

Scaling-up of GLOF Risk Reduct-UNDP- PAK-00104582

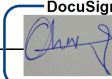
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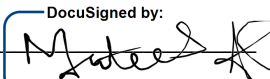
Narrative

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Executive Summary

2. Background

3. Key Results Achieved

- **Level of Reporting:**

Project level results

Contributing Outcomes:

Contributing Outputs:

Progress Note:

1. Mainstream climate change into development planning The Project strengthened the institutional capacities of MoCC&EC and the Planning & Development Departments of KP and GB through the deployment of specialized technical experts, including climate change, disaster risk reduction, safeguarding, engineering, finance, and coordination specialists. This technical support enhanced government capacity to design, implement, and oversee climate-responsive development and adaptation programming at federal and provincial levels. 2. Strengthened coordination and implementation of Climate Change Adaptation Action Plans The Project enabled improved inter-institutional coordination through the development of a National Climate Change Adaptation Action Plan and two provincial Climate Change Adaptation Action Plans (CCAAPs) for KP and GB. Capacity-building initiatives included trainings for federal and provincial government representatives on CCAAP implementation and the Project's Gender Action Plan. Institutional readiness was further enhanced through the strengthening of GIS laboratories, development of hazard vulnerability risk assessments and GIS maps, formulation of provincial contingency and disaster management plans, and the establishment of a comprehensive Glacial Lake Inventory by the Pakistan Meteorological Department (PMD). 3. Expanded weather surveillance and discharge monitoring networks Out of a total of 292 planned stations for implementation, after 8 being exempted by PMD, a total of 284 automatic monitoring and warning stations (measuring weather, rainfall/snowfall, river discharges, river/lake water levels, linked to sirens in vulnerable communities) were installed and operationalized, transmitting real-time hydro-meteorological data and triggering warnings upon reaching dangerous thresholds. Supporting infrastructure included the rehabilitation of 12 PMD observatories and the establishment of 3 Master Control Rooms for EWS monitoring and maintenance. In addition to regular on-site support, PMD staff received 7 specialized trainings, including international factory-level training, to ensure system functionality and sustainability. Accessibility routes to high-altitude glacier and monitoring sites were also developed to enable effective community-based surveillance. 4. Effective early warnings to protect communities

from climate-induced risks Communities were capacitated to respond to GLOF and climate-induced hazards through 1,103 specialized trainings benefiting 67,338 individuals, including 27,784 women and girls. These initiatives encompassed mock drills, awareness sessions, coordination meetings, and reciprocal learning visits, ensuring inclusive participation and context-specific risk reduction practices. 25 Community-Based Disaster Risk Management Committees and 24 Hazard Watch Groups were established and equipped to support early warning dissemination, preparedness, and localized monitoring. 5. Long-term structural measures to reduce GLOF risks The Project implemented extensive small-scale and nature-based infrastructural interventions to enhance long-term climate resilience. These included the construction of 430 (213 in GB, 217 in KP; totalling to 36,243 ft.) small-scale infrastructures that mainly include gabion walls or water diversion structures, rehabilitation of 317 (204 in GB, 113 in KP; totalling to 414,194 ft.) irrigation channels, slope stabilization of 760 Ha (430 Ha in GB, 331 Ha in KP) through bio-engineering, establishment of 25 (17 in GB, 8 in KP) Community-Based Disaster Risk Management Centers and 67 (49 in GB, 18 in KP) Safe Havens, and development of 23 (17 in GB, 6 in KP) access routes (pony treks) to EWS sites . Collectively, these measures reduced exposure to flood risks while strengthening livelihoods and ecosystem stability. 6. Improved financial resilience and livelihood. These interventions particularly enhanced women's economic participation and adaptive capacity

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4. Key Challenges Encountered

- **Level of Reporting:**

Project level results

Contributing Outcomes:

Contributing Outputs:

Progress Note:

At the inception phase of the project, project activities were delayed for approximately two years because of disagreement on project governance mechanism with the executing entity - Ministry of Climate Change. While the issue was resolved eventually, it meant that the implementation plan had to be adjusted to accommodate the delays, including requesting for project extension. The high value procurement of EWS was also a challenge. UNDP pitched for using UNDP LTAs through the Central

