



1. Project Data

Project ID P146653	Project Name Uttarakhand Disasater Recovery Project	
Country India	Practice Area(Lead) Urban, Resilience and Land	
L/C/TF Number(s) IBRD-89210,IDA-53130	Closing Date (Original) 31-Dec-2017	Total Project Cost (USD) 319,122,920.46
Bank Approval Date 25-Oct-2013	Closing Date (Actual) 30-Sep-2023	
	IBRD/IDA (USD)	Grants (USD)
Original Commitment	250,000,000.00	0.00
Revised Commitment	338,325,131.19	0.00
Actual	319,122,920.46	0.00

Prepared by Cynthia Nunez-Ollero	Reviewed by Vibecke Dixon	ICR Review Coordinator Avjeet Singh	Group IEGSD (Unit 4)
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2. Project Objectives and Components

a. Objectives

According to the Financing Agreement (FA, p 5) and the Project Appraisal Document (PAD, paragraph 22) the Project Development Objective (PDO) of this Uttarakhand Disaster Recovery Project was "to restore housing, rural connectivity and build the resilience of communities in Uttarakhand and increase the technical capacity of the State entities to respond promptly and effectively to an eligible crisis or emergency."

The PDO may be parsed in the following manner:



- To restore housing in Uttarakhand
- To restore rural connectivity in Uttarakhand
- To build the resilience of communities in Uttarakhand
- To increase the technical capacity of the State entities to respond promptly and effectively to an eligible crisis or emergency.

However, this review will assess project performance against the following two objectives parsed out from the above PDO statement since the reconstruction of the houses and the restoration of rural connectivity were in aid of establishing the resilience of the community in Uttarakhand, indicating that the PDO was to build the resilience of the community:

- To restore housing and rural connectivity in the affected areas to build the resilience of communities in Uttarakhand.
- To increase the technical capacity of the State entities to respond to an eligible crisis or emergency.

According to the PDO as stated in the FA, housing and connectivity were to build the resilience of the community. The ICR highlighted this explanation in justifying the lack of outcome indicators for the objective “to build resilience of communities in Uttarakhand” (ICR, paragraphs 31 and 32). The indicators noted in support of this objective were drawn from the outcomes associated with the restructured housing and restored connectivity in the area. Hence, the two objectives above sufficiently capture the essence of the PDO stated in the FA.

b. Were the project objectives/key associated outcome targets revised during implementation?

Yes

Did the Board approve the revised objectives/key associated outcome targets?

Yes

Date of Board Approval

21-Feb-2019

c. Will a split evaluation be undertaken?

Yes

d. Components

1. **Resilient Infrastructure Reconstruction:** (US\$31 million at appraisal, US\$30 million actual) This component was to finance two subcomponents: The first was **Resilient Permanent Housing** to finance the construction of around 2,500 multi-disaster resilient permanent houses. Houses to be built fell under three categories; (i) those constructed on the land with title deeds and safe for construction; (ii) clustered houses for households who lost both houses and land due to the disaster on land available within the village area; and (iii) clustered houses relocated to a new area for those who lost both houses and land due to the disaster. The government was to provide the land for this third category of clustered house to be developed with basic amenities like school buildings, primary health, and community centers, etc. The second subcomponent was **Resilient Public Buildings** to finance the reconstruction and restoration of partially or



fully damaged structures, equipment and furnishing in public buildings, such as the Panchayati Raj Institution (PRI), Block and District offices, and other technical education institutes.

2. Rural Road Connectivity: (US\$155 million at appraisal, US\$88 million in Additional Financing (AF, consisting of US\$70.4 million from IBRD and US\$17.6 million in government contributions) was added for a total of US\$243 million; US\$207.9 million actual consisting of US\$151.6 million from the original credit and US\$56.3 million from the AF consisting of US\$45.1 from IBRD and US\$11.2 million in government contributions). This component was to finance the restoration of the connectivity lost due to the disaster by reconstructing damaged roads and bridges including village roads, Other District Roads (ODRs, or the link roads between Village Roads and Major District Roads or MDRs), bridle roads and bridges in accordance with the Pradhan Mantri Gram Sadak Yojana (PMGSY) standards. This subcomponent was to also finance the construction of new bridges and drainage works, retaining walls, breast walls and other structures to prevent landslides, and minor realignments. Bridle path, or bridleway, equestrian trail, horse riding path, ride, bridle road, or horse trail, is a trail or a thoroughfare used by people riding on horses. Trails originally created for use by horses now serve a wider range of users, including equestrians, hikers, cyclists, and other pedestrians.

3. Technical Assistance and Capacity Building for Disaster Risk Management: (US\$38 million at appraisal, AF added US\$20 million (consisting of US\$16 million from IBRD and US\$4 million from the government) for a total of US\$58 million; US\$33 million actual consisting of US\$5 million from the original credit and US\$28.5 million from the AF (consisting of US\$22.8 million from IBRD and US\$5.7 million in government contributions). This component was to finance the following seven subcomponents to enhance the capacity of the Uttarakhand Space Applications Centre (USAC): (i) Multi-hazard Risk Assessment, Modeling and Capacity Enhancement of Uttarakhand Space Applications Centre (USAC); (ii) a Decision Support System (DSS), an integrated geo-spatial system that use information from multiple sources to provide access to user-friendly information; (iii) a river morphology study; (iv) a slope stabilization study; (v) enhance the Uttarakhand State Disaster Management Authority (USDMA) by conducting training programs and regular drills for the emergency operations center staff and Disaster Management Officers at the District and State levels; (vi) establish a hydro-meteorological network and early warning system; and (vii) enhance emergency response capabilities. The AF was to finance two more subcomponents - first, the construction of a training facility for disaster risk response personnel and second, specialized training equipment on disaster risk management.

4. Financing Disaster Response Expenses: (US\$12 million at appraisal, US\$8.7 million actual) This component was to retroactively finance eligible expenses that the state had incurred in the immediate post-disaster response period, such as fuel for helicopter rescue missions, hiring of heavy equipment for clearing of roads, etc.

5. Implementation Support: (US\$14 million at appraisal, AF added US\$12 million (consisting of US\$9.6 million from IBRD and US\$2.4 million from the government), for a total of US\$26 million; US\$29.6 million from the original credit and US\$16.4 million from the AF (consisting of US\$13.1 million from IBRD and US\$3.3 million from government contributions), for a total of US\$46 million actual) This component was added to finance costs associated with the operations of the Project Management Unit (PMU) and the respective Project Implementation Units (PIUs) including consultancy costs for project preparation and supervision, training, and knowledge exchange programs.

6. Contingent Emergency Response Component (CERC): (US\$0 million at appraisal, the September 2021 restructuring provided US\$10 million and an additional US\$6.3 million for a total of US\$16.28 million,



US\$13 million from IBRD, actual) This component was to finance the emergency response to a disaster reallocating uncommitted funds from other components above.

e. Comments on Project Cost, Financing, Borrower Contribution, and Dates

Project Cost: The original total project cost was US\$250 million. Another US\$96 million was added as additional financing (AF) for a total of US\$346 million. At closing, a total of US\$319.1 million was disbursed consisting of US\$224.9 million in credits and US\$94.2 million in loans. The balance of US\$19.21 million was cancelled consisting of the remaining undisbursed balance of SDR 4.4 million from the original credit and US\$1.5 million from the loan meant for CERC due to savings from exchange rate gains. According to the Task Team, the two denominations of the balances is more accurate than denominating the unused balance of the project in US\$ because of an unclear applicable exchange rate when the original IDA credit closed.

