



1. Project Data

Project ID

P143382

Project Name

IN: TN Puducherry DRR

Country

India

Practice Area(Lead)

Urban, Resilience and Land

L/C/TF Number(s)

IDA-52790

Closing Date (Original)

31-Jul-2018

Total Project Cost (USD)

163,449,394.04

Bank Approval Date

20-Jun-2013

Closing Date (Actual)

30-Jun-2020

IBRD/IDA (USD)
Grants (USD)

Original Commitment

236,000,000.00

0.00

Revised Commitment

173,255,783.43

0.00

Actual

163,449,394.04

0.00

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2. Project Objectives and Components

a. Objectives

The project development objective (PDO) as stated in the Financing Agreement and in the Project Appraisal Document (PAD) is "to increase the resilience of coastal communities in Tamil Nadu and Puducherry to a range of hydro-meteorological and geophysical hazards along with improving project implementing entities' capacity to respond promptly and effectively to an Eligible Crisis or Emergency."

In this review, the PDO is assessed in two parts, namely "to increase the resilience of coastal communities in Tamil Nadu and Puducherry to a range of hydro-meteorological and geophysical hazards" and "to improve



project implementing entities' capacity to respond promptly and effectively to an Eligible Crisis or Emergency". These two separate parts of the PDO are referred to as Objectives 1 and 2 in Section 4 below. This is in line with the approach used in the ICR.

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

No

c. Will a split evaluation be undertaken?

No

d. Components

The project had the following five components:

Component 1: Vulnerability Reduction (cost at appraisal: US\$224.6 million, including contingencies; at project close: US\$150.3 million). It included the following three subcomponents:

Subcomponent 1.1 Resilient Housing, for Tamil Nadu, to complete the construction of about 14,400 multi-hazard resilient permanent houses in 11 coastal districts started in the Emergency Tsunami Reconstruction Project (ETRP). The component was also to provide relocation benefits during the period of house reconstruction and a 10-year house insurance against natural hazards. For Puducherry, it was to complete the building of about 1,450 owner-built multi-hazard resilient permanent houses and 300 houses built through a contractor under the ETRP and to rebuild about 1,000 new multi-hazard resilient houses to replace the thatched/temporary roof houses in vulnerable areas.

Subcomponent 1.2 Evacuation Shelters, Routes and Early Warning Systems, for Tamil Nadu, to construct about 120 multipurpose evacuation shelters, install about 440 early warning systems, and lay out evacuation routes with signage. For Puducherry, subcomponent 1.2 Restoration of Government Buildings, Bridges and Culverts, was to strengthen and rehabilitate existing public infrastructure, such as the Town Hall, other similar public buildings, and old existing bridges, and to rebuild culverts. These works were to make the existing infrastructure multi-hazard resilient and help restore the heritage of Puducherry.

Subcomponent 1.3 Cyclone Resilient Electrical Network, for Tamil Nadu, to lay the underground electrical network in Cuddalore (high tension (HT) - 162 km; low tension (LT) - 512 km) and Nagapattinam (HT - 250 km; LT - 60 km) towns and, for Puducherry, to replace overhead lines with underground cables (900 km) to reduce power losses and the time for restore the service.

Component 2: Sustainable Fisheries (cost at appraisal: US\$82.0 million, including contingencies; at project close: US\$60.2 million). It included the following two subcomponents:

Subcomponent 2.1 Fishing Infrastructure, for Tamil Nadu, to reconstruct and modernize a fishing harbor and create permanent stability for coastal inlets to improve fishing communities' access to the sea and, for Puducherry, to complete the provision of fishers work shelters and modernize fishing harbors and fish markets started under the ETRP.

Subcomponent 2.2 Fisheries Management for Sustainable Livelihood II, for Tamil Nadu, to implement local reform processes to support improved performance in the marine fisheries sub-sector aimed at more



sustainable flows of social and economic benefits to coastal fisheries communities and a healthy marine environment, provide a wireless communication system for the safety of fishers at sea, and establish linkages with the Global Environment Facility's Bank-implemented Areas Beyond National Jurisdiction, Bank-led Global Partnership for Oceans Program, and the Food and Agricultural Organization's Technical Cooperation Program and coordination and governance mechanisms to provide technical support to implement the activities to the Fisheries Department's project implementation unit (PIU). For Puducherry, it was to finance activities complementary to and coordinated with Tamil Nadu.

Component 3: Capacity Building in Disaster Risk Management (DRM) (cost at appraisal: US\$12.4 million, including contingencies; at project close: US\$4.4 million). In Tamil Nadu, it aimed at strengthening the capacity of government institutions, civil society, the school education system, and coastal communities through the four subcomponents to (i) strengthen the State Disaster Management Authority, (ii) strengthen the Community Based Disaster Risk Management (CBDRM) program, (iii) develop the curricula on disaster risk reduction for schools and training institutions, (iv) complete the preparation of the Integrated Coastal Zone Management (ICZM) plan, train stakeholder on coastal zone management, and erect high tide line pillars across all 13 coastal districts. For Puducherry, it included (v) expanding and integrating the emergency operation center with a decision support system for disaster response planning, (vi) strengthening the capacity of the Fire Service with modern equipment and training, and (vii) supporting a CBDRM program. In addition, (viii) development of maps demarcating the high tide line was also to be undertaken.

Component 4: Implementation Support (cost at appraisal: US\$18.2 million, including contingencies; at project close: US\$18.7). For Tamil Nadu, it was to finance incremental operating costs, operating costs of the Project Management Unit (PMU) and the PIUs in the line departments, and consultancies required for the preparation and supervision of specific activities, trainings, exposure visits and knowledge exchange programs. For Puducherry, it was to finance the operating cost of the Project Implementation Agency, the department-level PIU, and for external consultancies required to prepare and supervise specific activities, including training, exposure visits, and knowledge exchange programs.

Component 5 - Contingent Emergency Financing for both Tamil Nadu and Puducherry (cost at appraisal: US\$0 million; at project close: US\$0 million). This was a zero-cost component to enable the government authorities to request to the Bank to re-allocate project funds to respond to an eligible emergency situation.

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

Project Cost:

The actual total project cost was US\$233.5 million, which is 69 percent of the appraisal cost estimate of US\$337.2 million (ICR, Annex 3). The significant lower project cost is due to saving mainly under the resilient housing construction subcomponent, which according to the Bank task team came from more efficient designs and lower bid prices. The Bank task team, in the same discussion on January 5, 2022 (note: all references to discussions between the Bank task team and IEG in this ICRR refer to this date), also mentioned to IEG that the cost saving under the underground electricity cabling subcomponent and the fisheries component were due to lower bid prices and a reduced project scope.



Financing:

The Bank was expected to contribute US\$236.0 million to the cost of the project through an IDA credit. The Bank disbursed US\$163.4 million, which is 69 percent of the credit amount.

Borrower Contribution:

The expected borrower contribution at appraisal was US\$101.2 million. The actual contribution was US\$70.0 million, which is 69 percent of the appraisal estimate.

