, 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 satisfactorily, 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 7.

Figure 7: ICIMOD's GRM process



2.2. AF's Ad hoc Complaint Handling 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.

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 Complaint

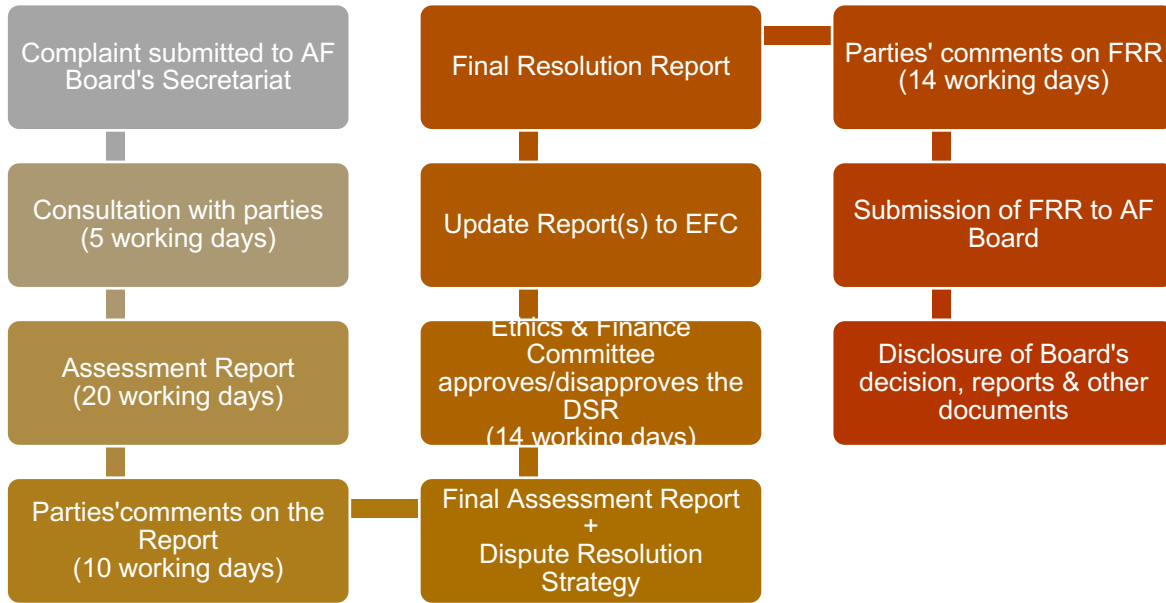
- **Name, title, addresses and contact details** (phone, fax, email address, etc.) of the complainant and representative(s) if appointed. If representative(s) submits a complaint, s/he must attach to the complaint written evidence that s/he is authorised to act on behalf of the people submitting the 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 8) with the timelines of various steps.

Figure 8: ACHM process



Annex 5: Gender Assessment and Action Plan

This annex provides a comprehensive Gender Assessment and Action Plan for the SAFER programme 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 was 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 is 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 will focus on gender-disaggregated socioeconomic and cultural data for Pakistan, with a particular emphasis on climate-dependent sectors around River Indus. It will establish a gender baseline, outlining gender disparities, examining gender-differentiated impacts and risks, and identifying 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 Gender Action Plan (GAP) presented in 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, available research available on gender and climate in Pakistan, and other gender and climate-related national and regional reports was conducted to gain an understanding of the gender considerations applicable to project's activities and scope. The way in which gender norms and performances interact with the nexus of climate change and security are pervasive and varied. It is critical to understand how these interactions occur, to forecast and mitigate risks. The assessment was done with a multi-disciplinary approach from 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 severe challenge in analysing climate change sectors in Pakistan. There is has been no unified baseline of data sets, while in 2022 launched National Gender Data portal with the support UN Women attempts to collect all official gender related data under one platform. Yet, therefore, dated statistics must be relied upon to conceive a picture of climate stress. Some gaps in data have been filled by UN agencies, whose Multiple Indicator Cluster Surveys demonstrate 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, individual's 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 often first responders in disasters and humanitarian crises and, due to their unique knowledge of communities and the environment, **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** to the success of peacebuilding, human security, natural resource governance and mediation initiatives. It is very important to signify their need to rely on their community to build social support system-based resilience that may overcome the effects of violence, stress, and anxiety. There is a need to support women's organizations and groups to develop social support networks at the local level.

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 Green Climate Fund (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 programs like Ten Billion Tree Tsunami Programme (TBTP), 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 prioritization 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.

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 (GoP). 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. Socio-economic 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 urbanization, water intensive agriculture and industrialization.

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 National Disaster Management Authority (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&EC and National Disaster Management Agency (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 **less 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

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 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.
7. 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, 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 aims to enhance women's and other marginalised groups access and role in managing Indus Basin water resources, fostering greater resilience among local communities. The Gender Assessment has informed a gender transformative approach to project implementation.