Financing: There were two sources of financing for the project - the International Development Association (IDA) provided credits of US\$250 million. The International Bank for Reconstruction and Development (IBRD) provided the Additional Financing (AF) of US\$96 million loan including US\$0.24 million in front end fees.

Borrower Contribution: The government did not contribute to the original project cost but committed US\$24 million and disbursed US\$20.2 as part of its contributions to the AF (ICR, Annex 3).

Dates: The project was approved on October 25, 2013 and made effective on February 7, 2014. The Mid Term Review (MTR) was conducted on November 16, 2015. The project was originally scheduled to close on December 31, 2017 but the first restructuring (see below) extended the closing date of the original credit by 18 months. The original credit closed on June 30, 2019. The AF was approved on February 21, 2019 and became effective on April 29, 2019. The original closing date for this AF was March 31, 2022. After the following six level 2 restructurings and one Additional Financing (AF) the project closed on September 30, 2023. The two extensions total 36 months and consisted of the first 18-month extension for the original credit and a second 18-month extension for the AF. The restructurings were as follows:

- On June 23, 2017, to extend the project closing date by 18 months from December 31, 2017 to June 30, 2019 due to (i) infrastructure redesign to improved resilient standards, leading to procurement delays; (ii) slowed construction pace from weather and field conditions; and (iii) delays in establishing capacity to take on the studies under the technical assistance and capacity building component. The credit was closed on June 30, 2019. The undisbursed credit of SDR 4.4 million was cancelled on October 31, 2019.
- On February 21, 2019 to provide US\$96 million from IBRD in Additional Financing. The AF provided additional resources to the following components also noted above: rural roads connectivity, technical assistance for capacity building; project implementation support, and contingency emergency support.
- On October 31, 2019 the balance of the original credit, SDR 4.4 million was cancelled.
- On November 14, 2019 to update the original results framework that was informed by the August 2013 rapid damage and needs assessment. Scope and costs were to be finalized during implementation. The AF adopted the unrevised results framework with the intention of issuing this restructuring paper to make the following changes: adding PDO level indicators for AF-funded



- activities; replacing some indicators with more accurate ones; and modifying targets of some outputs (see Section 4 Efficacy below for more details).
- On October 6, 2020 to finance CERC to augment the ambulance network, procure medical equipment and consumables, strengthen medical labs, and enhance human resources capacity for COVID-19 emergency response. This restructuring made the following changes to the components, costs, targets and output indicators in the results framework, and institutional arrangements:
 - Reduced the targets for the following outputs (i) the number of bridge bridges restored from 88 to 79; and (ii) the number of restored or built road protection works from 15 to 9. The reduced targets were to accommodate the financing of CERC. These targets were to capture the completed activities financed under the original credit. The reduced targets were based on current commitments, implementation progress, cost variations due to COVID-19 restrictions, and to cover the liabilities of completed investments under the original credit.
 - Added intermediate results indicators to capture the customized training for all CERC related vehicles and equipment; availability of gender sensitive training materials; and the construction of the USDMA HQ and EOC building
 - US\$10 million of the AF portion of the costs from the following components were reallocated to finance CERC: (i) components 1 and 4 above remained **unchanged** because these were completed under the original credit; (ii) component 2 was **decreased** from US\$62.9 million to US\$50.32 million; (iii) component 3 was **decreased** from US\$33 million to US\$24.4 million; and (iv) component 5 was **reduced** from US\$11.6 million to US\$9.28 million.
 - A Project Implementing Unit (PIU) was created in the Department of Health to implement CERC-related activities (see Section 5 Administrative and Operational Efficiency below)
 - On December 21, 2021 to reallocate an additional US\$6.28 million to CERC, **reduce** the allocation for component 2 by US\$1.93 million and **reduce** the target of road protection works (from 9 to 8); **reduce** the allocation for component 3 by US\$5.8 million (due to cost variations in training needs) and **add** US\$1.45 million to component 5 for added supervision costs brought by extended contract periods. A new outcome indicator to capture CERC activities (average monthly beneficiaries of CERC-procured equipment) was added; and **reduced** the target for the share of women working at road construction sites (from 10 to 8 percent) because COVID-19 led women migrant labor to return to their villages. The project closing date was extended by 12 months from March 31, 2022 to March 31, 2023 due to implementation delays caused by the COVID-19 pandemic.
 - On March 28, 2023 to extend the project closing date by 6 months from March 31, 2023 to September 30, 2023 to finalize 7 bridge contracts, the USDMA HQ building contract, and procure 1 additional MRI machine under CERC. International shipping delays for specialized material for the USDMA building during the COVID-19 pandemic and an unforeseen rise in steel prices for bridges delayed the finalization of the works. Exchange rate gains resulted in savings to finance an additional Magnetic Resonance Imaging (MRI) machine. The Project Management Unit (PMU) adopted the following measures to ensure the completion of the pending works by September 2023:(i) enhanced coordination mechanisms with contractors including mobilization of additional capacity and working in multiple shifts as required; (ii) enhanced monitoring of construction progress via closed-circuit television (CCTV), drones, and digital monitoring system; (iii) deployment of additional technical resources to the relevant Project Implementation Units (PIUs) to oversee the works; (iv) development of weekly progress targets with contractors; and (v) development of supply chain contingency plans.
 - On September 22, 2023 to cancel US\$1.5 million from CERC. The additional MRI machine envisioned to be procured could not be completed before project closure.



Split Rating: A split rating of the outcome will apply. While the guidelines indicate that “if Additional Financing expanded the scope of the project and the targets related to the increased scope were met, the project would be assessed on the revised targets” (Guidelines, p. 46); targets of output indicators were reduced to accommodate the financing of the CERC. As a result, a split rating of the outcome will apply.

3. Relevance of Objectives

Rationale

Context: The State of Uttarakhand is a Himalayan region mountain state that is regularly affected by flash floods, landslides, wildfires, glacier lake outbursts, and earthquakes. 13 districts clustered in two regions, Kumaon and Garhwal, cover a total area of 53,484 sq. km. Agriculture and tourism are its economic drivers. The state has some of the most important pilgrimage centers known as the “Char-Dham,” the Gangotri, Yamunotri, Kedarnath, and Badrinath. Most of the state’s landmass falls under Seismic Zone IV or V, the highest seismic risk zones of the country, and the state has had 11 major earthquakes over the last century. Uttarakhand’s disaster vulnerability is further exacerbated by climate change. Torrential rainfall, a glacial lake outburst, and ensuing floods in June 2013, destroyed roads, bridges, and houses. The 2013 floods devastated infrastructure and livelihoods in the state with losses estimated to reach 4–5 percent of the state gross domestic product. The death toll was over 6,000 and another 300,000 pilgrims and tourists were trapped in the valleys leading to three of the four Char Dham pilgrimage sites. More than 110,000 stranded pilgrims were rescued, but the government faced an altered topography, vanished road networks, shifting river courses, and a constant threat of landslides. Uttarakhand lacked a holistic approach that integrated risk reduction into critical infrastructure planning. For example, disaster-related interruptions in the transport infrastructure cut off communities from markets, schools, medical facilities, and other economic opportunities and essential services. Uttarakhand’s mountainous topography is challenging to a timely emergency response and reconstruction. To ensure all-weather connectivity, new resilient bridges were required to link locations. Existing bridges required upgrades. Slope stabilization was needed at critical locations to reduce the risk and impact of landslides and to improve safety. Gaps remained in the state’s emergency preparedness. USDMA, the agency coordinating all DRM matters, worked closely with other relevant departments, including the State Disaster Response Force (SDRF, relief and rescue operations), the Uttarakhand Fire and Emergency Services (UFES, first responder for small-scale disaster), and the Forest Department (FD, forest fire management). USDMA’s coordinating role needed to be strengthened through capacity building, enhanced multi-stakeholder Standard Operating Procedures (SOPs), and mandated responsibilities. Agencies lacked the capacity, infrastructure, training facilities, equipment, and technology to fulfill their functions effectively across the entire state.

