1. Project Data

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<td>P154036</td>
<td>Disaster Resilience Improvement Project</td>
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Prepared by Cynthia Nunez-Ollero
Reviewed by Vibecke Dixon
ICR Review Coordinator Kavita Mathur
Group IEGSD (Unit 4)

2. Project Objectives and Components

a. Objectives

According to the Financing Agreement (FA, p. 5) and the Project Appraisal Document (PAD, paragraph 20), the Project Development Objectives (PDOs) were to support the restoration of flood protection infrastructure and strengthen the recipient's capacity to manage disasters and climate variability.

The eight districts of Neelum, Hattian, Bagh, Poonch, Haveli, Kotli, Bhimber, and Muzaffarabad were referred to as the State (PAD, paragraph 7).
This review will parse the PDO into two objectives against which project performance will be assessed:

1. To support the restoration of flood protection infrastructure
2. To strengthen the recipient's capacity to manage disasters and climate variability

b. Were the project objectives/key associated outcome targets revised during implementation? No

c. Will a split evaluation be undertaken? No

d. Components

1. **Restoring Flood Protection Infrastructure and Upgrading Flood Management Systems**: (US$100 million at appraisal, US$89.3 million actual). Three sub-components were to be financed under this component: (i) the restoration of flood protection infrastructure that was damaged by the 2014 floods. The activities to be financed included the restoration of flood embankments to resilient standards, rehabilitation of other infrastructure such as spurs and river channelization works; (ii) feasibility studies and diagnostics for medium- to long-term investments in flood protection works; and (iii) non-structural measures such as establishing a Decision Support System (DSS), a safety evaluation of the flood protection infrastructures; support for the Irrigation Research Institute to conduct relevant studies and training; and conduct river morphology studies and floodplain mapping of selected eastern rivers. The activities that would lead to a DSS, river morphology studies, and flood plain mapping outputs were dropped at restructuring (see Dates below).

2. **Managing Disasters and Climate Variability**: (US$17 million at appraisal, increased to US$21 million at restructuring, US$20.1 million actual). This component was to finance US$14.0 million worth of technical assistance directed at the Punjab province and another US$3.0 million to the eight districts of Neelum, Hattian, Bagh, Poonch, Haveli, Kotli, Bhimber, and Muzaffarabad, collectively referred to as the state in this project. The technical assistance (TA) was to finance: (i) studies on urban and flash flooding in Punjab province and slope stabilization in the state; (ii) policy reviews to strengthen district level disaster risk management institutions, improve their early warning systems; and mainstream disaster risk management and climate variability aspects in planning processes of the Punjab Planning and Development Department; and (iii) a Disaster Risk Financing Strategy, an appropriate governance structure, standard operating procedures, fiduciary safeguards and controls, a standard emergency cash transfer system, and a transparent allocation criteria for the Punjab Provincial Disaster Management Fund.

3. **Project Management**: (US$8 million at appraisal, US$5.1 million actual). This component was to finance project management undertaken by the implementation units in the Punjab Irrigation Department (PID), the Punjab Disaster Management Authority (PDMA) and the State Planning and Development (P&D) department.

4. **Contingent Emergency Response**: (US$0 million at appraisal, US$0 million actual). This component was to finance emergency response and recovery following a disaster by reallocating uncommitted funds or receive additional financing.
e. Comments on Project Cost, Financing, Borrower Contribution, and Dates

Project Cost: The original total project cost was US$125.0 million. The actual total project cost was US$117.0 million.

Financing: The International Development Association (IDA) financed this credit. The original credit was US$125.0 million. A total of US$8.0 million was cancelled due to currency fluctuations and cancellation of some project activities (see Dates below). The credit disbursed US$US$114.6 million (according to ICR, Annex 3 but the ICR Data Sheet noted US$115.6 million). The balance of US$1.4 million was cancelled.

Borrower Contribution: None

Dates: The project was approved on June 2, 2015 and made effective on September 14, 2015. The Mid Term Review (MTR) was conducted on September 28, 2018. The original closing date was December 1, 2019. The project was extended twice for a total of 24 months to close on November 30, 2021. There were 3 level 2 restructurings:

- On September 23, 2019 to extend the closing date for the first time by 13 months from December 1, 2019 to December 31, 2020; cancel the financing of the DSS, river morphology studies, and flood plain mapping; and reallocate US$4.0 million from the PID to the State P&D department.
- On December 9, 2020 to extend the closing date a second time, for 11 more months, from December 1, 2020 to November 30, 2021 because of the impact of the COVID19 pandemic.
- On November 30, 2021 to cancel US$8.0 million. The project used savings from exchange rate gains (PKR to US$), difference between estimated and actual costs, and the cancellation of some activities to finance additional subprojects.

Split Rating: No split rating of the outcome is undertaken. The PDOs and outcome indicators were unchanged throughout project implementation. Certain activities were dropped that did not significantly affect the achievement or the original level of ambition of the objectives.

3. Relevance of Objectives

Rationale

The country is vulnerable to flooding. In 2014, floods hit Punjab and the eight districts of Neelum, Hattian, Bagh, Poonch, Haveli, Kotli, Bhimber, and Muzaffarabad (collectively referred to as the “State,” PAD, paragraph 7). The National Disaster Management Authority (NDMA) estimated that the floods affected over 2.5 million people in both urban and rural areas and caused 367 deaths, damaged homes, agriculture, transport, irrigation, and communications infrastructure.

Country Context: The 2010 National Disaster Management Act laid out the country’s disaster management strategy involving the central and subnational entities. At the central level, the NDMA, the Earthquake Reconstruction and Rehabilitation Authority, Emergency Relief Cell, and the Federal Flood Commission, had overlapping mandates. At the provincial level, there were the Provincial Disaster Management Authorities, the Provincial Irrigation Departments, and the Civil Defense and Rescue Services.
Some provincial entities had authority over administrative regions. At the district level, a number of districts had Disaster Management Authorities. An 18th amendment to the 2010 Act devolved some powers to the provinces, with greater responsibility for preparing and responding to disasters (PAD, paragraph 11). However, the 2010 Act has not been fully implemented and lacks operational details (PAD, paragraph 13). According to the PAD, subnational levels need to be armed with medium- and long-term planning for recovery and reconstruction, and to foster resilience.

