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INTERNATIONAL DEVELOPMENT ASSOCIATION

PROJECT PAPER

ON A

PROPOSED ADDITIONAL GRANT

IN THE AMOUNT OF SDR 3.8 MILLION
(US\$5 MILLION EQUIVALENT)

TO THE

KINGDOM OF TONGA

FOR AN

ADDITIONAL FINANCING TO THE PACIFIC RESILIENCE PROJECT

May 28, 2022

Urban, Resilience And Land Global Practice
East Asia And Pacific Region

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CURRENCY EQUIVALENTS

Exchange Rate Effective April 30, 2022

Currency Unit = Pa'anga (TOP)

TOP 2.3 = US\$ 1

US\$ 1.3443 = SDR 1

FISCAL YEAR

July 1 - June 30

Regional Vice President: **Manuela V. Ferro**

Country Director: **Stephen N. Ndegwa**

Regional Director: **Benoit Bosquet**

Practice Manager: **Ming Zhang**

Task Team Leaders: **Simone Lillian Esler, Andrew James Hurley**

ABBREVIATIONS AND ACRONYMS

AF	Additional Finance
CERC	Contingent Emergency Response Component
CESMP	Contractors Environmental and Social Management Plan
CRW	Crisis Response Window
CSU	Central Services Unit
EIRR	Economic Internal Rate of Return
GDP	Gross Domestic Product
GEMS	Geo-Enabling Initiative for Monitoring and Supervision
GFDRR	Global Facility for Disaster Reduction and Recovery
GRID	Green, Resilient, and Inclusive Development
GRM	Grievance Redress Mechanism
HT-HH	Hunga Tonga-Hunga Ha'apai volcano
MEIDECC	Ministry of Meteorology, Energy, Information, Disaster Management, Environment, Climate Change and Communications
MOF	Ministry of Finance
MHEWS	Multi-hazard Early Warning Systems
NEMO	National Emergency Response Office
NPV	Net Present Value
NRD	Natural Resources Division
PDO	Project Development Objective
PMU	Project Management Unit
POM	Project Operations Manual
PPSD	Project Procurement Strategy for Development
PREP	Pacific Resilience Project
TMS	Tonga Meteorological Service
TWG	Technical Working Group

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BASIC INFORMATION – PARENT (Pacific Resilience Program - P154840)

Country Tonga	Product Line IBRD/IDA	Team Leader(s) Simone Lillian Esler		
Project ID P154840	Financing Instrument Investment Project Financing	Resp CC SEAU1 (9349)	Req CC EACNF (6680)	Practice Area (Lead) Urban, Resilience and Land

Implementing Agency: Ministry of Finance, Ministry of Environment, Energy, Climate Change, Disaster Mgmt, Meteorology, Information and Comms

Is this a regionally tagged project? No	
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Bank/IFC Collaboration No	
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Approval Date 19-Jun-2015	Closing Date 31-Oct-2023	Expected Guarantee Expiration Date	Original Environmental Assessment Category Partial Assessment (B)	Current EA Category Partial Assessment (B)
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Financing & Implementation Modalities

<input type="checkbox"/> Multiphase Programmatic Approach (MPA)	<input checked="" type="checkbox"/> Contingent Emergency Response Component (CERC)
<input checked="" type="checkbox"/> Series of Projects (SOP)	<input type="checkbox"/> Fragile State(s)
<input type="checkbox"/> Performance-Based Conditions (PBCs)	<input type="checkbox"/> Small State(s)
<input type="checkbox"/> Financial Intermediaries (FI)	<input type="checkbox"/> Fragile within a Non-fragile Country
<input type="checkbox"/> Project-Based Guarantee	<input type="checkbox"/> Conflict
<input type="checkbox"/> Deferred Drawdown	<input type="checkbox"/> Responding to Natural or Man-made disaster
<input type="checkbox"/> Alternate Procurement Arrangements (APA)	<input type="checkbox"/> Hands-on Expanded Implementation Support (HEIS)



Development Objective(s)

The objective of the Project is to strengthen early warning, resilient investments and financial protection of Tonga.

Ratings (from Parent ISR)

	Implementation				
	03-Dec-2019	12-Jun-2020	16-Dec-2020	27-May-2021	06-Dec-2021
Progress towards achievement of PDO	MS	MS	MS	MS	MS
Overall Implementation Progress (IP)	MU	MS	MS	MS	MS
Overall Safeguards Rating	MS	S	S	S	S
Overall Risk	S	S	M	M	M
Financial Management	MU	MS	MS	MS	MS
Project Management	U	U	U	MU	MS
Procurement	MU	MS	MS	MS	MU
Monitoring and Evaluation	MU	MU	MU	MS	MS

BASIC INFORMATION – ADDITIONAL FINANCING (Additional Financing to the Pacific Resilience Project in Tonga - P178848)

Project ID	Project Name	Additional Financing Type	Urgent Need or Capacity Constraints
P178848	Additional Financing to the Pacific Resilience Project in Tonga	Cost Overrun/Financing Gap	No