Country and State Plans: The government of India adopted the Sendai Framework for Disaster Risk Reduction (2015–2030) in March 2015, advocating for an integrated and holistic approach to disaster management that encompassed prevention, mitigation, preparedness, response, recovery, and rehabilitation. The national government set up a Coalition for Disaster Resilient Infrastructure (CDRI) to enhance infrastructure resilience to climate and disaster risks for sustainable development. The government of Uttarakhand adopted a similar vision and priorities in its National Disaster Management Plan (2016). Uttarakhand established the State Disaster Management Authority (USDMA) under the 2005 Disaster Management Act and creating state, district, and village disaster risk management (DRM) plans. The 2014 Uttarakhand Action Plan on Climate Change is the state’s key climate change policy document, presenting climate-resilient development pathways for key sectors. The PDO was relevant to both the



state's and the national plans by combining disaster recovery efforts with long-term resilience and capacity-building initiatives. The state launched initiatives for adaptation and resilience, creating the Uttarakhand State Disaster Management Authority (USDMA), and mandating the preparation of disaster risk management (DRM) plans across state, district, and village levels.

World Bank Country Partnership Framework: The PDO was relevant to the World Bank Group's Country Partnership Framework for India (FY18–22). Together with the October 23, 2023 Performance and Learning Review this CPF was extended to FY 25. The PDO aligned with the CPF Focus Area 1: Promoting Resource-Efficient Growth, to enhance the welfare of rural populations (Objective 1.1), and (Objective 1.5): to improve disaster risk management by supporting resilient infrastructure and state DRM institutions. The PDO was to strengthen the state's analytical and technical capabilities by prioritizing state-of-the-art tools including those that provide real-time support for emergency response. The livability of affected districts was enhanced by rehabilitated roads and bridges, disaster resilient buildings. The PDO was also relevant to the CPF Focus Area 2: Enhancing Competitiveness and Enabling Job Creation, by enhancing connectivity and the resilience of transport infrastructure to improve connectivity and logistics by restoring and upgrading roads and bridges damaged by the disaster. (Objective 2.3) and further aligned with promoting inclusive local approaches in risk management.

World Bank Experience in the Country, in the State, and in the Sector: The World Bank financed or co-financed a number of projects in Uttarakhand: (i) the Uttarakhand Rural Water Supply and Sanitation Project (UKRWSSP) that covered all 13 districts to improve the effectiveness of rural water supply and sanitation services; (ii) the Pradhan Mantri Gram Sadak Yojana (PMGSY) Rural Roads Project where the World Bank co-financed a national government program to improve/establish rural roads that would connect villages to main road networks to facilitate access to markets and services; (iii) the Biodiversity Conservation and Rural Livelihoods Project to develop and promote new conservation models for mainstreaming biodiversity conservation in the Askot Wildlife Sanctuary Landscape, Pithoragarh District; (iv) the Uttarakhand Decentralized Watershed Development Project (Phases I and II) to increase the efficiency of natural resource use and productivity of rainfed agriculture of participating communities in selected micro watersheds; (v) the Uttarakhand Climate Responsive Rainfed Farming Project to make mountain farming emission competitive and profitable in selected micro-watershed. These experiences plus the World Bank's global experience in disaster risk reduction and recovery gives the World Bank a foothold to partner in DRM and climate adaptation in Uttarakhand.

The PDO was pitched at an appropriate level to address the development problems caused by the 2013 floods and the 2020 COVID-19 pandemic. It adequately focused on building the resilience of the community and state institutions to respond to frequent threats from natural hazards.

The relevance of the objective is rated **High**.

Rating

High

4. Achievement of Objectives (Efficacy)



OBJECTIVE 1

Objective

To restore housing and rural connectivity to build resilience of communities in Uttarakhand.

Rationale

Theory of Change: The PDO could have been better stated to show how the components would lead to the outcome of increased resilience rather than appearing to have been sub-objectives by themselves - i.e., to reconstruct housing, or to restore connectivity. Three components were to contribute to achieving the objective of building resilience in communities in Uttarakhand. The first would reconstruct houses and public buildings in the affected communities in compliance with disaster resilient standards to reduce further vulnerability of the residents. The second would reconstruct damaged roads and bridges and restore the connectivity of the road network in compliance with disaster resilient standards. This would restore access to markets and provide opportunities for overall economic development and access to basic services such as health and education services.

Inputs: were to include the financing for the reconstruction of the damaged housing units, public buildings, and the damaged roads and bridges and provision of training in the use of instruments to make the physical infrastructure investments less prone to natural hazards. The Task Team added that inputs were to include training for the owner driven housing reconstruction on disaster resilience features of the structures, awareness raising on grievance redress, advantages of female homeownership, etc.

Outputs were to include the reconstructed disaster resilient housing units and public buildings, reconstructed or new roads and bridges, road protection works including drainage works, retaining walls, breast walls and other structures to prevent landslides, and minor realignments. Roads referred to “other district roads,” village roads or bridle roads. Trails originally created for use by horses now serve a wider range of users, including equestrians, hikers, cyclists, and other pedestrians. Reconstructed or newly built rural roads were to follow the standards of the Pradhan Mantri Gram Sadak Yojana (PMGSY), a government of India poverty reduction strategy designed to sustainably manage the roads network by inter-connecting rural roads using high and uniform technical and management standards.

Outcome: was to be the reduced vulnerability of the beneficiaries since their reconstructed housing units and public buildings were now built according to disaster resilient standards. The indicator in the results framework used the share of restored houses that were multi-hazard resilient, and the share of target villages with restored connectivity. Most of the outcome indicators are at an intermediate or output level rather than measuring results at outcome level, which is what would be expected for an emergency relief project. The ICR acknowledged the lack of outcome indicators in building community resilience.

Critical Assumptions: This was an emergency operation. The August 2013 joint rapid damage and needs assessment informed the project scope and original targets. The scope was to be finalized during implementation, including updating of costs and targets. The TOC identified two critical assumptions that, if realized, were to enhance the achievement of the objective. One was that the state government would set up qualified Project Implementation Units (PIUs); and the second was that the state government would allocate sufficient operation and maintenance (O&M) resources to maintain the physical investments made under the project.



Overall, the inputs and outputs were sufficient to result in the outcomes identified under the results framework.

OUTPUTS:

Under restoring the housing and public buildings destroyed by the disaster:

- 2,382 disaster resilient housing units were reconstructed (original target 2,500 units, target substantially achieved).
- 26 public buildings were reconstructed (original target was 26, target achieved). These buildings included public schools, police stations, fire stations, food warehouses, a permanent state of the art facility for training the staff of the State Disaster Response Force (SDRF) and a disaster resilient headquarters for the Uttarakhand State Disaster Management Authority (USDMA). Retrofitted the educational buildings.