**Country Plans**: The PDOs were relevant to the country’s Vision 2025. This country plan aimed for sustained and inclusive economic growth by focusing on resilience to fiscal shocks and disasters. The plan also prioritized institutional reform. The project directly contributed to the Punjab province’s focus on agricultural productivity by reducing losses due to flooding events through flood protection infrastructure restored to resilient standards (ICR, paragraph 26).

**Alignment with the World Bank Strategy**: The PDOs were relevant to the World Bank’s Country Partnership Strategy (CPS) for FY2015-20. The CPS was extended by another year to align with the country's electoral and the IDA18 cycles. The Bank's Country Partnership Framework for 2022-2026 is currently under consultation.

The project was consistent with the inclusionary focus of the CPS. Improving the country's disaster risk management capacity was an outcome indicator for Outcome 3.3: "Increased resilience to disasters in target regions," by increasing the number of provinces with disaster risk management plans, improved disaster risk management, and having early warning systems in place. The project supported the third cross cutting theme in the CPS of reducing vulnerability to climate change and improving disaster preparedness. The second theme focused on deepening provincial level engagement and clarifying the roles between the state and local governments, as this project addressed. The Systematic Country Diagnostic Report also pointed out that the country is vulnerable to natural hazards, particularly floods, cyclones, and droughts. This vulnerability to natural disasters and climate change hampers the achievement of macroeconomic stability, social cohesion, and environment sustainability. An unplanned process of urbanization and the poor quality of buildings and infrastructures amplify the vulnerability of people to natural disasters.

**World Bank Experience in the Sector and in the Country**: According to the PAD, the Bank had extensive disaster risk management experience in the region and in Pakistan. Several capacity development and institutional development projects were also noted such as the Bank support to anticipatory risk management. The Bank had provided technical assistance to the government to highlight physical and fiscal risks from hazards, including risk assessments of federal and provincial capitals. The Jhelum and Tawi Flood Recovery Project (P154990) was under preparation at the same time as this project. The Bank was to deliver a US$188 million IDA-funded Pakistan Hydromet and Climate Services Project which aims to strengthen Pakistan’s public-sector delivery of reliable and timely hydro-meteorological services and enhance community resilience to shocks. The project is expected to improve weather forecasting in Pakistan and facilitate sustainable management of around 80,000 hectares of forest area. The Bank was also engaged with federal and provincial governments to improve understanding of climate risks and green transition of the economy.

Overall, the relevance of the project's objective is rated Substantial. The project objectives addressed the development problem caused by the floods. The Bank experience, expertise, and strategy for the country fit
the problem being addressed. The objectives were substantially relevant to the country plans to strengthen the preparedness capacity at the subnational level to respond to disasters and climate change impacts.

Rating
Substantial

4. Achievement of Objectives (Efficacy)

OBJECTIVE 1

Objective
To support the restoration of flood protection infrastructure.

Rationale
Theory of Change: A Theory of Change (TOC) was not required at appraisal (ICR, paragraph 7) but the results framework provided a causal link between three outputs and four outcomes to restore flood protection (PAD, Annex 1). A TOC was prepared at closing (ICR, Figure 1). The TOC provided a logical link between the infrastructure inputs and outputs to achieve the disaster resilient flood protection.

Inputs were to include the construction of flood protection works such as the rehabilitation of embankments, procurement of instruments, and carrying out analytical flood control works. These inputs were logically linked to lead to the outputs.

Outputs were to include the rehabilitated embankments, number of flood protection works, and early warning systems in place. The Punjab Irrigation Department requested to cancel other outputs - establishing a Decision Support System (DSS) for the provincial irrigation departments, studies on river morphology, and floodplain maps - at the first restructuring after prolonged delays and new priorities of its Flood Risk Assessment Unit. The outputs identified in the TOC were reasonably linked to the inputs from the interventions.

Outcomes were the reduced loss of lives, property, and livelihoods in the target area based on the restored flood preventive measures. The inputs and outputs were reasonably linked to this outcome that a certain level of protection was achieved for the target population. However, the outcome indicator, number of beneficiaries, was more of an intermediate rather than an outcome indicator. This was not sufficient to express the development impact on the lives saved and loss of livelihoods of the beneficiaries. However, this indicator is accepted as a reasonable impact from preventive measures in place (see Section 9 M&E Design below). Other outcomes were to be reported based on the analysis of project benefits (see Section 5 Efficiency below).

The TOC noted the following three critical assumptions to make the achievement of the objective more likely: (i) the Project Implementation Units (PIUs) had dedicated staff and sufficient capacity to execute the project; (ii) adequate Operations and Maintenance (O&M) budget was allocated and capacity to maintain the investments; and (iii) the Punjab Irrigation Department would use the analytical work to design and execute
additional works. These assumptions were borne out at implementation and contributed to the achievement of the project outcomes. Another assumption was the retention of staff who have been trained in O&M of the built infrastructure, in addition to O&M budgets.

**Outputs:**

According to the results framework, the following outputs were achieved:

- 5 (target 4, target *exceeded*) preparatory analytical works for flood protection investments were completed to support medium- to long-term investments in Punjab and the State. Project savings led to one additional study to be completed.
- 73 civil works (target 51, target *exceeded*) flood protection works were completed with 22 civil works in Punjab (380.5 km) and 51 in the State (19.89 km). Some civil works could not be undertaken following technical, social, and environmental assessments.
- 400.4 km (target 500 km, target *almost achieved*) of embankment were constructed or rehabilitated. The target was set at Mid Term as allowed under the framework approach of an emergency project.