Dates and Project Restructuring:

The project was approved on June 20, 2013, became effective on January 29, 2014, and was expected to close on July 31, 2018. The closing date was extended twice, in July 2018 for 20 months, and in March 2020, for three months. The actual closing date was June 30, 2020. The 2018 extension was necessary to provide the recipient with more time to implement the project activities, especially the underground cable installation and the early warning system, which were delayed due to contract award and work implementation delays (Restructuring Paper (RP), page 3) caused by lack of experience of some project implementation agencies, delays in finding sites for evaluation shelters, and frequent natural disasters, which took away the attention of the implementation staff from the project (ICR, paras 74 to 76). The 2020 extension was necessary to enable the recipient to request a project restructuring to use the undisbursed funds and determine the priorities to support the COVID-19 response (RP, page 4).

On June 30, 2020, the last day of credit effectiveness, the project was restructured to (i) reallocate IDA funds from Component 1 to the Contingent Emergency Financing Component 5 to support COVID-19 response efforts, (ii) change the IDA financing percentage from 70 percent to 100 percent to retroactively cover project expenditures from the credit signing date, (iii) include Tamil Nadu Medical Services Corporation Limited as an additional implementing agency and PIU for COVID-19-related activities to be financed under Component 5 in Tamil Nadu, (iv) cancel SDR9.52 million of the IDA credit, which were not expected to be used, and (v) change the results framework to adapt it to the reality on the ground.

The changes to the results framework included a slight revision of the following two intermediate results indicators: "*Number of villages covered in CBDRM program*" was changed to "*Number of habitations covered in CBDRM program*" and the respective target was increased from 150 to 560, and "*Establishment of a Centre for Disaster Management*" was changed to "*Establishment of a Centre for Disaster Management (Tamil Nadu)*". They also included (i) adding two new intermediate results indicators, i.e. "*Roads rehabilitated, rural*" and "*Sub-projects with post-project community engagement or O&M arrangements, including Sub-projects that are expected to have a mechanism for post-completion operation*" and (ii) adjusting all indicator targets to the closing date of June 30, 2020. Finally, the results framework change included an increase of the end target of the intermediate results indicator "*Number of early warning systems installed*" from 439 to 450 units and reduced the end targets of the two intermediate results indicators "*Evacuation Routes laid*" from 44 to 41 km and "*Number of resilient houses reconstructed*" from 16,000 to 14,649 units. Because two of these changed targets form the numerator for the PDO indicators "*Percentage of coastal population covered by the early warning systems*" and "*Percentage of households with Quality certified multi-hazard resilient houses*", the results framework change increased the level of ambition of the indicator "*Percentage of coastal population covered by the early warning systems*" by 3 percent and decreased the level of ambition of the "*Number of resilient houses reconstructed*" by 8 percent.



The Bank task team explained to IEG that at the June 2020 restructuring, the Bank decided not to extend the project closing date and that the government did not complete the restructuring, therefore the project did not finance the COVID-19 response (ICR, para 21).

Split rating: Despite the minor lowering of the level of ambition for one PDO indicator, no split rating is applied and the project is assessed based on the original targets because the indicator target revision took place on the last day of the credit validity, so an assessment against the revised target would make no practical difference.

3. Relevance of Objectives

Rationale

Context at Appraisal. At appraisal in 2013, India was highly vulnerable to natural hazards, particularly earthquakes, floods, droughts, cyclones, and landslides. Studies indicated that natural disaster losses equated up to 2 percent of India's gross domestic product. Tamil Nadu was the seventh most populous state in India with a total population of 72 million, 50 percent of which lived in coastal districts. The various economic activities along the coast, including fishing, agriculture, tourism, shipping, and industry, were important drivers of the overall state economy. Similarly to Tamil Nadu, about two-thirds of the population in the districts of Puducherry and Karaikal, which make up 76 percent of the total population of the Union Territory of Puducherry, lived in densely packed urban settlements along the coast and obtained their revenues from fisheries, agriculture, tourism, and the service sectors. The coastal populations and economic assets of these states were prone to multiple hazards, including high frequency and intensity of cyclones, storm surges, coastal floods and tsunamis. These events not only caused human death but also economic damage from loss of livestock, fisheries, crops, and houses. Both Tamil Nadu and Puducherry had established mechanisms to respond to disasters for immediate relief and long-term reconstruction but lacked disaster risk mitigation and preparedness to reduce the overall impact of disasters. With climate change and variability becoming worse, at project close, the proneness to hydro-meteorological and geophysical hazards continued and likely increased.

Previous Sector Experience. At appraisal, the Bank had been assisting India in effectively responding to disasters for over a decade (PAD, para 4). In the aftermath of the Indian Ocean Tsunami of December 26, 2004, the Bank approved the India - Emergency Tsunami Reconstruction Project for Tamil Nadu and the United Territory of Puducherry. The objective of this project was to revive livelihoods and promote recovery in Tsunami affected areas. It mainly focused at the reconstruction of houses, and through a restructuring, the project included a vulnerability reduction of coastal communities component. This was the first major risk reduction initiative in the region. The Bank had also supported the Fisheries Management for Sustainable Livelihoods technical assistance project that developed a policy framework, vision, strategy, and institutional capacity in Tamil Nadu and Puducherry for more effective management of marine fisheries.



Relevance to Government Strategies. At appraisal, the PDO was in line with India's commitment to DRM and its DRM framework already in place, consisting of the 2005 Disaster Management Act, the National Disaster Management Authority, and the State Disaster Management Authorities. The National Disaster Management Authority had been active in formulating guidelines and procedures for dealing with specific natural disasters and was mandated to issue policies, plans, and guidelines for DRM.

Relevance to Bank Assistance Strategies. At appraisal, the PDO was in line with the second pillar "Ensuring Development is Sustainable" of the Bank's FY09-FY12 India Country Partnership Strategy (CPS), which stated that the "World Bank Group's assistance would help reduce the burden that environmental degradation imposes on the population, particularly vulnerable groups" and "increase the resilience of people and the economy to nature-related and man-made shocks." It aimed at "supporting India's comprehensive efforts to reduce the country's vulnerability to floods, cyclones, earthquakes and other natural perils." The PDO was also in line with the Bank's FY12-15 CPS for India, which under the "Inclusion objective" aimed at assisting in promoting human development and strengthening social programs that support more inclusive growth with emphasis on enhanced coastal DRM systems. At completion, the PDO remained in line with Bank's FY18-FY22 Country Partnership Framework for India. It directly contributes to Objective 1.5 Improve Disaster Risk Management under the focus area of "promoting resource-efficient growth and poverty reduction."

The PDO, however, did not fully adequately reflect the fisheries-related project activities and outcomes. According to the PAD, para 18, these activities aimed at enabling "a local reform process, which was to ensure an improved performance in the marine fisheries sector, characterized by a sustainable flow of social and economic benefits to coastal fisheries communities and a healthy marine environment". Therefore, even if the Bank task team explained to IEG that (i) the fisheries infrastructure under the project was built to higher resilience standards adequate for coastal areas, (ii) the communication system for fishermen at sea is also used to warn them about natural disasters, and (iii) enhanced livelihood for fishermen due to sustainable fishing will enable them to better resist the negative economic consequences of a natural disaster, the activities under the fisheries component did not directly aim at enhancing resilience to hydro-meteorological and geophysical hazards. The PDO statement could have been improved by referring to resilience in more generic terms. However, even in such a case, clarity in concepts would have been desirable. The PDO was also not clear with respect to the meaning of "capacity of project implementation entities" because capacity strengthening activities largely covered communities, teachers, students, and various government institutions.