Under restoring rural connectivity of communities in Uttarakhand

- 1,572 km of damaged village/rural roads were restored, meeting the PMGSY standards (original target 3,600 km, target was **not** achieved).
- 81 bridle bridges were restored (original target was 140, target **not** achieved).
- No bridle roads were completed under the project (original target was 400 km, **not** achieved). This was later dropped in the 2019 AF (see below). The Task Team clarified that the government completed all 400 km of bridle roads using their own resources.
- 8 road protection works in selected critical slopes were constructed to protect and improve connectivity (original target was 15, target was **not** achieved).

OUTCOME:

Under restoring the housing and public buildings destroyed by the disaster:

- 95.30 percent of the multi-hazard resilient housing units were constructed (baseline 0, original target 100 percent, almost achieved).
- A cumulative total of all beneficiaries under the components of this objective were 2,382 households; 1,211 villages with a cumulative population of 747,614.

Under restoring rural connectivity of communities in Uttarakhand

- 100 percent of affected villages (original target was 823 villages) had restored connectivity (baseline 0, original target 100 percent, original target achieved. The Task Team clarified that the original 100 percent target applied to restoring the connectivity of the 823 villages and that the original target was indeed justified after outputs were achieved within 3-4 months of reporting). The State adopted the improved road design standards including protection infrastructure and safety measures for all its roads.
- 9.5 percent of the labor force that worked at construction sites were women, exceeding the original target of 8 percent, from a baseline of 5 percent. This indicator was reported as an intermediate or output indicator rather than an outcome indicator.



- Unfortunately, no long-term survey was carried out to measure the number of direct and indirect beneficiaries.

The following outcomes were reported but were not part of the results framework and had no targets.

- About 2 million people benefited from increased resilience. Evidence cited decreased vulnerabilities of the infrastructure after the 2013 floods – after the 2015 flash floods, 2017 monsoon induced floods, 2019 cloudbursts and flash floods, and the 2023 Rishiganga disaster. Subsequent disasters also did not damage the houses completed in 2017
- The ICR reported that communities were engaged across all components to foster an understanding and awareness of preparedness. There was no evidence to support this claim. The ICR acknowledged the lack of outcome indicators.

Overall, the efficacy of the project to achieve the first original objective is rated Modest. The targets for the rural connectivity aspects i.e., roads and bridge roads restored were partially achieved, and no bridge roads were constructed under the project. Unfortunately, no long-term survey was carried out to measure the number of direct and indirect beneficiaries of increased rural connectivity. The targets for the outcome indicators were almost achieved but there remained moderate shortcomings because not all relevant outcomes were captured by these indicators. Most of the indicators were at an intermediate or output level. The ICR acknowledged the lack of outcome indicators and presented instead other information to serve as arguments in favor of heightened community resilience, albeit not included in the results framework.

Rating
Modest

OBJECTIVE 1 REVISION 1

Revised Objective

The objective was not revised.

Revised Rationale

The November 2019 AF added resources to restore the connectivity of the rural roads in the target community. The reconstruction of bridge roads was dropped because the government decided to finance the village roads and bridge roads with its own resources since these were simpler to implement and had lower costs. AF reduced the target for reconstructing damaged village or rural roads to finance Other District Roads (ODR) because ODRs were more technically complex, and more expensive. Targets were revised.

Revised Theory of Change: The TOC was not revised. AF provided additional inputs for the rural roads to improve the achievement of restoring the connectivity of the target communities, The number of targeted villages increased from 823 to 1,203 villages. The first component (housing reconstruction) had been completed and was not revised in terms of inputs and outputs.

Revised Inputs: Additional financing was provided for rural roads.



Revised Outputs: The reconstruction of bridle roads and some village roads were dropped and replaced by reconstructing ODRs that linked village roads to Major District Roads (MDRs), State Highways (SH), and/or National Highways (NH).

Revised Outcome: The target for restored connectivity remained at 100 percent. No changes were made to housing reconstruction since these were completed prior to the AF.

The critical assumptions were unchanged

REVISED OUTPUTS:

Under restoring rural connectivity of communities in Uttarakhand

- 1,572 km of damaged village/rural roads were restored, meeting the PMGSY standards (revised target 1,572 km, revised target **achieved**).
- 675 km of damaged ODRs were reconstructed. According to the Task Team, the AF target was 675. The target was **achieved**.
- 81 bridle bridges were restored (later redefined to include newly built or reconstructed bridle bridges, revised target was 88, with 24 financed under the original credit and 64 under the AF, then further revised to 79) The revised target was **exceeded**.
- 5 riverbank protection works were constructed in selected stretches to reduce the risk of riverbank erosions and connectivity loss (target under the AF was 5, target **achieved**).
- 8 road protection works in selected critical slopes were constructed to protect and improve connectivity (revised target was 9, further revised to 8, target **achieved**).
- Two pilot bio engineering protection measures for slope stabilization were completed, to replace the reduced target for road protection works. According to the Task Team, the original target was undefined because the AF results framework did not include this output. Implementation added this output as an innovative protection measure separate from the eight road protection measures.

REVISED OUTCOMES: No revised outcomes were reported although most of the output target indicators were achieved or almost achieved.

Overall, the efficacy of the project to achieve this first revised objective, after the AF is rated Substantial, with moderate shortcomings. The revised targets for rural connectivity were achieved. Most of the target outcome indicators were sufficient to attribute the achievement of the PDO according to the TOC although not all the indicators were at the outcome level (see Section 9 M&E below).

Revised Rating

Substantial

OBJECTIVE 2

Objective

To increase the technical capacity of the State entities to respond promptly and effectively to an eligible crisis or emergency.



Rationale

Theory of Change: The activities under this objective would enhance the capabilities of government entities such as the Uttarakhand Space Applications Centre (USAC) to plan and implement risk assessment in risk mitigation and response. A Decision Support System (DSS) was to be established. A Slope Stabilization Study was to be prepared. A multi-hazard risk assessment technical advisory group was to be financed and high-resolution satellite data was to be acquired and processed. A hydro-meteorological network and Early Warning Systems (EWS) were to be developed and implemented after reviewing the existing capabilities at the State and National levels. The third component, Contingency Emergency Response Component (CERC), was to be triggered to provide the means to efficiently recover from a disaster.

Inputs consisted of financing of studies and the training of staff to enhance the capacity of the Uttarakhand Space Applications Centre (USAC) to conduct a multi-hazard risk assessment, and conduct modeling. Other inputs included training of trainers courses, training programs, and regular drills for the emergency operations center staff and Disaster Management Officers at the District and State levels. Inputs under CERC were to include the financing of equipment and training in the use of tools and equipment procured.

Outputs were to include (i) a framework of multi-hazard risk assessment models; (ii) a hazard and loss database; (iii); and (iv) tools for the optimal use of risk information. Other outputs were to include a multi-hazard risk assessment technical advisory group, high-resolution satellite data, a GIS database, and other analytical tools for use by USAC. Other outputs were to be a DSS, an integrated user-friendly geo-spatial system, a river morphology study, a slope stabilization study, including small demonstrative works to introduce appropriate slope stabilization technology. Other outputs were the institutional organization of the USDMA, technical enhancement of the DMMC facilities. Specialized training equipment on disaster risk management included collapsed structures, medical first response, mountaineering and high altitude and water search and rescue. Outputs under the CERC were to include intensive care unit beds, test kits, and personal protective equipment.

Outcomes were to be the enhanced preparedness capacity of the staff of the USAC, the USDMA, and the technical advisory group. Evidence was to be provided by the number of departments or government entities that used the data generated by USDMA effectively.