The project incorporates gender-related concerns through various 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 20% representation of women at all levels planning and decision making across all six components and in the projects'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 execution, and ensuring fair conditions for individuals engaged in all project activities.
- Collect gender disaggregated data and monitor gender related progress during implementation through identification of specific gender related indicators.
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- 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.
- Focus on gender-responsive planning: This involves developing gender-responsive community contingency plans and risk mitigation and climate resilience community plans.
- Develop a Gender-responsive stakeholder engagement strategy under the gender action plan that will provide specific guidelines and tools for implementing gender mainstreaming across project activities.
- Develop and apply 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 disaster preparedness and community awareness programs.
- Propose proactive engagement of women, marginalized groups, and gender experts. The project will actively involve these groups in consultations, activities, and trainings to ensure their contributions and perspectives are considered. For instance, women's groups will be actively involved 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

A technical officer hired by UN Women and integrated into the Project Governance Structure will assume responsibility for overseeing the Gender Action Plan (GAP) in collaboration with the Project Management Team. The officer will be tasked with submitting semi-annual reports 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.

Gender Action Plan: Gender responsiveness of project outcomes/activities

Project Components	Outputs	Gender-responsive Fund Outcome Indicators	Gender Action	Target Gender Achievement	Means of Verifications
1. Cryosphere Disaster Risk Reduction	1.1. Integrated cryosphere risk mapping through community engagement.	Loss of life and property due to climate-induced cryosphere multi-hazards is reduced, and community resilience in the target sites in Khyber Pakhtunkhwa and Gilgit-Baltistan is strengthened	<ul style="list-style-type: none"> • Ensure participation of women in the risk mapping; Community Watch groups and networks; design of the CB-MEWS; and evacuation plans. • 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 risk assessment of the targeted vulnerable communities that enables focusing on the adaptation mechanisms and solutions identified and co-developed with women. • Conduct targeted capacity building sessions for women to respond to potential hazards that compliment risk resilience efforts of Disaster Management Agencies. 	<ul style="list-style-type: none"> • Community-level risk assessment identifies gendered risks and is guided by the perceptions of local women in the target communities 	<p>Final assessment</p> <p>Assessment methodology</p>
	1.2. Community-based monitoring and early warning systems established.		<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • Community monitoring plan; evacuation plan; and CB-CWS are gender inclusive addressing the differentiated needs of the target populations 	<p>Final Plans</p> <p>Participation lists of community capacity building workshops and communication channels</p>
	1.3. Strengthened resilience to cryosphere-related risks.			<ul style="list-style-type: none"> • Recommendations on disaster response 	<p>Operating procedures of</p>

Project Components	Outputs	Gender-responsive Fund Outcome Indicators	Gender Action	Target Gender Achievement	Means of Verifications
				standards are gender inclusive	local disaster responses
2. Springshed Revival and Management	2.1. A comprehensive web-based information management system of spring-sheds and springs prepared for Malakand and Hazara divisions.	Communities in Khyber Pakhtunkhwa, and Hazara have increased access to spring water leading to more climate adaptive water use in the targeted communities in a gender inclusive manner.	<ul style="list-style-type: none"> 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 participation of women in the co-design of the recharge solutions; data monitoring systems; Spring users' groups. Adopt and apply gender-inclusive 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-sensitive capacity building sessions 	<ul style="list-style-type: none"> Springs inventory and assessment are gender inclusive 	Final assessment
	2.2. Recharge measures (for improved spring-shed practices, land use planning, and bioengineering) co-developed and implemented.			<ul style="list-style-type: none"> No of women participated in the co-design exercise 	List of participants of the co-design exercise
	2.3. Local governance framework for spring-shed established with enhanced institutional capacity for efficient water resource management.			<ul style="list-style-type: none"> Local institutional capacity on gender-inclusive approaches increased 	Interviews
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.	<p>Groundwater use is more adapted to mitigating climate change related shocks, mitigating loss of income and health impacts.</p> <p>Communities in flood prone areas provided with sustainable and climate resilient water supply services</p>	<ul style="list-style-type: none"> Ensure participation of women in groundwater study and mapping; feasibility study and community-based structures. Ensure gender-inclusive approach to development of the technical training course. 	<ul style="list-style-type: none"> Groundwater study and feasibility study are gender inclusive. Community-based structures include women members. 	<p>Final study and mapping</p> <p>Community-based structures reports</p> <p>Pre- and post-assessments of the technical training courses.</p>
	3.2. Climate-smart and resilient water supply infrastructure established in selected sites, along			<ul style="list-style-type: none"> Ensure participation of women in assessment of flood-affected community water supply systems 	<ul style="list-style-type: none"> Community water supply system assessment is