On balance, the **relevance of objectives is rated substantial**. This rating reflects the PDO's high relevance in the country context and the full alignment with Bank priorities, on the one hand, and a PDO statement that does not adequately reflect key project activities and outcomes, on the other hand.

Rating

Substantial

4. Achievement of Objectives (Efficacy)



OBJECTIVE 1

Objective

To increase the resilience of coastal communities in Tamil Nadu and Puducherry to a range of hydro-meteorological and geophysical hazards

For the purpose of this validation, hydro-meteorological hazards are understood as hazards caused by extreme meteorological and climate events, such as floods, droughts, hurricanes, tornadoes, or landslides, and geophysical hazards are understood as hazards caused by geological or geomorphological processes, such as earthquakes, volcano eruptions, tsunamis, or landslides.

Rationale

The theory of change for Objective 1 was that the activities to construct multi-hazard resilient houses and multi-purpose evacuation shelters and routes, install multi-hazard underground electricity networks and early disaster warning systems, resiliently reconstruct public buildings, reconstruct culverts and bridges, provide fishermen with a wireless communication systems, and resiliently construct or upgrade fishery infrastructure would have as outputs more resilient infrastructure, early warning systems for disasters, and evacuation routes and shelters. In terms of outcomes, this was to lead to greater resilience of coastal communities in Tamil Nadu and Puducherry to a range of hydro-meteorological and geophysical hazards. In the longer run, it was expected to lead to reduced losses of human lives and economic assets from natural disasters in Tamil Nadu and Puducherry (PAD, paras 5, 19, and 21 to 37). The main assumptions were that (i) local contractors had the capacity to design and construct the resilient infrastructure, (ii) the infrastructure would be regularly maintained, (iii) the early warning system would be functional and operated properly, and (iv) the project beneficiaries would trust the information systems and act upon the warnings in a timely manner (ICR, para 5).

Outputs:

The project produced the following outputs captured by indicators in the results framework:

- 15,534 multi-hazard resilient houses constructed in 11 coastal districts (Tamil Nadu: 14,347, Puducherry: 1,187), nearly achieving the target 16,000;
- 2,022 km of underground electricity network installed, exceeding the target of 1,850 km. The project not only installed the underground cabling but also connected 91 percent of the planned 39,204 households and establishments to it (this was not an indicator in the results framework). The ICR, footnote 48, points out that once COVID-19 lockdown restrictions are removed rapid progress is expected to be achieved, and all service connections will be charged.
- 121 multi-purpose evacuation shelters constructed in vulnerable coastal communities, exactly in line with the target. This provided access to shelters for 357 vulnerable coastal areas (this was not an indicator in the results framework). The government of Tamil Nadu issued operational guidelines to manage and maintain the multi-purpose evacuation shelters, shelter management committees were constituted for all shelters, and funds were made available for basic repairs and maintenance;
- 41 km of evacuation routes for vulnerable communities to access the evacuation shelters constructed, slightly short of the target of 44 km. The Bank task team explained to IEG that 44 km was an estimate and that connectivity for evacuations is adequately ensured;
- 450 early warning systems installed, exceeding the target of 439;



- Two heritage public buildings affected by and vulnerable to natural disasters and of cultural and economic value reconstructed/rehabilitated (one of these buildings was 55 percent complete by project end and 90 percent complete in August 2021), not achieving the target of 3;
- Two culverts that provide access to evacuation shelters during an emergency for coastal habitation in Puducherry reconstructed and augmented, exactly achieving the target;
- 18,555 fishers provided with VHF wireless communication system ensuring safety at sea of 18,555 fishing boats, significantly exceeding the target of 5,000;
- Seven fisheries information and service centers established that provide weather advisory communications to registered fishers every 12 hours, including warnings to fishermen not to venture into the sea during cyclones, caution/alerts for them to return to shore, daily communications of potential fishing zones to increase fish catch, and serve as electronic service centers for the Department of Fisheries; and
- 39 fisheries-related infrastructures, such as fish markets, constructed or upgraded, significantly exceeding the target of 19. This provided access to improved infrastructure for 49 fishing villages, instead of 45 as originally planned (the latter was not an indicator in the results framework). The ICR does not refer to the resilience of this infrastructure, but the Bank team pointed out to IEG that it was constructed to higher resilience standards adequate for coastal areas. The ICR, para 37, points out that new modern facilities, such as the fish market in Puducherry, remain underutilized due to fishing communities' low awareness and/or comfort levels, while the four upgraded existing fish markets are extensively utilized and were completed at a fraction of the cost and time.

Other outputs not directly captured in the PDO:

- Four regional fisheries co-management platforms formed and involved in fisheries management plans, exactly in line with the target. In addition, co-management committees were also established at the state (1), district (13), and village levels (566) in the two project states to foster cooperative and equitable management of marine resources;
- 35 fishing harbor/landing center management committees established in Tamil Nadu;
- A fisheries resources data set established for knowledge management and decision support in fisheries resource management, along with upgrades to the Tamil Nadu Central Fisheries Library and a fisheries knowledge center, library, and meta data center in Puducherry; and
- Activities to enhance fisheries-related livelihoods, such as the piloting of 12 fish vending kiosks, providing 30 fully subsidized seaweed rafts, demonstrating bivalve farming, distributing 50 percent-subsidized outboard engines for small-scale fishermen to go into deeper waters, 25 fully subsidized transport vehicles, and 100 50 percent subsidized two wheelers with ice boxes, training fishermen in value addition processes, global positioning system mapping, and solar fish drying.

The project did not carry out the following activity, thus did not reach the respective output target:

- Bridges rehabilitated and reconstructed, not reaching the target of 3. The Bank task team clarified with e-mail of January 31, 2022 to IEG that this has no negative impact on resilience because the bridges continue to operate and if they are assessed as unsafe, the government will carry out the rehabilitation.

Outcomes:



The project enhanced the resilience of coastal communities in Tamil Nadu and Puducherry by providing 97 percent of households with quality-certified multi-hazard resilient houses, slightly below the target of 100 percent. In terms of impacts, the ICR, para 31, reports that during Cyclone Gaja in 2018 about 250,000 houses were damaged whereas during Cyclone Thane in 2011 about 450,000 houses were damaged (both categorized as very severe cyclonic storms, but their wind speeds varied slightly: Cyclone Thane - 103 mph, Cyclone Gaja - 87 mph). Although no storm is identical and the reduced damage cannot be unequivocally ascribed to enhanced resilience, it is plausible that the project contributed to it. The Bank task team also explained to IEG that several cyclones stroke the area after the completion of the housing subcomponent, and while the Bank-financed houses withstood them without major damage, the existing houses were mostly destroyed.