Critical Assumption: A critical assumption was that the state government agencies and stakeholders would utilize the analytical work generated by the project toward the resilience agenda and to execute future projects. The government noted that it adopted the standards for the roads and bridges and will apply them to all future roads and bridges.

Overall, the inputs were sufficient to result in the expected outputs. However, the link between outputs and outcomes were less clear as identified under the results framework.

OUTPUTS:

- The Integrated Geospatial Platform for Disaster Risk Management (IGPDRM) was established as a simplified DSS to provide real-time risk monitoring, assist in effective disaster response, and facilitate multi-agency collaboration. This GIS database and analytical tools were installed in USAC (the original target was 100 percent; this was **not** measured and latest replaced by Yes/No which was achieved).
- River morphology study and slope stabilization study were completed **as targeted**.
- Completed all planned multi-hazard assessments, original target 100 percent, **target achieved**.



- Weather station, river gauge stations, other hydro-met recording and forecasting equipment were installed, **as targeted**.
- Sets of emergency search and rescue equipment were procured **as targeted**.

OUTCOMES:

- 18 Departments were reported to effectively use USDA information (baseline 0, original target 7, **target exceeded**). The enhanced capacity of the agencies for disaster risk management were noted to have resulted in managing their respective response to the various disasters (ICR, Annex 6, Table 6.4). For example, data informed disaster response such as in Arakot 2019, the COVID-19 pandemic, Raini 2021, and heavy rains in Kumaon 2022. The Transport Department used DRDB data to reroute traffic in cases of blocked roads. During the COVID-19 pandemic the DRDA data helped mark different containment zones. The population and various nearby emergency assets mapped in the DRA platform facilitated response planning during the pandemic.

Overall, the efficacy of the project to achieve this objective is rated Substantial. The Annex provided numerous examples of how the different departments used their improved capacity to respond to crisis, including COVID-19.

Rating

Substantial

OBJECTIVE 2 REVISION 1

Revised Objective

To increase the technical capacity of the State entities to respond promptly and effectively to an eligible crisis or emergency. The objective was not changed.

Revised Rationale

Revised Theory of Change: The TOC was unchanged. The 2019 AF provided additional resources for the technical assistance and capacity building needs for disaster risk management. Departments using USDMA generated data was increased from the original target of 7 departments to 10 departments. The October 2021 restructuring activated CERC in response to COVID-19 pandemic. Restructuring reallocated resources to CERC. The December 2021 restructuring acknowledged some cost savings and foreign exchange gains to finance additional medical equipment. CERC was triggered in response to the COVID-19 pandemic.

Revised Inputs: AF added US\$16 million to support additional training for the State Disaster Response Force (SDRF). In addition, funds were used to finance the construction of the Uttarakhand State Disaster Management Authority (USDMA) headquarters and the Emergency Operations Center (EOC) building. Financing was reallocated to CERC from components 2 under this objective and component 5 of the second objective below. Inputs also included training in the use of the equipment procured under CERC.

Revised Outputs: The 2019 AF revised the indicator regarding the installation of the GIS database and analytical tools in USAC with a Yes/No target. The buildings housing the headquarters of the USDMA, and the Emergency Operations Training Center were added.



Revised Critical Assumptions: The critical assumption above was unchanged.

REVISED OUTPUTS:

- Constructed a new SDRF training facility, the USDMA HQ, and the Emergency Operations Training Center **as targeted**.
- The GIS database and analytical tools were installed in USAC. The 2019 AF revised the indicator with a Yes/No target). The revised target was **achieved**.
- 10 female trainees participated in the training conducted by SDRF, **achieving the target** of 100 percent.
- Gender sensitive training modules were developed and delivered **as targeted**.

Under CERC:

- The state's response to COVID-19 was significantly bolstered by the CERC which was activated in response to the COVID-19 pandemic at the Government's behest aimed at acquiring intensive care unit beds, test kits, personal protective equipment.
- 40 ambulances, four CT scan machines, equipment for labs, lab technicians, and 1,650 fowler beds were procured, **all as targeted**.
- The December 2021 restructuring added another CT machine, three MRI machines, a digital radiology system, and 650 more fowler beds.
- Conducted customized training in the use of the CERC-financed machinery and equipment, **achieving target**.

REVISED OUTCOMES:

- 18 Departments used USDA information (baseline 0, revised target 10, **target exceeded**).
- The 2019 AF noted that an external evaluation was to assess the ability of the departments to make use of the information, but the ICR reported that **no assessment was done** (ICR, paragraph 31).

Under CERC:

- On average, 20,488 people benefited monthly from the use of CERC procured equipment, (the original target was an average of 15,000 monthly beneficiaries). The ICR notes that the CERC surpassed its beneficiary goal, assisting over 600,000 individuals between October 2020 and September 2021. The target was **exceeded**.

The following were reported but were not part of the results framework and had no targets.

- The USDMA and the District Disaster Management Authority used risk data to increase resilience evident in their response to the 2019 and 2023 disasters and the COVID-19 pandemic.
- The World Bank's 2021 Resilience Rating System rated this project "A minus." This meant that transformational activities such as the establishment and equipping of USDMA and the SDRF set the foundation for increasing disaster management and resilience in the future.



Overall, the efficacy of the project to achieve this first revised objective, after the AF is rated Substantial. Most of the target outcome indicators were sufficient to attribute the achievement of the PDO according to the TOC although not all the indicators were at the outcome level (see Section 9 M&E below). Cases were presented to justify how relevant agencies used the data generated by USDMA to achieve this objective. The CERC was triggered to respond to the COVID-19 emergency and achieved the desired results.

Revised Rating
Substantial

OVERALL EFFICACY

Rationale

ORIGINAL OVERALL EFFICACY: The overall efficacy of the project to achieve the original PDOs against the original targets is rated Substantial with moderate shortcomings. Most of the original target outcome indicators were almost achieved but there remained moderate shortcomings because these were at an intermediate or output level and not all relevant outcomes were captured by these indicators.

- For the original objective 1, the efficacy of the project is rated modest because the original target output indicators especially related to the rural connectivity were not achieved even as the original outcome indicator was noted to have been achieved using the original number of target communities.
- For the original objective 2, efficacy is rated Substantial with moderate shortcomings because the original outcome indicator did not sufficiently address the outcome of the project inputs and outputs to enhance capacity.

The overall efficacy of the project to achieve the first and second objectives using the original targets is rated **Substantial with moderate shortcomings..**

Overall Efficacy Rating

Substantial

OVERALL EFFICACY REVISION 1

Overall Efficacy Revision 1 Rationale

REVISED OVERALL EFFICACY: The revised overall efficacy of the project to achieve the revised first and second objectives are both rated Substantial with moderate shortcomings because of the lack of some relevant outcome indicators to support the achievement of the objectives.

- For the first revision of objective 1 to acknowledge the AF, the efficacy of the project to achieve this first revision is rated Substantial with moderate shortcomings. Output and outcome indicators that



were attributed to the inputs and outputs were substantially achieved, though the outcome indicators for resilience could have been better defined and measured.

- For the first revision of objective 2, efficacy is rated Substantial because the outcome indicators including the beneficiaries of CERC was substantially achieved.

The overall efficacy of the project to achieve the PDOs against revised targets is rated **Substantial**.