The ICR also reported that the following outputs were achieved. These additional outputs were not included in the results framework and did not include targets:

- The Punjab Irrigation Department’s new Water Resources Division was provided with the following:
  - Information Communication Technology (ICT) and technical equipment.
  - 152 flood fighting vehicles for its field units.
  - Hydrographic survey boat.
  - Computers, and hardware for its Hydraulic Structure Safety Evaluation Unit.
  - Deep well inspection cameras and water monitoring units for the Irrigation Research Institute.
- 104 male and four female executive, superintendent, and chief irrigation engineers were trained.
- In the State, 184 individuals were trained on disaster risk reduction policies, geographic information system (GIS) analysis, information technology (IT) and monitoring and evaluation (M&E).
- In Punjab, supervision consultants and the PIU conducted 22 training workshops on environmental and social safeguards for 853 participants including contactor staff, labor, community activists as well as officials of relevant government departments (ICR, paragraph 79).
- Exchange rate gains and project savings led to an additional 28 km of flood protection; and eight structures valued at PKR0.56 million (ICR, paragraph 34).

The following outputs were *not achieved* because these were dropped at restructuring: the establishment of a DSS for the provincial irrigation departments, studies on river morphology, and floodplain maps.

**Outcomes:**

According to the results framework, the following outcomes were achieved:

- 9,391,391 people were counted as direct beneficiaries (target 2,000,000 target *exceeded*) of these, 1,490,000 were from the State and another 7,900,000 were from Punjab province. The target was exceeded because of the added flood protection works; a higher rate of individuals receiving early warning notifications; procurement of additional goods and services due to project savings; and additional beneficiaries receiving support as part of the COVID19 response.
• 4,646,436 female beneficiaries with 3,872,420 from Punjab and another 774,016 from the State (1,000,000, target exceeded). The target was exceeded because:
  o Most project interventions were designed to equally benefit male and female beneficiaries.
  o Gender dimensions were considered in all proposed studies, civil works, and disaster management plans.
  o Community based interventions consulted women.
  o Female participation was ensured in capacity development programs.

The ICR also reported that the following outcomes were achieved. These additional outcomes were not included in the results framework and did not include targets.

• Nonstructural measures enhanced the flood management capabilities of the Punjab Irrigation Department.
  o The operationalization of the new Water Resources Division enhanced the PID’s capacity to undertake integrated water resources management.
  o Strengthened the capacity of the Hydraulic Structure Safety Evaluation Unit to assess structural safety of flood protection works by conducting hydrographic studies and analyzing data.
  o improved the O&M capacity of the Irrigation Research Institute by giving them the tools to manage future climate impacts.
  o Strengthen on-ground flood mitigation response capacity during flood emergencies by having field teams in place.

• The additional flood protection works benefited 206 settlements.

The following outcomes were also not included in the results framework, had no targets, and were reported under the outcome assessments conducted at closing:

  o The restoration works, (fencing water channels, repair of powerhouse approach roads and channel beds, lining at power channels) reduced the vulnerability of powerhouses to floods and improved the resilience of electricity supply in the state.
    o Load shedding was reduced from 8 to 3 hours a day.
    o Power voltage increased from 160 to 220 volts.
    o Daily generation losses decreased (no data).
    o State revenues increased by up to 25 percent (PKR150 million, no baseline provided).
    o Power channel rehabilitation at Qadirabad and Rehras hydel (hydro-electric) power stations increased generation capacity from 0.293 MW to 1.371 MW plus an additional PKR9.8 million in revenues (ICR, paragraph 31).
  o The rehabilitation of flood works reduced losses and damages due to floods. The 2019 floods in Punjab and the State damaged 239 houses and led to 69 deaths compared to the 2014 floods that damaged 129,880 houses and led to 367 deaths. However, the monsoon rainfall in 2014 was the second highest for the State and fourth highest in Punjab since 1961 (ICR, footnote 15).
  o According to focus group discussions with target communities in the State at closing, land prices around project sites increased twelve-fold (no data).
  o Exchange rate gains and project savings that led to saving over 127,900 acres of land (no data on method), benefited 670,452 persons (ICR, paragraph 34).
Overall, the efficacy of the project to achieve this objective is rated Substantial. The intermediate outcomes reported, from the original TOC and additional outcomes from the assessments conducted at closing, reasonably point to the restoration of the flood protection infrastructure. The other outcomes reported outside of the TOC pointed to the reduced impact from the 2019 floods as a result of the restored preventive flood infrastructure measures.

Rating
Substantial

OBJECTIVE 2
Objective
To strengthen capacity to manage disasters and climate variability.

Rationale
Theory of Change: The TOC at closing provided a causal link among the inputs, outputs, and outcomes to achieve this objective. The capacity building inputs directed at the State and Punjab institutions reasonably led to the outputs. The outputs, when adopted and implemented, would enhance local capacity to manage floods and other disaster events caused by climate variability.

Inputs were to include technical assistance, studies, and capacity building activities directed at the Punjab Province and the State. The State referred to the 8 districts of Neelum, Hattian, Bagh, Poonch, Haveli, Kotli, Bhimber, and Muzaffarabad (PAD, paragraph 7). These inputs were logically sequenced to lead to the outputs to enhance local disaster management capacity.

Outputs were to include the completed studies, and the standard operating procedures for the Punjab Disaster Management Fund. These outputs were reasonably attributed to the inputs. Studies on urban flash flooding in Punjab and slope stabilization in the State were not undertaken as client priorities evolved at implementation and these studies were dropped.

Outcomes were to be the strengthened capacity at the local level to manage disasters and climate variability. The TOC expressed this outcome as the number of direct beneficiaries as part of core indicators, including the share of female beneficiaries, and the number of at-risk people receiving early warning notifications and plans that subnational departments have adopted. These outcome indicators from the results framework were more at an intermediate rather than outcome level and were insufficient to express strengthened capacity. The use of these outputs to save lives and protect from the impact of disasters from climate variability could show strengthened capacity. There were no indicators to reflect the impact of the strengthened capacity or that adopted plans would be sustained after the project closed, e.g., that budgetary support for systems and equipment were in place or how strengthened capacity were performed in managing subsequent disasters.