The multi-purpose evacuation shelters and the necessary evacuation routes near vulnerable communities ensure that 100 percent of habitations have access to community managed evacuation shelters, fully achieving the target. According to the ICR, para 32, the shelter designs deliberately considered the needs of women and disabled populations while incorporating resilient design features for all with kitchens, gender-segregated and handicap-accessible toilets and living spaces, overhead water tanks and raised plinths or stilt floors to address flooding risks, and space for livestock. The total design capacity of the shelters built is estimated at 115,500 people (ICR, para 32). The shelters in Tamil Nadu were used to evacuate during the December 2015 floods, the 2017 Ockhi Cyclone, and the 2018 Gaja Cyclone. The ICR, para 33, reports that this considerably reducing human casualties but did not include any numbers. The Bank task team also explained to IEG that the death number in more recent cyclones was relatively low compared to the past ones (again without providing numbers) and that the evacuation process worked very well. Before the project, only a few evacuation shelters existed, there was no effective functional warning system, and people did often not evacuate. The evacuation shelters were also used when a village of Kanyakumari experienced an episode of sea erosion. In nonemergency times, the shelters were regularly used as schools, public health centers, and venues for community functions like weddings, meetings, and trainings to varying degrees.

The project covered 450 coastal populations with the early warning systems compared to a target of 439, slightly exceeding the target of 100 percent coverage of the planned coastal populations. According to the ICR, para 34, the system uses resilient design features, such as solar panels with 48-hour battery backup, towers built to resist wind speeds of up to 250 km/hour, and message transmission capabilities via mobile phone tower networks in case of ethernet network failures. The system was used by several district collectors, such as the Collector of Vedaranyam, to alert communities of Cyclone Vardah in December 2016. The Bank task team pointed out to IEG that the system had been put in use in phases during in the last four year and was systematically used in all disasters.

The project equipped 18,555 fishers with wireless communication facilities, exceeding the target of 100 percent of the 5,000 planned fishers with such facilities by 237 percent. In terms of impacts, the ICR, para 35, points out that warnings broadcasted to fishers during Cyclone Gaja in 2018 using this system ensured that there was no loss of life at sea compared to Cyclone Ockhi, when over 350 fishers died in Tamil Nadu and Kerala. In addition, para 35 also points out that a beneficiary feedback survey by the Department of Fisheries indicated that that many fishers' lives have been saved due to the presence of VHF sets onboard.

Finally, the project provided 2,022 km of underground cabling, covering 109 percent of the planned 1,850 km of coastal areas with electrical underground cabling and exceeding the target of 100 percent. This cabling is significantly more resilient to hydro-meteorological and geophysical hazards than the electricity lines on the ground. The Bank task team explained to IEG that with the underground cabling, electricity can be very



quickly restored. The team also highlighted that because of the positive experience under the project, underground cabling has become the national standard in disaster-prone areas.

The project provided households, habitations, coastal populations, and fishers with infrastructure designed for greater resilience and access to evacuation shelters and early disaster warning systems, fully achieving or exceeding most of the targets. The evacuation process significantly improved compared to the past. For resilience enhancement interventions like this, it is almost impossible to provide quantitative data on avoided damages and loss of life by project end. Nevertheless, the successful achievement of most of the targets and the comparative data on the impact of disasters before and after the project interventions, make it plausible that the project led to greater resilience to hydro-meteorological and geophysical hazards and fully achieved this objective. In addition, as pointed out by the Bank task team in the meeting with IEG, more resilient infrastructure means that people can go back to their normal life more quickly after a disaster because there is no need to reconstruct houses or other facilities. **Based on the above, the efficacy of Objective 1 is rated substantial.**

Rating

Substantial

OBJECTIVE 2

Objective

To improve project implementing entities' capacity to respond promptly and effectively to an Eligible Crisis or Emergency

The PAD, para 14, points out that the project was to (i) focus on capacity building of various government institutions and vulnerable coastal communities, (ii) the PDO indicators for this objective refer to increased institutional capacity for risk mitigation and response at the state level, and (iii) component 3 aimed at capacity strengthening of government institutions, civil society, the school education system and coastal communities. Therefore, for the purpose of this review, "implementation entities' capacity" is interpreted in the broader sense of "government institution's, school system's, and vulnerable coastal communities' capacity".

Rationale

The theory of change for Objective 2 was that the activities to (i) strengthen the State Disaster Management Authority in Tamil Nadu, (ii) strengthen the CBDRM program, (iii) expand and integrate the emergency operation centers in Puducherry, (iv) develop the curricula on disaster risk reduction for schools and training institutions, (v) complete the preparation of the ICZM plan for Tamil Nadu, (vi) erect high tide line pillars and maps, (vii) train stakeholder on coastal zone management, (viii) provide the Fire Service Department with equipment and training, and (ix) provide for Contingent Emergency Financing during project implementation would lead to the outputs of (i) strengthened DRM institutions, (ii) implemented CBDRM programs and disaster risk reduction curricula in schools and training institutions, (iii) a completed ICZM plan, (iv) high tide line pillars and maps, (v) trained stakeholders in coastal zone management, (vi) an equipped and trained Fire Service Department, and (vii) the availability of resources to quickly respond to an eligible crisis or emergency during project implementation. These outputs were expected to lead to outcomes such as improved government institution's, school system's, civil society's, and vulnerable coastal communities' capacity to respond promptly and effectively to an eligible crisis or emergency. In the longer run, this was expected to



lead to reduced losses of human lives and economic assets from natural disasters in Tamil Nadu and Puducherry (PAD, paras 5, 19, and 21 to 37). The main assumptions were that (i) project activities were implemented, (ii) the equipment and tools were used, and (iii) the participants in training activities enhanced their capacity.

Outputs:

The project produced the following outputs captured by indicators in the results framework:

- CBDRM program completed in 561 coastal villages in Tamil Nadu, exceeding the target of 150 villages by 374 percent. The CBDRM program included (i) forming Village Disaster Management Committees, (ii) conducting risk and vulnerability assessments and preparing village DRM plans, (iii) undertaking community mobilization and capacity building activities, such as mock drills and training activities, (iv) forming and training Village Disaster Management Teams in early warning, evacuation, search and rescue, shelter management, and first aid. Over 400,000 people participated in the trainings. The Bank task team mentioned to IEG that this program was incorporated into a state program after 2018 and takes place on a yearly basis; and
- 5,725 high tide line pillars installed in 11 coastal districts in Tamil Nadu, fully achieving the target. The Bank task team explained to IEG that in addition to physically installing the pillars, the tide line is also mapped in a GIS system.

The project also produced the following outputs not captured by indicators in the results framework:

- Puducherry Fire Services Department equipped with improved tools, such as aerial ladders and rescue kits, and training;
- Comprehensive GIS platform and decision support system "TN-SMART" established. The system incorporates dynamic hazard forecasts from the India Meteorological Department, which are used to disseminate forecast-based alerts and estimates of potential disaster impacts;
- "TN-SMART" mobile application launched to provide warnings on disaster risks and preparedness measures launched. This mobile application did not have the expected uptake because it was not user-friendly. By project end, the government was improving it with their own resources to attract more users;
- Disaster risk reduction (DRR) curriculum developed for the Tamil Nadu and included in the school curricula for all children in grades 6–12 in the state board, reaching about 15 million students in over 40,000 schools;
- Integrated teacher trainings on DRR developed and integrated into the curricula of the District Institute of Education and Training, 403 government-aided teacher training institutes, and the Diploma in Education program for Tamil Nadu. Over 3,500 master trainers were trained, who in turn trained educators in all government and government-aided schools in Tamil Nadu;
- Availability of IDA credit enabling the relocation of resources to quickly respond to an eligible crisis or emergency during project implementation; and
- Based on the discussion of the Bank task team with IEG, completion of the ICZM plan for Tamil Nadu and training of stakeholders in coastal zone management.