Project Components	Outputs	Gender-responsive Fund Outcome Indicators	Gender Action	Target Gender Achievement	Means of Verifications
	with contextually relevant management structures with adequate capacity for operation and maintenance of the community infrastructure.		<ul style="list-style-type: none"> Ensure that women community members and women-led households benefit from the solar-powered facilitates and hand-pumps. 	<ul style="list-style-type: none"> gender inclusive. No. of women/women-led households using/benefitting from solar powered facilitates and handpumps 	<ul style="list-style-type: none"> water supply systems Monitoring reports Final programme reports
4. Ecosystem-Based Adaptation	4.1. Targeted intervention sites identified for evidence based, climate adaptive and focused WASH interventions.	WASH infrastructure in communities is more adaptive to climate change-induced shocks in the targeted communities in the Middle Indus Basin, with up-scaling of the NBS solutions across the basin as contextually appropriate.	<ul style="list-style-type: none"> Ensure a gender-sensitive approach in secondary WASH analysis. Ensure participation of women in environmental and feasibility assessment. 	<ul style="list-style-type: none"> WASH analysis is gender inclusive. No. of women in feasibility assessment 	<ul style="list-style-type: none"> 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.		<ul style="list-style-type: none"> Ensure participation and benefit of women in wetlands and Sewage treatment plans. 	<ul style="list-style-type: none"> No. of women/women-led households using/benefitting from sewage treatment plans 	<ul style="list-style-type: none"> Monitoring reports Final programme reports
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.	Loss of life, property, and livelihood due to climate-induced shocks is reduced in the targeted communities, and communities can recover from said shocks more rapidly and effectively.	<ul style="list-style-type: none"> Ensure gender-inclusive approach in ground-truthing of catchment feasibility study. 	<ul style="list-style-type: none"> Ground-truthing study is gender inclusive. 	<ul style="list-style-type: none"> Final study
	5.2. 15 selected waterways/ponds in Sindh Province		<ul style="list-style-type: none"> Ensure participation and benefit of women in natural waterways and automatic water quality monitoring 	<ul style="list-style-type: none"> Women participate and benefit from 	<ul style="list-style-type: none"> Monitoring reports

Project Components	Outputs	Gender-responsive Fund Outcome Indicators	Gender Action	Target Gender Achievement	Means of Verifications
	restored/rehabilitated, including the installation of water quality monitoring systems and establishing and strengthening operation, maintenance, and management structures.		<p>systems as well as in communal ponds construction and upgrade.</p> <ul style="list-style-type: none"> • Ensure participation of women in communal pond management committees. 	<p>water quality monitoring systems and communal pond management committees.</p>	<p>Final programme report</p> <p>Communal management committees meeting minutes</p>
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-centered 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 lead to the mitigation of climate change induced loss of life and property.	<ul style="list-style-type: none"> • Ensure a gender-inclusive approach in gap analysis. • Ensure women's participation in co-development and implementation of advocacy actions for improved groundwater policies. • Ensure women-led process of development of participatory and gender-responsive water management adaptation plans. • Ensure a gender-inclusive approach and apply new social technologies to consultations, co-development processes, and capacity-building workshops for authorities. 	<ul style="list-style-type: none"> • Gap analysis is gender inclusive. • Women participate and lead advocacy actions that are gender inclusive. • Water management adaptation plans are gender inclusive. 	<p>Final gap analysis</p> <p>Monitoring and final reports</p> <p>Water management adaptation plans</p> <p>Capacity building workshop reports</p>
	6.2. An extensive knowledge repository on climate change and WASH practices developed.		<ul style="list-style-type: none"> • Ensure gender-responsive data and gender-inclusive data collection mechanisms and practices that feed into the ccGAP. • Collect local data and use that to develop contextualized narratives on gender inequality and the differential burdens of climate impacts on women and men. • Ensure women's participation and input in validation workshops and development of knowledge products, including One Catalogue, technical papers, etc. 	<ul style="list-style-type: none"> • Data collection mechanisms include gender-inclusive indicators. • Local data provides evidence of gendered impacts of climate change. • Women participate in data collection/analysis/dissemination. 	<p>Data collection mechanisms and indicators</p> <p>Qualitative data</p> <p>Data collection workshops and meeting minutes</p>

Project Components	Outputs	Gender-responsive Fund Outcome Indicators	Gender Action	Target Gender Achievement	Means of Verifications
	6.3. Community-led adaptation solutions widely adopted through awareness-raising and behavioural change.		<ul style="list-style-type: none"> • Mobilize women community members, particularly young women, to participate and take the lead in public-private partnerships and CGPCCP portal applications at the community level through targeted capacity workshops and engagement activities. • Ensure participation and build leadership of young women on the district Youth Forums and water management adaptation plans. • Ensure women's participation and build leadership in the co-development of success stories and case studies that highlight the overall disproportionate impacts of climate change on women and girls and how these impacts are worsened by gender norms. • Build capacity for women-led advocacy and public awareness campaigns that create awareness of the local impacts of climate change and the ways they affect women and men differently. 	<ul style="list-style-type: none"> • Women, particularly young women, participate and lead community-level activities, including awareness raising and policy advocacy actions. • Women and young women participate in District Forums and water management adaptation plans. • Public awareness on gendered impacts of climate change has increased. • Capacities of the local and national level authorities on the gendered impacts of climate change and how to mitigate and address them has increased. 	<p>Monitoring and programme report on community level activities and public campaigns</p> <p>District Forum meeting minutes and action plans</p> <p>Public awareness campaign materials</p> <p>Interviews and pre-and post-test of capacity building activities</p>