Overall Efficacy Revision 1 Rating

Substantial

5. Efficiency

Economic and Financial Efficiency: At appraisal, an economic analysis assessed the rate of return of capital investments under the original project. A similar economic analysis was conducted during the appraisal of the AF. Investments included disaster-resilient permanent housing, public buildings, and rural roads and bridges. The analysis considered US\$187 million dollars (or about 83 percent) of the original total project costs and another US\$85 million (or 74 percent) of the AF. The average EIRR at AF was 51.8 percent with the NPV ranging from US\$732.2 million to US\$1,470.3 million and a benefit cost ratio (BCR) in the range of 10.9 to 18.4 using the discount rates of 10 percent for the rural roads connectivity/agriculture component and 5 percent for the capacity building/tourism component. The economic efficiency analysis did not include the contingent emergency expenditure for COVID-19. Benefits from the resilient infrastructure reconstruction included lives saved from future disasters, quantifiable economic gains or avoided or minimized earnings losses in the tourism and agriculture sectors from reduced road and bridge closure disruptions. Rural road connectivity was to benefit the transport of agricultural products to markets and accelerate growth in international and domestic tourism. Overall, the project maintained a benefit-cost ratio (BCR) in the range of 10.6 to 16.7 at the discount rates of 10 for the agriculture component and 5 percent for the capacity building/tourism component, respectively.

At closing, the economic analysis followed both methodologies, the first used at the appraisal of the original project, which did not include the use of the economic internal rate of return (EIRRs) and net present values (NPV) of the project; and the second used at the appraisal of the AF. At closing, the average EIRR for the project was 56.0 percent with the NPV in the range of US\$2.2 to US\$4.2 billion. The average BCR at the appraisals was 10.0 for both the original project and the AF. Exchange rate gains led to savings during implementation and slightly increased the level of economic efficiency at closing.

Administrative and Operational Efficiency: The Project Management Unit (PMU) under the Uttarakhand State Disaster Management Authority (USDMA) implemented this project. The project implementation units (PIU) of key departments such as the Bridge, Ropeway, Tunnel, and Other Infrastructure Development Corporation of Uttarakhand Limited (BRIDCUL), and the Public Works Department (PWD) implemented specific activities under their respective remits. The PMU was also the PIU for sub-components related to capacity building. The project established a new PIU under the Department of Health to implement CERC. Reliance on seasonal labor, rugged terrain, and harsh weather in Uttarakhand challenged the pace of implementation but strategic decisions mitigated these to generate to long-term value and resource efficiency. These decisions included reallocating resources from less costly materials, narrow, unpaved, steep, and unstable village roads to ODRs. The more



economical, shorter span truss bridges in targeted locations replaced longer span, more costly suspension bridges. The cumulative 36-month extension of the project period included 18 months due to COVID-19, the other months to accommodate delayed completion of construction works (see Section 10 Other Issues, Procurement below). US\$19.21 million was cancelled at closing or about 6 percent of total commitments. The government committed US\$24 million in the AF (20 percent of total costs, except for the CERC component) and disbursed US\$20.2 million at closing.

The project's overall efficiency is rated Substantial. Comparing EIRRs at appraisal and closing was not feasible because the economic efficiency at appraisal only used cost-benefit analysis and not EIRRs.

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:

	Rate Available?	Point value (%)	*Coverage/Scope (%)
Appraisal		0	0 <input type="checkbox"/> Not Applicable
ICR Estimate		0	0 <input type="checkbox"/> Not Applicable

* Refers to percent of total project cost for which ERR/FRR was calculated.

6. Outcome

The relevance of objectives is rated **High**. The efficacy of the project to achieve the first and second objectives is rated **Substantial** with moderate shortcomings before restructuring and Substantial after restructuring. The efficiency of the project is rated **Substantial**. The overall outcome is rated **Satisfactory** based on the **split rating** below:

	Original	After the 2019 AF
Relevance of Objectives	High	
Efficacy of the Project to achieve		
Objective 1	Modest	Substantial
Objective 2	Substantial with moderate shortcomings	Substantial
Overall Efficacy	Substantial with moderate shortcomings	Substantial
Efficiency	Substantial	
Outcome Rating	Moderately Satisfactory	Satisfactory
Value of Outcome Rating	4	5
Amount Disbursed (in US\$ millions)	144.44	319.12-144.44=174.68



Disbursement Rate (in percent)	$144.44/319.12 = 45$	$174.68/319.12 = .55$
Weight Value	$4*0.45 = 1.8$	$5*0.55 = 2.74$
Total Weights	1.8	2.74
Overall Outcome	4.54	rounded to 5 Satisfactory

a. Outcome Rating
Satisfactory

7. Risk to Development Outcome

The following pose risks to development outcome:

- **Environmental Risk: Exposure to environmental and natural disasters:** This is a high risk. The region remains vulnerable to natural hazards. The project reconstructed housing units, public buildings, roads, and bridges that were designed to withstand or minimize the impact of the threats from recurring natural hazards or disasters. The state agencies and communities collaborated on the planning of these investments to emphasize community participation in the adoption of resilience measures. An institutional framework for disaster risk reduction is in place. A follow-on project would mitigate this risk by further strengthening the institutions that deal with disaster resilience.
- **Financial Risk: Lack of financing for operations and maintenance (O&M).** This is a moderate risk. Technological and analytical interventions enhanced the disaster response capacity of state institutions including the USDMA and put in place the enabling environment for disaster risk reduction in Uttarakhand. These advancements require financing for operations and maintenance including for those completed investments in housing and rural connectivity infrastructure. To mitigate this risk, the government has agreed to a follow-on operation, U-PREPARE.
- **Technical risks:** This is a moderate risk. The technologies, tools, and equipment introduced under this project would require periodic updating. The follow-on project may include measures to mitigate this risk.
- **Ownership Risk: Social, including stakeholder support.** This is a moderate risk. There is a risk that community participation in the various aspects of designing disaster resilient housing units and public buildings may not be sustained over time. Strengthening ownership by the communities on their roles in disaster resilience may be mitigated by their participation in future projects like the follow-on project, the availability of the Grievance Redress Mechanisms required in Bank-financed projects, and the continued commitment of the state to raise awareness in disaster risk reduction.

8. Assessment of Bank Performance

a. Quality-at-Entry

The World Bank Team designed this project as an emergency operation in response to the June 2013 Uttarakhand floods. The Board approved the project based on the first findings of the multi-sectoral team that conducted a joint damage and loss assessment prepared by the World Bank, with the Asian Development Bank, and the United Nations. Scope, costs, and targets were to be finalized during



implementation. The World Bank team designed this project as a collaborative initiative to complement the state government's restoration program and the Asian Development Bank's Uttarakhand Emergency Assistance Project (UEAP). Reconstruction components were distributed among the three entities. An Investment Project Financing (IPF) was the right instrument to address the capital needs of reconstructing resilient infrastructure. Technical assistance was to enhance capacity. Design included retroactive financing of urgent disaster response activities to reopen critical roadways and facilitate evacuation. The World Bank team incorporated lessons from other similar World Bank-financed disaster response and recovery projects and complemented physical infrastructure replacement investments with strengthening capacity and building institutional systems; incorporating standards to make transport connectivity infrastructure resilient against future similar events; and enhancing capacities of communities to participate in disaster reduction for effective DRM, particularly in the mountainous and hard-to-reach areas like Uttarakhand. The World Bank team designed an institutional arrangement to mitigate implementation readiness risks and included innovative direct flow of funds. The PMU had overall coordination among various departments and agencies. Specific PIUs were created in the respective departments to implement housing, roads, and bridges. The Technical Assistance and Capacity Building for Disaster Risk Management (TACBDRM) PIU was to focus on strategic aspects of the infrastructure investments. Procurement and safeguards training and including capacity building as a project component were to mitigate the risks of safeguards compliance and readiness to implement. The design included CERC as a standby to mitigate environmental risks and future disasters. The scope was well defined and was to be limited to reconstruction, restoring connectivity, and enhancing technical capacity. The results framework and M&E design were inadequate to measure post-disaster recovery investments. However, only qualitative measures were to provide evidence for community resilience. The Task Team clarified that strengthening community participation was limited to addressing the needs of owner-driven housing reconstruction process (e.g., local masons trained in safe and disaster resilient construction, awareness raising in addressing grievances, and the benefits of female-headed homeownership), but these were not measured as part of building resilience. Measuring the resilience of investments and those of the target community remained unaddressed in the restructurings or AFs (see Quality of Supervision below).