The project did not carry out following activities as planned, thus did not reach the respective outputs:



- Establishment of a Centre for Disaster Management in Tamil Nadu in line with the target because of delays by the recipient in preparing a proposal for this activity and difficulties to find a project site. This center was meant to be a critical to operationalize the Tamil Nadu State Disaster Management Authority to become the focal agency for DRM activities at the state level. It was to carry out knowledge management and communication; research and development with an emphasis on decision support systems and early warning; training and capacity-building; and operational support to state, district, and local level institutions for disaster response and recovery (ICR, para 44). The Bank task team explained to IEG that the activities to be carried out by this Center were adequately taking over by the State Disaster Management Authority and there is no need to establish this Center anymore; and
- Integration of multiple Emergency Operation Centers in line with the target because of delays by the recipient in finalizing a proposal for this activity. These Emergency Operation Centers were meant to be strengthened and integrated into one centralized system to facilitate effective coordination and communication in emergencies (ICR, para 44). The Bank task team pointed out to IEG that even if this activity was not carried out (i) the Emergency Operation Centers are communicating with each other, (ii) the comprehensive GIS platform and decision support system "TN-SMART" can already be used to access data of the different Centers, and (iii) this system has the potential to ensure the planned integration over time.

Outcomes:

The project better prepared a significantly larger amount of coastal villages to respond promptly and effectively to an emergency through the CBDRM training, exceeding the target by 274 percent. The ICR, para 41, points out that the CBDRM program enabled the coastal communities to increase awareness of and engagement with the project's multi-purpose evacuation shelters and emergency warning system and instilled a sense of ownership of the evacuation shelters through the program's shelter management committee activities. For example, a Village Disaster Management Committee in Cuddalore mobilized funding to install water filters and maintain electricity generators' batteries for their emergency shelters. The ICR also argues that because of the project, communities are more knowledgeable about different DRM agencies and the officials' roles and responsibilities. This led to the creation of WhatsApp groups for communities to directly report issues to responsible officers in certain districts. Such groups have also been used as direct lines of communication in emergency situations. In addition, after the CBDRM program, communities were more responsive to the early warnings issued by the government compared to past events.

The project also provided the Puducherry Fire Department with improved rescue equipment in line with the target. According to the ICR, para 42, the specialized equipment and training enabled the Fire Services Department to respond better in disaster situations since 2016, such as during Cyclone Gaja in 2018, particularly with the increase in multistory buildings in recent times.

The project had no additional indicators to measure the achievement of objective 2, but the ICR and the Bank task team provided evidence of the use and impact of several of the project outputs. For instance, the state and district authorities used the "TN-SMART" system and application during Cyclone Gaja to monitor dynamic weather forecasts from various sources, identify vulnerable regions, and disseminate warnings to nearly 13,000 registered users in the identified regions. They also used the application to communicate drought, flooding, and rainfall forecasts in less extreme situations (ICR, para 43). The ICR points out that this experience inspired the development of similar platforms at both national and state levels.



The ICR, para 45, mentions that the integration of DRR in the school and training curricula significantly increased awareness about disasters and DRR. The 2020 Review of Results for this project assigned a very high impact-to-cost ratio to creating a culture of better DRM. The Bank task team pointed out to IEG that the inclusion of DRR into the school and training curricula is a sustainable way to ensure awareness and preparedness in youth.

The Bank task team also explained to IEG that the high tide line pillars and maps are used by the government authorities for risk-informed development planning.

During project implementation, the capacity to respond was enhanced through zero-cost component. Even if the availability of this financing stopped with the completion of the project, according to what the Bank task team mentioned to IEG, the project area has access to the national and state disaster response funds.

The project was successful in creating awareness on DRR in a large number of students and vulnerable coastal communities in a sustainable manner. The project also provided community and government institutions with useful tools to respond to an emergency or crisis, and these systems, tools, and applications were being used and further development by projects end. Only two capacity strengthening activities were not carried out as planned but the impact of this omission on improving the response capacity overall can be considered minor. Therefore, it is plausible that this project improved the capacity to respond promptly and effectively to disasters with minor shortcomings, and **the efficacy of Objective 2 is rated substantial.**

Rating

Substantial

OVERALL EFFICACY

Rationale

Most project investments were successfully implemented and the project increased the resilience of coastal communities to hydro-meteorological and geophysical hazards and strengthened the capacity to quickly respond to an emergency or crisis with minor shortcomings. Therefore, **the project's overall efficacy is rated substantial.**

Overall Efficacy Rating

Substantial

5. Efficiency

At appraisal, the project did not carry out detailed cost-benefit analyses for project components and subcomponents, but used existing literature to provide benchmark cost-benefit ratios (CBR), except for the



underground electricity network. For the latter, the project carried out a cost-benefit analysis based on avoided damages. Discount rates and time timeframes used in the analyses are reasonable.

For the multi-hazard-resistant permanent house construction, it was estimated that every US\$ spent on concrete multi-hazard resilient permanent housing yielded US\$0.60 in benefits.

For early warning systems, the benefits were estimated to be between 3.7 and 7.3 for every dollar spent. The average benefit from evacuation routes was estimated to be 4.5 for one US\$ spent. The evacuation shelters were expected to yield US\$80 per death averted.

For the sustainable fisheries component, the estimated CBR was estimated to range from 2.2 to 3.5 for every US\$ spent, and the planned US\$24 million in community livelihood investments were expected to generate a financial internal rate of return (IRR) of 10.7 percent and an economic IRR of 20.5 percent.

For the CBDRM program and capacity building, one dollar spent on hazard mitigation, including public awareness raising and education, were expected to generates US\$4 on average in future benefits.

For the ICZM, the project estimated that with a mean estimate of about US\$0.4 million/km of coastline, Tamil Nadu alone was to accrue \$430.4 million in benefits every year.

For the underground electricity network, considering a life of 60 years and a discount rate of 10 percent, the estimated net present value (NPV) was about US\$16.85 per pole.

At completion, the project carried out detailed economic analyses for the multi-hazard-resistant permanent house construction, the evacuation and early warning infrastructure, and the resilient underground electricity network, and an aggregated analysis for the sustainable fisheries component for the ex-ante and ex-post situation. This covered 91 percent of the project cost. For these analyses, the methodology was linked to the methodology used at appraisal by recalculating the economic IRRs and NPVs based on the minimum CBR benchmarks in the PAD and assuming a five-year project implementation period.

For the resilient underground electricity network, the PAD did not include a CBR. Therefore, the economic analysis was based on the actual loss of the power company from Cyclone Thane.