The TOC noted the following 3 critical assumptions to enhance the likelihood that the outcomes of this objective would be achieved: (i) the Disaster Management Authorities (DMAs) will incorporate studies in future projects; (ii) agencies will utilize institutional mechanisms after the project; (iii) skilled personnel and
equipment will be available to agencies after the project. Note that these assumptions were more applicable to sustaining the outcome rather than influencing the achievement of the outcomes.

Outputs:

According to the results framework, the following outputs were achieved:

- 12 studies that identified risks were completed (target 4, target exceeded). These studies included climate change study in Punjab, mapping of major nullah’s and tributaries to identify proposed gauging stations for flood warning and mitigation in the State. Punjab PDMA also developed district level multi-hazard vulnerability and risk assessments. A Multi-hazard Vulnerability and Risk Assessment for 15 districts in Punjab were completed, printed, and disseminated to raise awareness on the frequency, magnitude, and spatial extent of hazards.

- Operational procedures for responding to disasters were in place, achieving target.
  - In Punjab, a community-based disaster risk management program at the provincial level was developed.
  - In the State, disaster management plans were developed for all districts.

- Standard operating procedures for the Punjab Disaster Management Fund were established, achieving target. However, one of the focus areas to better manage the contingent liability and meet financial needs for post disaster emergency response and reconstruction in Punjab was not met. Standard operating procedures for combating COVID19 were prepared and disseminated.

The ICR also reported that the following outputs were achieved. These additional outputs were not included in the results framework and did not include targets.

- Capacity assessment plans were prepared for the State Disaster Management Authority, the Land Use Plan at the State Planning and Development Department, and for the Punjab Provincial Disaster Management Authority and its district level Disaster Management Authorities. The plans identified various equipment needs.
  - The Punjab PDMA procured mobile communication office to monitor relief and rescue operations in remote areas, undertake public service announcements, and disseminate key awareness messages. Other equipment procured included 72 breathing apparatus, 36 hydraulic concrete chainsaw, 36 hydraulic combi tools, 8 water bowser, 6 fiber optic cameras, a geographic information system (GIS) mapping services, a search and rescue drone, 2 fire fighting vehicles, 6 earthquake and disaster search and rescue vans, 9 water rescue units, and 4 digital satellite news gathering vans.
  - The State DMA and 10 district DMAs received 17 fire tenders, 12 water bowser, 11 ambulances, 3 cranes, 12 small fire tenders.
  - Soil testing equipment, high resolution satellite imagery, and information technology (IT) equipment were used by the Land Use Plan of the State Planning and Development Department to prepare digital maps, assess land use patterns, and classify land use, uploaded on the Department’s website.

- Trained Punjab PDMA team on the use of the inundation model to simulate flood extents, highlight areas to be inundated, and identify villages in hazard zones. 225 government officials were trained to manage grassroots organizations. At the State level, a visit to Sri Lanka on procurement was conducted; job orientation for 54 newly recruited district DMA staff; and disaster risk reduction planning for 28 government officials were conducted. At the State level, 184 individuals were trained...
on disaster risk reduction policies, GIS analysis, Information Technology, and M&E. In Punjab, supervision consultants and PIU conducted 22 training workshops on environmental and social safeguards for 853 participants including contractor staff, labor, community activists as well as officials of relevant government departments.

- The Punjab PDMA developed a contact database of 2.98 million at-risk individuals who could be notified of disaster risk through text messages. The Punjab PDMA dispatched 6.15 million early warning messages throughout the life of the project.
- The Punjab PDMA headquarters established a state-of-the-art Emergency Operation Center (EOC) to serve as a hub for data collection, processing, and dissemination in real time and facilitate informed decision making.

Outcomes:

According to the results framework, the following outcomes were achieved:

- 4,355,781 direct beneficiaries were reported (target 2,000,000 target exceeded)
- 2,177,150 female beneficiaries were reported (target 1,000,000 target exceeded)
- 2,980,000 at-risk people received early warning notifications through mobile short messaging services (baseline 50,000, target 500,000 target exceeded). The Punjab PDMA dealt with numerous shocks such as urban and flash flooding, smog, monsoon, heatwaves, locust infestation, and COVID19 pandemic. These emergencies expanded the use of the existing early warning notification system. The early warning messages sent directly to mobile phones in affected areas for them to take precautionary measures (storing essential commodities, evacuation, or relocation) to help avoid human and material losses. Future financing of services from telecom companies for text message dissemination will be undertaken by the government of Punjab’s annual allocation of PKR1.0 billion for disaster response.
- Integrated disaster management plans were developed and adopted by departments at subnational levels, to reflect improved institutional capacity for flood risk management as targeted.
  - The State Disaster Management Authority (SDMA) developed disaster risk management plans for both the State and the 10 districts. The plans were approved by the Disaster Management Commission. The district plans were approved by the respective District Disaster Management Authorities in the State.
  - In Punjab, the provincial and district plans were developed and approved by Punjab PDMA. These plans increased the ability of the government to absorb, accommodate, and recover from disasters and climate variabilities. Prevention, preparedness, response, rehabilitation, and recovery allowed the mainstreaming of disaster management at the subnational levels.

The ICR also reported that the following outcomes were achieved. These additional outcomes were not included in the results framework and did not include targets.