Procurement Unit of UNDP, but the Government was reluctant, and in the end open bidding was done and purchase of EWS was completed. UNDP handled this through its central procurement unit ensuring efficiency and cost effectiveness. Implementation of the Project was initially planned on the assumption that infrastructure works, installation of monitoring equipment and community engagement activities would proceed in a progressive sequence across the targeted valleys. In practice, the high-mountain environment significantly influenced timelines and required repeated adjustments. Access to several valleys (Kandia, Muthat, Arindu) was limited to short seasonal weather windows, as snowfall, landslides and glacial melt conditions frequently restricted mobility. Construction teams were occasionally required to demobilize and return in subsequent seasons, extending installation timelines beyond initial projections. The Project also anticipated that early warning systems would become operational shortly after installation. However, the terrain affected both sensor stability and communication reliability. The systems required calibration, repeated testing and modification of installation platforms before consistent data transmission could be achieved. Connectivity solutions using satellite data increased the O&M costs and had to be used to ensure uninterrupted monitoring, which extended the commissioning period. It was further expected that protective infrastructure would be installed and maintained under stable operating conditions. During implementation, severe flood events damaged completed structures and temporarily cut off access to project districts. Implementation efforts therefore shifted toward rehabilitation and redesigning certain works to withstand higher-than-anticipated water flows. Institutional arrangements were expected to allow monitoring information to be immediately integrated into disaster response procedures. In practice, authorities required additional time to operationalize coordination mechanisms and clarify response responsibilities. EWS information initially remained technical data until operational protocols and simulation exercises were introduced. At the community level, infrastructure placement and evacuation route development were planned following technical site selection. In several valleys, communal land ownership and local decision-making processes required consultations and mediation before work could begin, which delayed construction but was necessary for long-term acceptance. In 2025, when Pakistan experienced a second flood disaster, the EWS stations had been established for barely a year. During this time, there was a lot of negative and false media coverage which the project had to handle. UNDP had to carefully navigate the issue, including through engagement of its headquarters in New York. The issue had to be resolved through engagement of experts and properly devised media strategies, including communication over social media. Finally, awareness and preparedness activities were expected to engage men and women simultaneously. In some remote communities, gendered socio-cultural norms limited mixed participation, requiring adapted engagement approaches before women could meaningfully participate in preparedness activities.

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5. Project Risks and Issues

The risks were mainly related to SES and implementation due to multiple stakeholders. But project is successfully closed operationally on 31 Dec 2025.

6. Lessons Learned

- Implementation across remote and highly climate-vulnerable valleys generated valuable lessons for future climate adaptation programming: 1. Accounting for climate risks and seasonal constraints High-altitude terrain and limited weather windows necessitate careful planning of construction and installation activities. The 2022 flood events underscored the importance of flexible implementation schedules and climate-responsive rehabilitation strategies. 2. Strategic infrastructure and access planning The development of access routes proved critical for enabling construction, monitoring, and maintenance activities in previously isolated valleys, enhancing both project delivery and long-term resilience. 3. Gender-responsive capacity building Separate trainings and mock drills for women were essential in conservative contexts to ensure meaningful participation, leadership, and representation in community disaster risk governance structures. 4. Technical and operational optimization of Early Warning Systems Field verification of network coverage, adaptive equipment configuration, and streamlined regulatory processes (including environmental approvals) are essential for effective EWS deployment and sustainability.
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7. Conclusions and Way Forward