For the multi-hazard-resistant permanent house construction, the recalculated appraisal IRR was estimated to be 4.4 percent, the NPV was estimated to be –US\$22.2 million, and the CBR was estimated to be 1:0.6. At project close, the IRR was estimated to be 10.6 percent, the NPV was estimated to be between US\$1.9 and 27.7 million, and the CBR was estimated to be between 1.1 and 1.6 based on 10 percent and 5 percent discount rates.

For the early warning infrastructure, the recalculated appraisal IRR was estimated to be 30.1 percent, the NPV was estimated to be US\$190.5 million, and the CBR was estimated to be 3.7. At project close, the IRR was estimated to be 48.3 percent, the NPV was estimated to be between US\$238.8 and 463.1 million, and the BCR was estimated to be between 5.6 and 8.6, using 10 percent and 5 percent discount rates.

For the resilient underground electricity network, the recalculated appraisal IRR was estimated to be 12.1 percent, the NPV was estimated to be US\$13.7 million, and the CBR was estimated to be 1.2. At project close, the IRR was estimated to be 12.6 percent, the NPV was estimated to be between US\$4.9–27.6 million, and the CBR was estimated to be between 1.2 and 1.8, using 10 percent and 5 percent discount rates.



For the sustainable fisheries component, the recalculated expected appraisal IRR was 20.9 percent, the NPV was US\$88.0 million, and the CBR was 2.2. At project close, the IRR was estimated to be 31.9 percent, the NPV was estimated to be between US\$122.8–256.9 million, and the CBR was estimated to be between 3.7 and 5.8, using 10 percent and 5 percent discount rates.

In aggregated terms, the recalculated estimated appraisal IRR of the overall project was 17.5 percent, the NPV was US\$71.8 million, and CBR was 2.0. At project close, the estimated IRR of the overall project was 28.5 percent. The NPV was between US\$108.8–224.9 million, and the CBR was between 3.2 and 5.0, using 10 percent and 5 percent discount rates. The higher economic efficiency at project completion compared to the appraisal estimate is due to cost savings.

Cost Effectiveness, Administrative and Operational Efficiency:

This project had a 23-month delay in implementation for the reasons pointed out in Section 2, but the total actual project cost was significantly below the cost estimated at appraisal. The project achieved 90 percent of the number of multi-hazard-resistant houses at 67 percent of the costs at appraisal. For the evacuation shelters, early warning system, and evacuation routes all output targets were achieved at 80 percent of the budgeted costs at appraisal.

Despite the implementation delays, some of which beyond the project's control, the project's investments were carried out cost efficiently as shown in the project's significantly higher ex-post IRR than the appraisal estimate. Therefore, **the efficiency of project implementation is rated substantial.**

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	✓	17.50	91.00 <input type="checkbox"/> Not Applicable
ICR Estimate	✓	28.50	90.00 <input type="checkbox"/> Not Applicable

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

6. Outcome

The project's relevance of objectives, efficacy, and efficiency are rated substantial. Consequently, **the project's overall outcome is rated satisfactory.**



a. **Outcome Rating**

Satisfactory

7. Risk to Development Outcome

The following pose risks to development outcomes:

- **Government ownership and commitment.** This risk is low. The ICR, para 100, points out that the project included several mechanisms to ensure sustainability, including capacity development of line departments and relevant state and district agencies for long-term planning and maintenance, community ownership and participation schemes, multi-hazard insurance for houses built by the project, and financial resources for the governments of Tamil Nadu and Puducherry to budget for long-term maintenance through increased fishery revenues. According to a study of the Indian Institute of Human Settlements in 2020, these mechanisms increased the sense of ownership, delineated clear roles and responsibilities, and allowed for timely maintenance and repairs. The ICR also mentions that officials and agencies involved in the project are now scaling up similar projects in other areas, such as the underground electricity cabling and the CBDRM activities. In addition, the ICR, para 102, mentions that the evacuation shelter maintenance committees play an important role in ensuring the maintenance of these shelter. For the restoration of the Mairie Building in Puducherry and the underground cabling in Tamil Nadu, the state governments have completed the activities using state funds after project closing, which shows ownership. The Bank task team mentioned to IEG that although the current maintenance arrangements have shortcomings, the project made a significant progress in this respect. Nevertheless, the COVID-19 pandemic might pose a risk of diverting state governments' policy attention towards recovery activities related to the pandemic and away from the project activities and its maintenance. The team also clarified that the lack of use of certain infrastructure, such as a new fish market or certain evacuation shelters, was a problem immediately after the completion of these facilities, but it has been largely overcome later through strong outreach and awareness raising.
- **Exposure to natural disasters.** The development outcomes are at risk from natural disasters. The ICR, para, 101, highlights that the project infrastructure was built according to Indian Road Congress and Bureau of Indian Standards guidelines and the specifications for multi-hazard resilience based on the historical intensity and frequency of natural disasters to date. However, due to climate change, the increased frequency and intensity of hydro-meteorological hazards are likely to pose unprecedented risks to the structural integrity of physical infrastructure.
- **Technical risk.** The project financed several systems and a mobile application. These systems, such as the early warning system, are functioning correctly, but there is a risk that they get outdated.

8. Assessment of Bank Performance

a. **Quality-at-Entry**

The Bank task team intervened in areas highly relevant for Puducherry and Tamil Nadu. The task team benefited from experience in the previous Emergency Tsunami Reconstruction Project, on which they



built. Team leaders and consultants who designed and implemented the predecessor project were heavily involved in ensuring that the project continued and augmented unfinished works from the previous project (ICR, para 91). According to the PAD (para 4), the project design integrated the lessons from the previous project and from disaster events faced by the Puducherry and Tamil Nadu coast, which emphasized the need for capacity building of government institutions and vulnerable coastal communities.

The Bank team included in the project design structural and nonstructural elements, both important to enhancing the resilience of target populations to natural disasters. They also build in mechanisms to ensure the sustainability of investments, such as village maintenance committees for the physical infrastructure and revenue co-management systems for fisheries in the region to fund O&M. Being this a multi-sectoral project, the design was complex by nature, including a large amount of activities, various PIUs and beneficiaries, and a large geographical spread.

The Bank task team paid adequate attention to the social, environmental, and fiduciary aspects during preparation.

The Bank task team rated the overall project risk as moderate and mainly flagged risks related to coordination and weak capacity (PAD, annex 4). The mitigation measures were not fully adequate, and the team underestimated the challenges and time required for the new implementing agencies of the underground electricity cabling to carry out procurement and implement these activities. The team did also not identify the risk that some institutional and capacity strengthening activities would not take place as planned.

The M&E framework had shortcomings (see Section 9), especially because of weak and insufficient PDO indicators. In addition, most fisheries-related activities, which amounted to about a fourth of the project cost, were not logically linked to the PDO in the results chain and only partially contributed to the achievement of the PDO (see section 3). The Bank project team did also not define what they meant by "implementing entities' capacity to respond promptly and effectively to an Eligible Crisis or Emergency".