- The disseminated district assessments identified vulnerable areas and increased the knowledge base on disaster and climate variability by helping districts develop disaster risk management plans including strategic and cost effective evacuations for at-risk communities.
- In post training survey, 89 percent of participants expressed satisfaction with the training content and increased their confidence and motivation. During the 2019 floods, with reduced response time, trained teams quickly notified at-risk communities of the coming floods.
• The PDMA IT team used GIS-based applications to manage the surveillance and monitoring dashboard for locust infestation of the Food and Agriculture Organization (FAO).
• PDMA also maintained apps to monitor philanthropic donations, locust monitoring, and smog reporting.
• The Punjab PDMA Emergency Operation Center (EOC) served as a hub for data collection, processing, and dissemination in real time and facilitate informed decision making. The EOC served as a research center to analyze, control, and manage different phases of disaster response. Future outreach by the EOC was to be undertaken by the district level EOCs across all 36 districts. The District EOCs were to provide critical grassroots level disaster risk management and 24/7 reporting and rapid response. District level DMAs will consolidate their disaster management services. Similar EOCs were also established at the center and in 10 districts of the State (ICR, paragraph 46).
• The EOC demonstrated its capacity during the COVID-19 outbreak by generating GIS-based “heat maps” situational trend analysis, trend reports, multiple alerts, for public outreach. These facilitated real-time monitoring of the COVID-19 outbreak across all 36 districts of Punjab. Data collected from the districts supported other initiatives such as emergency disbursements of cash assistance programs and relief activities.
• Punjab PDMA established 700 Village Emergency Loss of Livelihoods Reporting and Facilitation Centers (VERFCs) as flagship initiative at the sub-district and village levels to support decentralized decision making, disaster response, and information dissemination following calamities. These centers will collect First Information Reports during disasters at the community level, digitize the data to provide real-time information to control rooms, district law enforcement agencies, and other disaster response agencies. During COVID-19, the VERFCs collected data, disseminate information to health centers, and allocated resources to local communities. This increased efficiency of government, reduced operational burdens for urban centers, improved response times, and enhanced coordination across government departments.

Overall, the efficacy of the project to achieve this objective is rated Substantial. There is some evidence that capacity was built to address future disasters at the subnational level. Punjab was acknowledged to lead the transition to a data and technology-driven disaster risk reduction architecture and serve as a model for the Khyber Pakhtunkhwa province, promoting inter- and intra-provincial coordination for disaster risk reduction and climate change.

Rating
Substantial

OVERALL EFFICACY
Rationale
The overall efficacy of the project to achieve the first objective is rated Substantial. All the indicators were exceeded. There is a reasonable expectation that the residents benefited from the restored flood protection infrastructure. However, as noted above, the indicators in the results framework did not sufficiently reflect the outcome of the restored preventive infrastructure. Evidence from the 2019 floods were reported to reduce the
negative impact on the lives (reduced loss of lives) and livelihoods (reduced value of property damaged) although these were not part of the TOC or its results framework.

The efficacy of the project to achieve the second objective is rated Substantial evident in the institutional response to the natural disasters such as the 2019 floods, the locust infestation, the smog alerts, and COVID19. The efficacy of the project to achieve this objective is not rated High because of a lack of indicators to show the development impact of improved capacity on the lives and livelihoods of the target community (see for example the benefits cited in Section 5 Efficiency below)

Overall Efficacy Rating
Substantial

5. Efficiency

Economic Efficiency: At appraisal, a benefit cost analysis was conducted. Three types of benefits were identified: (i) lives saved and reduced casualties as measured by the value of statistical life and of statistical injury; (ii) worth of reduced damage to private and public physical infrastructure using assumptions of the Q theory of investment and externalities of public goods; and (iii) externalities such as reduced land erosion, fewer losses of crops and livestock, resilient physical infrastructure, easy mobility, trained personnel equipped with state-of-the-art instruments to better perform their jobs, appreciation of land value for the vulnerable segment, rehabilitation of water schemes and other infrastructure, and expanded economic activity due to the multiplier effect of project spending (PAD, paragraphs 57-63). The Q-theory of investment states that all fluctuations in investment are related to marginal Q, i.e., the ratio of the shadow value to the market price of a unit of capital. While some of the benefits can easily be quantified, others, such as systemic improvements, research, and information dissemination, are more difficult to measure. The net present value of the benefits was estimated to average US$835.5 million. Cost was estimated at US$125 million. The average benefit-cost ratio of the project was estimated at 5.6.

At closing, efficiency analysis included available additional data from the expanded project scope. Economic benefits were estimated over 10 years after the project closed. A 5 percent discount rate was used. The discount rate for human related benefits was adjusted for population growth. The analysis used PKR175/USD exchange rate (ICR, footnote 21). The average present value of the estimated economic benefits was US$2.5 billion. Costs were estimated at US$114.6 million since US$8 million was cancelled. The same 14 benefits that were quantified at appraisal were also used to arrive at the estimated benefits at closing. The average benefit-cost ratio at closing was estimated at 22.2.

Administrative and Operational Efficiency: The project faced implementation delays, but the extended period led to achieving or exceeding certain outcome targets. The project was prepared in a limited time frame because it was an emergency response. The framework approach allowed the government to respond to evolving priorities. The State (eight districts of Neelum, Hattian, Bagh, Poonch, Haveli, Kotli, Bhimber, and Muzaffarabad) had limited experience in Bank-financed operations that led to extended discussions regarding skillsets, competencies, and resources to set up the PIU. Some procedures proved lengthy. The government created an umbrella coordination (PC-1) and required PC-1s for each PIU. The PIUs experienced lengthy approval processes in hiring the Third-Party Monitoring & Validation (TPV) firm in Punjab and in procuring vehicles and
instruments. The 2018 general elections led to delays in obtaining approvals. The Punjab Irrigation Department's Flood Risk Assessment Unit changed its priorities and the government requested to cancel setting up a Decision Support System (DSS) and related river morphology studies. The project period was extended twice, with a total of 24-month extension. First, to complete the contracted civil works and other activities after delays (see Section 8 Assessment of Bank Performance at Supervision below); and second, to address the impact of COVID19. The delay led to losing approximately US$122 million in opportunity cost of benefits because people in target areas remained vulnerable for an additional period (ICR, paragraph 55). The project cancelled US$8 million at closing because of cost savings. The project used the savings to finance additional activities and resulted in exceeding targets.

Overall, the project efficiency is rated Substantial. The high benefit-cost ratio led to good value for money. The implementation delays and cancelled activities did not reduce the level of ambition of the operation. This was countered by the use of cost savings to favor the achievement of the PDOs.