Overall, the quality of the Bank team's performance at entry is rated Satisfactory with minor shortcomings. The inputs and outputs were designed to achieve the objectives. The complex capacity needs of the implementing entity were sufficiently addressed. The government committed 20 percent in counterpart funds for the AF and lessons learned were adapted to the project's design. Not all the indicators in the results framework provided evidence of the outcome of the inputs and outputs toward the resilience of the infrastructure investments and its impact on beneficiaries (see Section 9 on M&E Design below).

Quality-at-Entry Rating Satisfactory

b. Quality of supervision

The World Bank team conducted 21 missions over the project period, including virtual ones during the COVID-19 pandemic. Task team leaders and key staff changed several times throughout implementation. The task team used in-country staff and experienced consultants to deliver training and timely advice to government officials as corrective measures to implementation challenges. Adequate inputs in supervision



and fiduciary aspects were evident in the use of a comprehensive, multi-layered MIS (including advanced tools such as CCTV and drones) to identify sources of delays and facilitate decision-making using details from various procurement packages. The real time MIS data verified completed works, released payments, informed all stakeholders, and led to a completion of the housing component ahead of schedule by May 2017. The World Bank team reviewed and approved procurement plans, contracts, conducted post procurement reviews, and assisted in various technical evaluations to ensure compliance with safeguards. Shortcomings were resolved satisfactorily, such as imposing penalties when contractors were delayed. Initial reviews of design and Detailed Project Reports (DPRs) for roads and bridges, and contract management were outsourced to supplement nascent staff capacity. Capacity improved over time. The World Bank team facilitated the adherence to updated codes and standards (especially for roads and bridges), resilience, and disaster preparedness across sectors and departments. The World Bank team emphasized and enabled integration of technology-based solutions and encouraged engaging with both national and international specialized agencies. The World Bank team also organized trips to visit Kerala and Odisha State Disaster Management Authorities to inform the design of the USDMA. Quality and reliability of data were ensured through improved compliance and feedback systems, coupled with targeted training for stakeholders. Design fostered gender inclusivity and community engagement. The logistical challenges posed by the state's geography, such as transporting heavy materials to remote areas with rugged terrain, a lack of contractor capacity or interest for bids for certain road works, primarily due to the project's complexity, small scale, and remoteness caused delays. The Bank team organized contractors' conclaves and workshops in Delhi and Uttarakhand to generate interest. The COVID-19 pandemic and subsequent lockdowns slowed operations. Surging international steel prices, labor shortages, shipping delays for essential materials, contributed to the delays and led to extensions of the project period. In addition, natural disasters like the Rishiganga flooding in February 2021 also called for emergency response, required urgent repairs and resources, diverted attention, and further delayed the project. A follow-on operation - the Uttarakhand Disaster Preparedness and Resilience Project (U-PREPARE or P179749) is in place.

Overall, the Bank team's performance at supervision is rated Satisfactory with minor shortcoming. Lack of outcome indicators to reflect the resilience achieved by the infrastructure investments, and the enhanced capacity of stakeholders to respond to disasters and contribute to the resilience of local communities indicated a minor shortcoming since this was an emergency recovery project. The ICR acknowledged this shortcoming (ICR, paragraph 28). The Bank team missed the opportunity during the various restructurings and the AF to address this shortcoming.

Overall, the Bank performance at entry and at supervision are both rated Satisfactory.

Quality of Supervision Rating

Satisfactory

Overall Bank Performance Rating

Satisfactory

9. M&E Design, Implementation, & Utilization



a. M&E Design

The components - housing and rural connectivity - would contribute to the PDO of building resilience in the affected communities and the institutions of the state to respond, reconstruct and recover. The identified indicators did not encompass all expected outcomes of the PDO statement. For example, there were no outcome indicators to measure improved disaster resilience. The ICR did acknowledge this shortcoming - lack of outcome indicator to measure resilience of communities (ICR, paragraph 54). Nonetheless, intermediate results indicators did adequately capture their contributions to achieving the expected outcomes. These indicators were specific, relevant, measurable, achievable, and time bound. Baselines and targets were available for all indicators. The M&E design also included the MIS system that provided real time data and used the latest technology to enrich the M&E system in place. Admittedly, the institutional location of the M&E system was nascent and still evolving.

b. M&E Implementation

The Project Management Unit under the USDMA implemented the M&E system as designed using advanced GIS-enabled MIS tools, which provided multiple layers of oversight, including a high-level MIS dashboard to inform strategic management decisions and numerous localized monitoring modules. These included tools designed specifically for compliance with the labor laws, and the technical PRIMAVERA platform for public buildings. Both the PMU and PIUs were well-equipped with advanced tools such as CCTV, drones, and digital monitoring systems and used these to monitor the implementation of contractors' works. PIUs conducted frequent field visits. Periodic reports were completed and disseminated. The indicators in the results framework, including changes in targets were measured, reported, and adjusted as needed. The project implemented an MIS that caught challenges early, informed the decision-making of corrective measures to resolve these for effective M&E implementation.

c. M&E Utilization

M&E data was used to facilitate real-time tracking, inform management decisions, and course correction, as needed, across various stakeholders. The PIU prepared detailed housing reconstruction reports, but no similar reports were prepared for the connectivity component. The M&E mechanisms adequately addressed implementation challenges including the efficient tracking and resolution of grievances, supported by online documentation. M&E data was used to inform shifts in the direction of the project implementation, including reducing targets as CERC was activated or revising sub activities such as replacing village and bridge roads with other district roads for efficiency. Strong feedback mechanisms to show raising awareness among citizens who provided feedback using multiple media were reflected in the 101 consultations conducted exceeding the target of 12. For example, the PMU issued completion certificates only after all relevant project requirements (including safeguards) were verified completed. In another, the average monthly beneficiaries under the CERC were initially misreported but later corrected with more accurate figures. The M&E data was used to provide evidence supporting project outcomes except for missing outcome indicators that were noted that did not fully capture all outcomes attributable to the project interventions (see Design above). The M&E functions under the project informed the design of the M&E system in the follow-on project - the Uttarakhand Disaster Preparedness and Resilience Project (UPREPARE or P179749).



Overall, the M&E design, implementation, and utilization is rated Substantial with moderate shortcomings in the lack of indicators to fully capture the expected project outcomes.