The Bank task team adequately supported project preparation and appraisal, but the project design had moderate shortcomings, i.e., in risk identification, M&E and the results chain design. Therefore, **the project's quality at entry is rated moderately satisfactory.**

Quality-at-Entry Rating

Moderately Satisfactory

b. Quality of supervision

The Bank task team was adequately staffed and included adequate technical and country experience. The team carried out the normal regular supervisions at six-month intervals, including field visits. According to the ICR, para 96, the team provided hands-on technical advice, for instance, to strengthen the oversight of the construction quality of the evacuation shelters.



The Bank task team candidly and thoroughly reported on project problems, such as the resettlement and financial reporting issues mentioned in section 10.

However, the Bank task team did not restructure the project to correct the shortcomings in the results framework. In addition, the team only formally revised the results framework on the last day of project implementation to incorporate various changes already reflected in ISRs in 2014 and 2018. The team did also not adjust the PDO to reflect the fisheries-related activities. Finally, the team failed to reflect in the restructuring several activities that had been informally dropped, such as the restoration of a public building or institutional strengthening activities.

The Bank task team informed IEG that they did not travel to the project site to carry out the ICR preparation mission because of Covid-19. Instead, the task team relied on the reports from the Indian Institute of Human Settlements, who had gone to the field and conducted interviews. The Bank task team last visited the project site in late 2019.

In summary, the Bank task team adequately supported the implementation of this complex project, also reflected in the satisfactory efficacy and efficiency ratings. Although the Bank team did not restructure the project to correct the design shortcomings related to the M&E and the results chain and adjust the project activities, they provided adequate information to evaluate its achievements. Consequently, **Bank performance in supervision is rated satisfactory.**

Quality of Supervision Rating

Satisfactory

Overall Bank Performance Rating

Moderately Satisfactory

9. M&E Design, Implementation, & Utilization

a. M&E Design

The PMU was to be responsible for project implementation, monitoring, safeguard and fiduciary compliance and financial management (PAD, annex 3). According to the PAD, annex 1, the project implementation departments for individual components were responsible for physical progress monitoring, regular quality supervision, and certification. The implementation agencies were to carry out monthly surveys in their respective domains (districts) to record and report on progress of works. In coordination with the respective beneficiaries and contractors, the project implementation agencies were to identify any constraints and delaying factors. In addition, a third party was to be deployed for quality monitoring of works and compliance on social and environmental aspects and a three-stage benefit monitoring and evaluation study was to be carried out by the PMU and the project implementation agencies.

As seen in section 3, the theory of change had shortcoming in showing how some of the fisheries-related activities and outputs would contribute to the achievement of the PDO. Although the results framework included indicators to capture these activities, the PDO was not sufficiently clearly specified to fully encompass their outcomes. For instance, increasing the "percentage of local fisheries co-



management platforms formed and involved in fisheries management plans" does not directly contribute to the objective of increasing the resilience of coastal communities to hydro-meteorological and geophysical hazards. The PDO was also not clear with respect to the meaning of "capacity of project implementation entities" because capacity strengthening activities largely covered communities, teachers, students, and various government institutions.

Although with the support of additional evidence, the PDO indicators were largely adequate to assess the project's achievements, the PDO indicators had shortcomings. The key PDO indicators to measure improved resilience captured the percentage of households, habitations, or communities with more resilient infrastructure, emergency evacuation structures, and early warning systems to measure improved resilience to hydro-meteorological and geophysical hazards. These indicators are closer to measuring outputs than outcomes because they only measure that resilience-related infrastructure was provided and not that this infrastructure actually withstood shocks, which would be difficult because such shocks do not necessarily occur by project close. Although this type of indicators is normally used to measure resilience in DRM projects, ideally, the project could have modelled the ability to resist and/or recover from damage from hydro-meteorological and geophysical hazards by simulating the expected losses with and without the project.

The objective of improving the capacity of project implementation entities to respond to disasters was measured by a single output-based indicator "percentage of fire departments with improved rescue equipment", which captured only a small dimension of the capacity building activities (the PAD listed the PDO indicator "percentage of coastal villages better prepared through CBDRM training" as indicator to capture improved resilience). Key capacity strengthening outcomes, such as the ones achieved through the inclusion of DRM in schools and teacher trainings curricula or the availability of the TN-SMART" system and application, were not captured. Although capacity strengthening is more difficult to measure, the project could have captured some expected changes in behavior, such as a more timely response the evacuation alerts or the number of people reached with and without TN-SMART. In addition, it should be possible to assess the DRR knowledge enhancement in students through the inclusion of the topic in the curricula.

Furthermore, the baselines values of all PDO indicators were in percentage terms and had a value of zero. This does not provide any indication about the "without project" situation of the counterfactual. For instance, knowing the number of households with quality-certified multi-hazard houses at appraisal and using this information as baseline would have provided a better understanding of the overall contribution of the project to enhance resilience in the project area. In addition, using percentages and not explicitly showing the denominator and numerator on which basis the targets will be calculated makes this calculation less transparent.

b. M&E Implementation

The ICR, para 80, points out that the client collected the information for the indicators in the results framework and submitted regular progress reports to the Bank. They provided quarterly and annual progress reports allowing the Bank task team to systematically track gaps in the project implementation progress and assess the need to modify the project design to evolving circumstances.

The planned final impact evaluation of the CBDRM program was not carried out due to COVID-19 constraints on fieldwork. Similarly, the project did not carry out the beneficiary surveys of the resilient



housing, evacuation shelters and evacuation routes, fishery facilities, and CBDRM program activities to gauge actual impacts on target populations before, during, and after each of these interventions, which would have enabled a more thorough evaluation of project outcomes (ICR, para 81).

The project was not timely and adequately restructured to correct the design shortcomings in the results framework and the logical results chain.

c. M&E Utilization

According to ICR, para 83, the project used the M&E data to inform the preparation of ISRs and report back to Bank management. They also used it for project management and decision-making and to implement corrective measures to address delays. For instance, regularly tracked targets showed slow implementation progress, particularly in the multi-hazard-resilient electrical networks, bridges and public building restoration, and the establishment of DRM and emergency operation centers, playing a crucial role in the decisions to extend the project's closing date in the project's first two restructurings.

M&E Quality Rating

Modest

10. Other Issues

a. Safeguards

The project was classified as category B for environmental assessment purposes. The following safeguards policies were triggered: Environmental Assessment OP/BP4.01, Physical Cultural Resources OP/BP 4.11, and Involuntary Resettlement OP/BP4.12. The main environmental and social risks were related to insufficient attention to and/or delays in effective implementation of environmental and social management plans and potential noncompliance with Bank environment safeguard policies due to lack of capacity. Regular monitoring and reporting of compliance by line departments were predicted to pose challenges during project implementation (ICR, par 85).

The recipient revised the environment and social management framework of the previous Emergency Tsunami Reconstruction project, incorporating the additional safeguard requirements for the new components and the completion of pending safeguard due diligence, such as disclosure of safeguard documents locally and at the Bank InfoShop for the retroactively financed subprojects. The revision also incorporated the learning from earlier environmental and social management frameworks and the findings of the "Quick Review of Safeguard Issues" carried out for the sub-projects proposed to be financed retroactively by the project. It included an environment management plan, ecological and biodiversity study, archeological survey, a resettlement action plan, a resettlement framework, and social assessment (PAD, para 87).