**Efficiency Rating**

Substantial

a. If available, enter the Economic Rate of Return (ERR) and/or Financial Rate of Return (FRR) at appraisal and the re-estimated value at evaluation:

<table>
<thead>
<tr>
<th>Rate Available?</th>
<th>Point value (%)</th>
<th>*Coverage/Scope (%)</th>
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<tr>
<td>ICR Estimate</td>
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* Refers to percent of total project cost for which ERR/FRR was calculated.

6. Outcome

The relevance of the objectives is rated Substantial. The PDOs established a strong alignment with the government's development plan and the Bank's partnership strategy. The country's vulnerability to natural hazards and climate change were to be addressed by strengthening local preparedness capacity. The efficacy of the project to achieve the first objective is rated Substantial because of achieving the restored flood protection infrastructure, albeit with minor shortcomings in the choice of outcome indicators. The efficacy of the project to achieve the second objective is rated Substantial because of the evidence of the strengthened future capacity to manage disasters and climate variability at the subnational levels. The overall efficacy of the project to achieve its objectives is rated Substantial. The project strengthened DMAs future disaster resilience evident in the use of systems and processes originally focused on flood protection to respond to COVID19. Efficiency is rated Substantial despite initial delays, two-year extension, and dropping of some initially planned investments as cost savings made up for the delayed benefits. The framework approach allowed for responding to evolving government priorities. The overall outcome is rated Satisfactory.
a. Outcome Rating
Satisfactory

7. Risk to Development Outcome

The following pose substantially high risks to the development outcomes:

- **Risk from retaining capacity built**: In this project, political will supported the capacity built in Punjab and the State. However, the skilled technical personnel trained in the DRM sector need to be retained in the medium- and long-term. To mitigate this risk in Punjab, the provincial government indicated its commitment to continue with the staff and processes initiated under the project (ICR, Annex 5). The ICR had no information what the State has committed to in the medium term after the project closed. Future interventions will build on the outcome of this project for greater disaster risk management impact in the province.

- **Risks to sustaining processes introduced by the project**: In this project, changes to policies, operational procedures, and management plans remain to be implemented and enforced, Sub national governments’ financial resources are constrained and pose a risk that there are insufficient O&M budgets for the rehabilitated infrastructure after project close. No information was provided regarding the future needs of technology related outputs that need periodic updating. To mitigate this risk, all subprojects completed under this project were allocated O&M costs under the recurrent budget but unclear on the scope and period covered.

- **Risk from natural hazards and climate change**: In this project, effects of climate change can significantly alter future flooding patterns and exposure to other disasters. Considering rapid urbanization, inappropriate land-use planning, environmental degradation as well as an ongoing pandemic, the vulnerability of affected communities is likely to increase. Such risks can be further examined and included for mitigation in future engagement with the Government.

8. Assessment of Bank Performance

a. Quality-at-Entry

The Bank team designed this project as a strategic response to the 2014 floods emergency and the country's disaster risk management agenda, for provincial governments to move beyond relief and more toward medium- and long-term planning for resilience. The Bank team adopted a framework approach where the government had a prospective list of investments. These sub-projects and work sites were to be finalized using agreed upon criteria during implementation. Activities could change as government priorities evolved. The Bank team focused on ex-post restoration of damaged infrastructure to resilient standards, and ex-ante enhancement of a government capacity covering a wide geographic area but originally focused only on flood-related disasters. The Bank team closely coordinated with the parallel Jhelum and Tawi Flood Recovery Project (P154990). Both projects were jointly presented for Board approval. The Bank team designed the project informed by lessons from other Bank-financed recovery
projects (e.g., the Balochistan Disaster Management Project). The Bank team adequately assessed the technical, institutional, financial, and human capacities of the subnational government level including departments for civil works allocating operations and maintenance (O&M) budgets for infrastructure. Implementation arrangements were adequate. Two Project Implementation Units (PIU) - one at the Punjab Irrigation Department (PID) of the Punjab Disaster Management Authority (PDMA), and the other at the State Planning and Development (P&D) Department with dedicated staff were to oversee project implementation. M&E functions were to be carried out by the PIUs. However, the emergency nature of the project and its narrow preparation period caused initial delays in setting up the PIUs (see Supervision below). The State had limited experience in Bank-financed operations. Required skillsets, competencies, and adequate resources were discussed at length in setting up the State PIU. Environmental and social safeguards were adequately assessed (see Section 10 Other Issues below).

Overall, the performance of the Bank team at entry is rated Satisfactory with minor shortcomings in assessing the readiness of the State PIU to implement the project.

Quality-at-Entry Rating
Satisfactory

b. Quality of supervision
The Bank team conducted 13 supervision missions over the 6 year period, including virtual missions during the COVID19 pandemic. Training in compliance with environmental and social safeguards were carried out in the initial set up of the PIUs. Implementation delays were adequately addressed with training and repurposing of resources to respond to the COVID19 pandemic using the disaster management teams of the project.

The Bank team responded to the delays by adding technical and sectoral experts to join the regular supervision missions and provided sectoral experts. The Bank team supported the PIUs by conducting training in procurement and contract management including capacity building training of contractors. These trainings were useful because PDMA Punjab faced issues with staff retention. Clearing safeguards in awarding the State civil works improved with increased capacity of the safeguards team. Implementation improved with timely completion of the actions agreed during Implementation Support Missions (ISMs). In Punjab, no disbursements in FY2018-2019 were due to postponed approvals in anticipation of the July 2018 national elections. A new government set-up and bureaucracy changes further delayed decision making. This slowdown was a key reason for the first project extension.

Government regulations on financing caused some operational delays. Procurement of flood fighting vehicles for the PID faced delays due to lack of timely approvals as the Punjab government pursued austerity. The Pakistani Rupee (PKR) depreciated against the US Dollar (USD), resulting in differences in projected and actual costs. The exchange rate gains, cancelled activities due to changes in government priorities, and the differences in estimated and actual costs led to significant project savings. The Bank team worked with the government to use the savings for additional investments resulting in exceeding target indicators even as US$8 million in uncommitted funds was cancelled.