The Project’s Exit Strategy prioritized sustainability through the systematic transfer of assets, responsibilities, and knowledge to provincial governments and local communities. All structural interventions were formally handed over to relevant provincial line departments through endorsed agreements outlining maintenance responsibilities and budgetary obligations. Operational responsibility for the EWS network was transferred to PMD, supported by comprehensive technical training on system maintenance, data analysis, and standard operating procedures. Community-level ownership was reinforced through participatory sessions, feedback mechanisms, and knowledge-sharing forums, ensuring continued utilization of project interventions beyond closure. Communities were also informed of grievance redressal mechanisms to address post-project concerns. The GLOF-II project has laid the sustainable foundation on which ongoing and future initiatives can build. This included extensive capacity building within technical agencies and communities which further strengthens sustainability. UNDP will further utilise this framework and approach in follow up projects, including through a new Chinese-funded project which will be implemented in the

following two years. Funded activity's contributions to the Green Climate Fund's (GCF) objectives The Project directly benefited 732,320 individuals (358,299 women, 374,022 men) across GB and KP through climate adaptation training, early warning preparedness, and structural risk reduction measures, including 67,338 individuals (27,784 women) reached through awareness and preparedness initiatives. EWS coverage expanded protection to an additional 642,933 individuals, significantly increasing adaptive capacity compared to the pre-project baseline of approximately 14,000 beneficiaries. By mainstreaming Climate Change Adaptation Action Plans into national and provincial policy frameworks, strengthening institutional capacity, and delivering gender-responsive, community-based adaptation solutions, GLOF-II made a substantial contribution to GCF's objectives of enhancing climate resilience, protecting vulnerable populations, and enabling sustainable, inclusive adaptation pathways. The Project achieved these results through an integrated, multi-layered risk reduction approach aligned with GCF Fund-level adaptation indicators, particularly increased resilience of vulnerable populations (including number of direct and indirect beneficiaries) and reduced exposure of infrastructure and built environments to climate-related hazards. This was operationalized through real-time hazard monitoring, early warning dissemination, community preparedness, protective infrastructure, ecosystem stabilization, and climate-resilient livelihoods. By establishing 284 early warning monitoring stations linked to national and sub-national institutions, strengthening community-based disaster response mechanisms, and implementing both structural and ecosystem-based measures, the Project significantly expanded early warning coverage and reduced vulnerability at scale. Impact was driven by the functional integration of forecasting, preparedness, and institutional coordination, supported by adaptive management that shifted emphasis from infrastructure delivery to operational readiness and community response capacity. This approach not only delivered against core GCF indicators but also institutionalized climate risk management within government systems, enabling sustained, scalable, and inclusive adaptation pathways.

8. Other Reporting Requirements

- **Reporting Requirements**

Gender-responsive engagement approaches were introduced where mixed participation was limited. Separate sessions enabled women to participate in preparedness activities and improved dissemination of warnings at household level, strengthening overall effectiveness of early warning communication. In some remote communities, gendered socio-cultural norms limited mixed participation, requiring adapted engagement approaches before women could meaningfully participate in preparedness activities. Economic resilience and gender-responsive livelihoods Economic resilience was strengthened through livelihood diversification and financial inclusion measures. Climate-resilient livelihood trainings engaged 2,773 women in activities such as kitchen gardening, livestock management, honey-bee farming, tailoring, oil extraction and wool processing, reducing dependence on climate-sensitive income sources. Gender-responsive approaches were integrated to address participation barriers in remote mountain communities. Separate preparedness drills engaged 2,557 women and girls, while women's representation in Community-Based Disaster Risk Management Centers enabled participation in local decision-making. Women constituted 24% of disaster management committees in GB and 15% in KP and represented 70% of

livelihood beneficiaries. In total, 23,746 women and girls benefited from targeted engagement mechanisms, strengthening household preparedness and improving dissemination of early warning information. These measures recognized women’s roles as primary household resource managers and increased the effectiveness of risk communication at the family level. The livelihood component shifted women’s participation from unpaid household labour to income-generating activities, improving intra-household decision-making power. This contributed to adaptive capacity by increasing financial autonomy, allowing households to invest in preparedness and recovery measures independently of external assistance. Despite the prevalent socio-cultural norms hindering the representation of women, inclusion remained integral for gender-informed dialogues to take course. 396 women (368 GB, 28 KP) are part of the Hazard Watch Groups, while 123 women (93 GB, 30 KP) are part of the CBDRM Committees. Separate trainings and mock drills for women were essential in conservative contexts to ensure meaningful participation, leadership, and representation in community disaster risk governance structures.

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