In terms of environmental performance, the Bank task team mentioned to IEG that the project experienced no major environmental problems, the physical cultural resource safeguards policy was



satisfactorily applied in the restoration of two historical buildings, and there was compliance with these safeguards policies.

With respect to social safeguards, the project did not comply with the resettlement safeguards policy in 2015, and the safeguard rating was changed from moderately satisfactory to unsatisfactory. This was due to a violation of the ESMF at the Mallipatnam site of the fishing harbor, where 129 families were forcefully evicted. The project prepared a resettlement remedial action plan and successfully implemented it during two years, with all but two project-affected people compensated by project end. The Bank task team explained to IEG that the latter did not present the necessary documentation to be compensated.

b. Fiduciary Compliance

As for procurement, the ICR, para 88, points out that the project largely complied with World Bank procurement guidelines and procedures and that overall, the procurement processes were carried out without major issues. In Tamil Nadu, the only noteworthy problem was the delay in awarding the contract for the underground electricity lines. In Puducherry, frequent staff turnover and weak contract management capacity resulted in complaints to the World Bank about substantial delays in making contract payments.

In terms of financial management, the ICR, para 89, for Tamil Nadu points out the project had shortcomings in terms of timeliness and quality of financial reporting and lists a number of issues mainly due to inadequate staffing at district and lower levels. These included (i) poor maintenance of financial records and delays in bank reconciliation processes, (ii) differences in account balances between state and district offices, (iii) delays in submitting utilization certificates or settlement of advances, and (iv) contract management issues such as improper maintenance of bank guarantees and inadequate insurance policies. The project did also not regularly conduct internal audits due to delays in the appointment of the auditor, and some of the audit reports had accounting and internal control issues. The training programs organized for the project staff resulted in improvements in financial management practices. The Bank task team pointed out to IEG that for Tamil Nadu, a number of financial audit reports had qualified opinions and that the team is still waiting for the answers of the project to the latest report received. The last financial audit report is delayed and expected to be received by the Bank in late January 2022. The annual budgets for project activities were adequate, and no delays were observed in providing funds to implementing agencies.

Puducherry did not experience capacity issues because they used the support of a consulting firm. There were no delays in fund flows and financial reports and annual audit reports were submitted on time. According to the Bank task team, the reports were always unqualified.

c. Unintended impacts (Positive or Negative)

The ICR, para 31, reports that the houses built by the project included, among others, toilets and that this led to an upward trend in the usage of toilets among women and girls.



d. Other

11. Ratings

Ratings	ICR	IEG	Reason for Disagreements/Comment
Outcome	Moderately Satisfactory	Satisfactory	Incorrect calculation of outcome rating in ICR
Bank Performance	Moderately Satisfactory	Moderately Satisfactory	
Quality of M&E	Substantial	Modest	Shortcomings in M&E design not corrected during implementation
Quality of ICR	---	Substantial	

12. Lessons

The following lessons have been derived and summarized from the ICR, with minor additions by IEG after discussions with the Bank task team:

It may be more effective to upgrade existing fisheries facilities than to construct new ones.

This project showed that existing and already used facilities by local communities have an advantage over new facilities because communities are familiar with them and feel comfortable. Under the project's fisheries component, new modern facilities, such as the fish market in Puducherry, remained underutilized due to fishing communities' low awareness a reluctance to change whereas the four upgraded existing fish markets were extensively utilized and were completed at a fraction of the cost and time. When possible, existing infrastructure should be upgraded and/or retrofitted instead of starting new greenfield projects.

Designing evacuation shelters as multifunctional shelters can enhance their likelihood of use and maintenance. The project showed that shelters that also functioned as schools or health centers and are located near households that care for them, are more likely to be used and maintenance than shelters that served only evacuation purposes.

Coupling the implementation of new infrastructure and systems with strong community capacity building programs to increase awareness on their existence and use can maximize their utilization and the benefits to target populations. This project's evacuation shelters and the early warning system saw varying degrees of use, and community awareness was one of the biggest factors in determining community use and maintenance. For instance, shelters initially poorly maintained and lacking ownership, saw improved use and maintenance after the formation of evacuation shelter maintenance committees and the CBDRM training programs. Similarly, villages varied in their awareness of these systems after completion and their knowledge on how to prepare and/or evacuate. While community capacity building components tend to be treated as an afterthought, the project showed significant multiplier effects from the successful implementation of the CBDRM program and the incorporation of DRR principles into the school curricula. Therefore, more resources should be devoted to design, implement, monitor, and evaluate these interventions to increase and track their benefits and spillover effects. In addition, trainings, mock drills, and other



experiential capacity building programs should be incorporated from the beginning to enable timely emergency responses.

The development of a digital engagement mechanism does not guarantee communities' engagement with and enhanced awareness of local disaster risk information. While the potential of the TN-SMART mobile application to reach target populations in Tamil Nadu efficiently has been widely recognized, to date, it has not been successful in reaching various publics, with a little over 200,000 downloads by citizens in a state that has the second highest number of rural smartphone users. The app should increase its user friendliness and provide relevant local information at a more granular level. Future interventions should explore the integration of mobile apps and the CBDRM programs to increase both the reach of the app and the accessibility of the trainings to remote communities.

13. Assessment Recommended?

No

14. Comments on Quality of ICR

The ICR is very well written and candid, especially in reporting on issues in Bank performance, including shortcomings in M&E design and project restructuring. It is also transparent as it includes a large amount of footnotes to explain how evidence was obtained. The ICR contains a very detailed presentation, in particular of the project achievements both in the efficacy section and the results framework annex. Although a detailed coverage of the achievements is important and a complex multisector project like this warrants a longer presentation, the ICR includes unnecessary repetitions, especially in the efficacy section and annex 1, which greatly increased the ICR's length. Except for the latter and the incorrect calculation of the overall outcome rating, the ICR complies with Bank guidelines.

The ICR is results-orientated. Although the quality of evidence suffered because of the impossibility to carry out project end surveys due to COVID-19, the ICR contained adequate data to report on project indicators and used additional data to triangulate the evidence, for instance, regarding the use of evacuation shelters and the reduced level of house destruction during extreme weather events. The ICR also refers to evidence in reports prepared by the Indian Institute of Human Settlements.

In the quality of M&E section, the ICR points out that the project used the word "resilience" as an umbrella concept for a range of desirable attributes in the PDO and that this made it difficult to attribute and measure specific benefits to the project beneficiaries. However, the ICR does not explicitly discuss this in the efficacy section and simply uses "resilience" in broad terms to include enhanced livelihood for the fishing community in the theory of change and when assessing the project's achievements.

The ICR also reports on other project impacts, such as the increase in female toilet use. The lessons are based on evidence and well formulated. The ICR includes a thorough recalculation of the IRRs, NPVs, CBRs at appraisal to compare it with the ex-post results. There are minor discrepancies between some figures in the main text and in annex 5.



The ICR does not mention how COVID-19 impacted the due diligence in project supervision and provides limited information on the ICR mission/data collection to assess the performance of the project.

On balance, **the quality of the ICR is rated substantial.**

a. Quality of ICR Rating

Substantial