The COVID19 pandemic lockdowns and health risks for staff interrupted implementation. The Bank team supported Punjab and the State in pandemic emergency response, by financing and procuring medical and
The objectives were clearly stated, although one was narrowly defined to focus only on flood prevention; the other, broad in coverage but originally only focused on flood management capacity. The theory of change documented how the key activities (inputs) and outputs would lead to expected intermediate outcomes (outputs). The number of beneficiaries is more of an intermediate outcome but generally accepted as indicative of emergency interventions. In the case of the second objective, not all possible outcomes of the interventions were reflected in the outcome indicators of the results framework. Those outcomes were noted under the heading "Other Outcomes" rather than as part of the results framework. Due to a lack of data, targets were set as percentages at appraisal, and were revised to exact figures at the Mid Term Review (MTR). The indicators consisting of both quantitative and qualitative targets were measurable, achievable, realistic, relevant, and time bound. However, they were only focused on reporting on beneficiaries and not on development outcome of the interventions. For example, the three outcome indicators were supported by a total of five outputs. But two of the three outcome indicators were beneficiary related and the third outcome indicator was only a Yes/No value.

The indicators were selected to monitor progress of component activities. The M&E staff was to collect and report at regular intervals with data sources, frequency, methods, and responsibility for collection. Progress on all indicators was to be submitted on an annual basis. The M&E design was project specific. There was no information in the ICR that the system would continue after the project closed.
b. M&E Implementation

The M&E system was implemented by the three PIUs - the Punjab Provincial Disaster Management Authority (PDMA), the Punjab Irrigation Department (PID), and the State P&D Department. Each PIU had an M&E Specialist to coordinate and consolidate reporting. PIUs regularly monitored all physical outputs. Site visits were conducted when Third-Party Monitoring & Validation (TPV) firms were unavailable. Submission of progress reports was not always timely. There were delays in PID hiring a TPV firm, because the Cabinet Committee had to approve the contract. This practice was not previously required and caused delays. Other options for contracting the services for TPV were suggested. The PID PIU directly contracted a TPV firm in July 2021 for 10.5 months. Over time, the timeliness and quality of data improved. M&E was supplemented by post training surveys. Baselines were provided by post disaster needs assessments (ICR, footnotes 6 and 7).

c. M&E Utilization

The M&E data was used to prepare project progress reports for use by management to monitor progress. Respective line departments used M&E data to address performance. The findings from the project’s M&E were used to inform corrective measures, informed decision making, and resource allocation. The quality of the evidence provided to support the achievement of the PDOs were sufficient to support the rating of efficacy although the indicators were not part of the results framework or the Theory of Change.

The overall M&E Quality is Substantial. There were moderate shortcomings in M&E design. Lack of baselines (mentioned in Section 12 Lessons below) led to approximate initial targets expressed as percentages. The framework approach in design allowed to set more exact targets at Mid Term. The M&E system was generally sufficient to assess the achievement of the inputs. Survey at closing provided some evaluation of outcomes although most would have to be assessed after sufficient time has shown the adoption of the processes and capacity built. The M&E data was utilized to effectively track progress, monitor project activities, and record results against the PDO.

M&E Quality Rating
Substantial

10. Other Issues

a. Safeguards

**Environmental Safeguards**: The project was classified as a category “B”, and triggered OP 4.01 Environmental Assessment and OP 7.50 Projects on International Waterways. Environmental impacts were related to civil works associated with restoration and rehabilitation of flood embankments and damaged flood protection walls, raising and strengthening of riverbanks and spurs. The project prepared an Environmental and Social Management Framework (ESMF). The safeguard instruments were disclosed on April 29, 2015. Site specific Environmental and Social Management Plans (ESMPs) were prepared as needed, as civil works sites were finalized. The Punjab and State PIUs were both staffed with dedicated Environmental Specialists throughout the project. Bank staff trained the PIUs in preparing and implementing safeguards instruments. The project was acknowledged to have many good examples of safeguards.
compliance. These were (i) inclusion of safeguards instruments in all bidding documents, (ii) enforcement of penalties for contractors for safeguards non-compliances, (iii) design modifications to avoid tree cutting; (iv) excessive compensatory tree plantation activities and (v) soil bio-engineering techniques in areas of the State prone to landslides and for land restoration. The environmental and social audit by third party also validated safeguards compliance in the field. The project complied with all applicable safeguards policies (ICR, paragraph 76).

**Social Safeguards:** The planned activities involved rehabilitation and repair of existing structure with low to moderate social impact potential. The project triggered OP 4.12 Involuntary Resettlement. Social impacts were anticipated, such as the possible loss of land or infrastructure, or access to land resources. The project team developed a Resettlement Policy Framework (RPF) and site-specific Resettlement Action Plans (RAPs) as needed. The PID and State PIUs remained adequately staffed with a dedicated Social Specialist throughout the project, initially requiring support by the Bank team. No civil works in the State involved any displacement or resettlement. In Punjab, initial engineering designs for rehabilitation of flood protection bunds would have resulted in removing existing residential/communal structures and affect certain roads in at least 16 sub-schemes. Design was modified (adjustment in width, freeboard, wetting channel prism, etc.) in 15 cases to protect these structures, resulting in zero removals or displacement of people. Only one case (Haveli Main Line & Allied Hydraulics) required an Abbreviated Resettlement Action Plan (ARAP). Design adjustments could not protect all the structures and a few structures had to be removed. Four persons affected were paid approximately PKR 1 million in total. The project complied with all applicable safeguards policies (ICR, paragraph 78).

The project website displayed the details of the Grievance Redress Mechanism (GRM) and provided at the civil works sites in English and Urdu. Implementing agencies held a dedicated GRM session at community and stakeholder consultations at project sites. The GRM received and processed complaints at the sub-project level (office of resident engineer) and the PIU level. The project had no land acquisition or resettlement. No grievances on safeguards were registered. Procurement related complaints were received and resolved by the GRM, with copy to the Bank.