M&E Quality Rating

Substantial

10. Other Issues

a. Safeguards

Environmental Safeguards: The project was assigned an environmental safeguard category "B" requiring partial assessment. The project triggered the following safeguards: Environmental Assessment (OP) (BP 4.01), Natural Habitats (OP) (BP 4.04), and Forests (OP) (BP 4.36), subprojects were mostly categorized as Environmental Assessment Category "E2," or less sensitive and called for the preparation of Environment management plans (EMPs). Regular environmental and social audits and environmental and social modules in the MIS supported compliance with the environmental safeguards (ICR, paragraph 58). Regular environmental and social audits and MIS equipped with environmental and social modules for monitoring. To comply with OP/BP 4.04 (Natural Habitats), the project avoided significant conversion or degradation of natural habitats through careful planning. Preventing harmful impacts on forests and natural habitats confirmed compliance with OP/BP 4.36 (Forests). Safety protocols during the COVID-19 pandemic heightened focus on health, safety protocols, and waste and debris management. The active involvement of the community and stakeholders and dedicated environmental staff was a marked achievement, complemented by the introduction of innovative bioengineering pilots. Road and bridge construction were reported to stringently follow environmental and social safeguards, considered material durability, and enhanced road resilience.

Social Safeguards: The project triggered the following social safeguards: Physical Cultural Resources (OP) (BP 4.11) and Involuntary Resettlement (OP) (BP 4.12) Social. The project provided detailed social assessments and prepared Resettlement Action Plans (RAPs) for affected families. The project complied with the World Bank's OP/BP 4.12 on Involuntary Resettlement and OP/BP 4.11 on Physical Cultural Resources (ICR, paragraph 59). The project deployed an ICT labor compliance tool for real-time granular data. The Social Management Plan improved conditions for 30,091 laborers with 210 health camps, regular health checkups, and public consultations. Initial noncompliance with the Resettlement Framework, land acquisition issues, lack of staff, and an unfortunate fatality were early implementation challenges but were eventually resolved. Community outreach benefited the grievance mechanism. All 832 grievances were resolved. 168 affected families received resettlement compensation. The 9.5 percent female labor force participation was significant but pointed to the need for broader gender inclusion in professional roles. 681 people participated in training sessions on safeguards compliance.

b. Fiduciary Compliance

Financial Management: The project's unique approach to the flow of funds, reporting, and risk management mechanisms followed the World Bank's financial management policies (ICR, paragraph 60). This project used a bank fund flow, releasing funds directly to the PMU (to a special account in a



commercial bank) before allocating these to field PIUs. Minor financial challenges, such as shortages of funds in divisions of the Public Works Department and issues related to contract variations and retention money, were identified, and resolved. Project staffing was reported adequate with no observed skill deficiencies reported. All interim unaudited financial reports were submitted in a timely manner. The task team confirmed that external auditors had no qualified opinions on all audits.

Procurement: Initial contract management as the implementing agency was only beginning to boost its capacity and the subsequent delays in 2020 brought by the impact of COVID-19 challenged initial procurement performance. Procurement capacity of PIUs itself improved over time. The World Bank task team conducted training workshops and assisted PIUs to address procurement related challenges through post procurement reviews, approving procurement plans, contracts, and assisting in technical evaluations. and enhanced the MIS system to address delay choke points, for example, imposing penalties in case of delays to contractors (see Section 9 M&E Implementation above). Contract management issues included time overruns, variations in contract amounts, and expired/invalid contracts. Causes of failed bids were analyzed, technical specifications were reviewed, and lessons from past projects were adopted to enhance procurement and contract management capacity. The Procurement Plan was implemented using a Procurement Plan Execution System and then the Systematic Tracking of Exchanges in Procurement (STEP) system.

c. Unintended impacts (Positive or Negative)

d. Other

11. Ratings

Ratings	ICR	IEG	Reason for Disagreements/Comment
Outcome	Satisfactory	Satisfactory	
Bank Performance	Satisfactory	Satisfactory	
Quality of M&E	Substantial	Substantial	
Quality of ICR	---	Substantial	

12. Lessons

The operations offered the following lessons:

- **If relevant indicators to measure expected outcomes are lacking, a project misses the opportunity to demonstrate, measure, and report on positive achievements at outcome level.** In this project, reconstruction of housing units was used to provide evidence of community resilience. Indicators supported the physical infrastructure investments that



were completed to show recovery and resilience of communities. However, indicators or benchmarks for the other dimensions of resilience were lacking. Communities could have used these benchmarks to track progress and suggest areas for improvement. Surveys, geospatial data to map and predict community vulnerabilities, community feedback mechanisms could also inform the assessment of community resilience. Some of these data were available, but not captured. Projects focusing on increasing resilience of communities may benefit from using both quantitative and qualitative assessments for a more complete view of a community's capacity to prepare, respond, and recover from disasters.

- **Training end users in line departments in the use of sophisticated analytical studies, tools, and technologies may lead to more effective use of such tools.** In this project, adopting the MIS was a significant step in strengthening institutional M&E capacity. However, end users were not given sufficient training to build capacity to optimize the potential uses of such tools. Training end users in line departments, may lead to more effective use of these tools or lead to discovery of other uses to enhance the capacity of line agencies in early warning and hydro-met systems. Projects that introduce advanced tools and systems, may benefit from involving the staff of the department that will use the technology and facilitate their effective use, through user feedback and last-mile connectivity in the use of early warning system. This may also foster inter-agency collaboration for timely and informed decision-making because comprehensive data is now available to all stakeholders.
- **A holistic approach to resilience that considers the interconnected infrastructure elements can effectively address system-wide vulnerabilities and enhance overall durability.** In this project, infrastructure investments consisted of interconnected parts where each element was expected to contribute to overall resilience. For roads, the project integrated resilient materials. Adequate drainage systems prevented waterlogging and damage. For bridges, the approach roads and surrounding areas play a significant role in overall functionality and resilience of the structure itself. This broader vision ensures that vulnerabilities are not overlooked. The World Bank's involvement added value in improved design standards. Updated guidelines and safety measures are now adopted for other roads in the state.
- **Innovative approaches, such as gender-focused homeownership, and resilient construction techniques, can facilitate more sustainable building practices and operational efficiency in disaster management.** In this project, the owner-driven, gender-focused housing construction approach demonstrated tangible benefits. For example, beneficiaries received funds in joint accounts to promote equitable decision-making. Another example was the design of the technically advanced USDMA building to be earthquake-proof with seismic bearings (called base isolators) and a strong commitment to environmental sustainability by receiving a Green Rating for Integrated Habitat Assessment (GRIHA) 4-star green building rating. This GRIHA rating is derived from receiving 51 to 60 percent of applicable points in energy efficiency, waste management, and sustainable material use. The SDRF training center is the biggest search and rescue training center in North India. The project also introduced innovative bridge construction techniques, marking the debut of the prefabricated modular steel bridge in the state. The project conducted bioengineering pilots that had the potential for wider adoption.

13. Assessment Recommended?



No

14. Comments on Quality of ICR

The ICR outlined a clear picture of the project operations, was internally consistent and results oriented. The report followed the guidelines. The narratives supported the ratings. The presentation of how the project interventions resulted in enhancing community resilience was somewhat unclear and reinforced the misalignment of the outcomes and outputs in the TOC created for the ICR. The theory of change outlined the causality between inputs and outputs and revealed gaps in the outcome indicators. The evidence was clearly laid out and the quality of the analyses linked the evidence to the findings. The annexes elaborated on the various adjustments made in the operations, particularly regarding the activation of the CERC. Together with the annexes, particularly Annex 6, the report expanded on the project's achievements.

Overall, the quality of the ICR is rated Substantial.

a. Quality of ICR Rating
Substantial