Active stakeholder consultation was a good example of social compliance by the project. Most project schemes were carried out in areas where women's mobility and social activity is higher than in other parts of the country. In a few cases (for instance Remodeling of Marginal Bund at Panjnad, and Restoration of JHead Spurs near Kalowal), the stakeholder consultation agenda also included nominating community members to be representatives in local Grievance Redressal Committees (GRCs). Women in GRCs was not a priory, however.

**b. Fiduciary Compliance**

**Financial Management:** The Financial Management system complied with Bank policies. Initial payment delays from the Finance department to the PIUs were experienced but this improved over time. Throughout implementation the PIUs were adequately staffed. Interim Financial Reports were submitted on time, accepted, and recorded into the system. Audit reports were also received in a timely manner and were acceptable to the Bank. Audit reports were issued with unqualified opinion (ICR, paragraph 81).

**Procurement:** All procurement complied with the Bank’s guidelines. These were monitored/tracked using the Bank’s online Systematic Tracking of Exchanges in Procurement (STEP) system. The State PIU
procurement performance was satisfactory. The PDMA and PID PIUs experienced procurement delays. Each PIU reallocated over 20 percent of cancelled procurement - 24 percent for PID, 20 percent for PDMA and 23 percent for the State. These cancelled activities were considered redundant, not pursued further, but also reflected a lack of activity planning. There was also a large variation in contract award time, from 2 to 745 days from bid evaluation to contract award mostly due to delayed management approvals to initiate or conclude procurement activities (ICR, footnote 28). For example, procurement delays led to the cancellation of some activities under the Hydraulic Structure Safety Evaluation. The Health Department provided technical support to help the PDMA PIU to resolve the 5 complaints related to the COVID-19 emergency procurements.

c. Unintended impacts (Positive or Negative)
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d. Other
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### 11. Ratings

<table>
<thead>
<tr>
<th>Ratings</th>
<th>ICR</th>
<th>IEG</th>
<th>Reason for Disagreements/Comment</th>
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</thead>
<tbody>
<tr>
<td>Outcome</td>
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<tr>
<td>Bank Performance</td>
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<tr>
<td>Quality of M&amp;E</td>
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<tr>
<td>Quality of ICR</td>
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### 12. Lessons

The ICR provided five lessons from the operations (ICR, paragraphs 92-96). These are presented below with slight modifications:

- **A broadly formulated objective facilitates a flexible response to evolving needs.** In this project, the objective covered disasters in a broad sense, which managed to include the COVID19 pandemic. The project reallocated resources for the PIUs to support the subnational governments, the disaster management authorities, and other departments in Punjab and the State to address the growing health crisis. The reallocated funds financed activities that contributed to enhancing local disaster management capacity.

- **Specifying sites for possible subprojects prior to project start may enhance readiness of a project using a framework approach.** In this project, appraisal was completed in five months because this was prepared as an emergency response. Adopting a framework approach meant that the government had a list of priority investments. However, infrastructure work sites were approved only as implementation was underway. Delays were experienced because some complex infrastructure works required extended preparation. The
2018 national elections and postponed procurement and contracting decisions also contributed to delays. Identifying work sites for proposed civil works may help spur implementation readiness and avoid delays.

- **Sectors with enhanced capacities may have room to absorb the implementation needs of additional investments financed by cost savings.** In this project, substantial cost savings were generated by the exchange rate gains when the PKR continued to decline against the USD during the life of the project. This led to substantial differences in estimated and actual costs of subprojects. A change in priorities led the government to cancel some activities without changing the level of ambition of the project objectives. These resources were then used to finance additional critical subprojects to achieve disaster resilience, and in some cases, exceed target outcome indicators. Building the capacity of the PIUs in financial management and planning prepared them to absorb and implement the added investments.

- **Strengthened district-level entities may become effective frontline responders to emergencies.** In this project, design focused on enhancing the capacities of disaster management authorities at the grassroots level. In Punjab, this focus translated to adopting district level and community-based disaster management planning; establishing district level emergency operations centers; and village emergency reporting and facilitation centers. In the State, the Disaster Management Agency developed district level disaster risk management plans and participated in procurement. These efforts led to fostering outreach, coordination, and response capacities of local disaster management entities in Punjab and the State. Enhanced capacities were demonstrated in their response to the 2019 floods, generating smog alerts, mapping locust infestation, predicting geographical areas to be affected by heatwaves, and reducing the spread of COVID19.

- **Standardizing Post Disaster Needs Assessments (PDNAs) may help establish baselines for monitoring and evaluating emergency projects.** In this project, lack of baselines for the project interventions led to setting initial targets in percentages. This proved difficult to monitor. Exact targets were established at the mid-term. The framework approach in project design allowed the adjustment of targets during implementation as government priorities evolved. Standardizing baselines, in both methods and minimum targets, may be further refined with ICT tools such as remote sensing, community-based monitoring, or application-based surveys for improved data collection, supervision, and transparency. These tools may help when access to physical sites is limited.

**13. Assessment Recommended?**

Yes

**Please Explain**

Given the recent flood disaster in Pakistan, it would be useful to look at how well the measures undertaken during this project contributed to mitigation efforts.

**14. Comments on Quality of ICR**

...
The ICR provided a clear picture of the project operation. The report was internally consistent and linked the evidence to the findings. The report emphasized the impact of the project interventions, particularly with regard to the capacity built at the local level for both Punjab and the State. The section describing other impacts was helpful to support the efficacy of the project to achieve its objectives. The annexes completed the storyline around efficiency (Annex 4), the commitment of the implementing entities after the project closed (Annex 5) and the detailed impact of the project outputs to the beneficiaries (Annex 6). Lessons were informed by the operation. Annex 4 provided a good overview of the factors that influenced project outcomes. These explanations amplified the project outcomes even as there were no equivalent indicators in the results framework. The report followed OPCS guidelines except for exceeding the suggested number of pages (26 instead of 15).

a. Quality of ICR Rating
   Substantial