Financing instrument Investment Project Financing	Product line IBRD/IDA	Approval Date 24-Jun-2022	
Projected Date of Full Disbursement 29-Aug-2025	Bank/IFC Collaboration No		
Is this a regionally tagged project? No			

Financing & Implementation Modalities

<input type="checkbox"/> Series of Projects (SOP)	<input type="checkbox"/> Fragile State(s)
<input type="checkbox"/> Performance-Based Conditions (PBCs)	<input checked="" type="checkbox"/> Small State(s)
<input type="checkbox"/> Financial Intermediaries (FI)	<input type="checkbox"/> Fragile within a Non-fragile Country
<input type="checkbox"/> Project-Based Guarantee	<input type="checkbox"/> Conflict
<input type="checkbox"/> Deferred Drawdown	<input checked="" type="checkbox"/> Responding to Natural or Man-made disaster
<input type="checkbox"/> Alternate Procurement Arrangements (APA)	<input type="checkbox"/> Hands-on Expanded Implementation Support (HEIS)
<input type="checkbox"/> Contingent Emergency Response Component (CERC)	

Disbursement Summary (from Parent ISR)

Source of Funds	Net Commitments	Total Disbursed	Remaining Balance	Disbursed	
IBRD				<div style="width: 0%; height: 10px; background-color: #ccc;"></div>	%
IDA	25.45	20.46	5.28	<div style="width: 79%; height: 10px; background-color: #2e8b57;"></div>	79 %
Grants	6.08	2.51	3.57	<div style="width: 41%; height: 10px; background-color: #2e8b57;"></div>	41 %

PROJECT FINANCING DATA – ADDITIONAL FINANCING (Additional Financing to the Pacific Resilience Project in Tonga - P178848)

FINANCING DATA (US\$, Millions)



SUMMARY (Total Financing)

	Current Financing	Proposed Additional Financing	Total Proposed Financing
Total Project Cost	34.07	5.00	39.07
Total Financing	34.07	5.00	39.07
of which IBRD/IDA	25.45	5.00	30.45
Financing Gap	0.00	0.00	0.00

DETAILS - Additional Financing

World Bank Group Financing

International Development Association (IDA)	5.00
IDA Grant	5.00

IDA Resources (in US\$, Millions)

	Credit Amount	Grant Amount	Guarantee Amount	Total Amount
Tonga	0.00	5.00	0.00	5.00
Crisis Response Window (CRW)	0.00	5.00	0.00	5.00
Total	0.00	5.00	0.00	5.00

COMPLIANCE

Policy

Does the project depart from the CPF in content or in other significant respects?

Yes No

Does the project require any other Policy waiver(s)?

Yes No



INSTITUTIONAL DATA

Practice Area (Lead)

Urban, Resilience and Land

Contributing Practice Areas

Climate Change and Disaster Screening

This operation has been screened for short and long-term climate change and disaster risks

PROJECT TEAM

Bank Staff

Name	Role	Specialization	Unit
Simone Lillian Esler	Team Leader (ADM Responsible)		SEAU1
Andrew James Hurley	Team Leader	Municipal Engineer	SEAU1
Cristiano Costa e Silva Nunes	Procurement Specialist (ADM Responsible)	Procurement	EEAR2
Ha Thuy Tran	Financial Management Specialist (ADM Responsible)	Financial Management	EEAG2
Bonnie Frances Cavanaugh	Environmental Specialist (ADM Responsible)		SEAE1
Michelle Marie Dooley	Social Specialist (ADM Responsible)	Social Safeguards	SEAS1
Katherine Baker	Team Member	Operational Support	SEAU1
Mei Wang	Team Member	Legal	LEGAS
Miguel Payawal Ferido	Team Member		EACNF
Minghe Zheng	Team Member	Disbursement	WFACS
Natalia Latufangahea Hehenga Latu	Team Member	Liason Officer	EACNF
Nicholas Gerard Williams	Procurement Team		EACNF

Extended Team

Name	Title	Organization	Location
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I. BACKGROUND AND RATIONALE FOR ADDITIONAL FINANCING

1. This Project Paper seeks the approval of the Executive Directors to provide an additional grant in the amount of SDR 3.8 million (equivalent to US\$5 million) to the Pacific Resilience Project (PREP) in Tonga (P154840) as part of the Pacific Resilience Program, a “Series of Project”(SOP), from the International Development Association (IDA) Crisis Response Window (CRW). Though the proposed Additional Financing (AF) will support the Government of Tonga (GoT) in responding to the Hunga Tonga-Hunga Ha’apai (HT-HH) volcanic eruption and subsequent tsunami which struck Tonga on January 15, 2022, the AF will only cover the financing gap identified for delivery of critical activities to strengthen early warning and preparedness for natural disasters.
2. The project will also require a Level II restructuring to: (i) extend the closing date of the IDA financing (IDA 56890-TO, IDA D0780-TO, IDA D359-TO), and trust funds (TF0A7818 and TF-A0900) to April 30, 2025; and (ii) revise the targets and delivery dates of the Results Framework indicators for Component 1 and Component 2 to reflect changes to the targets as discussed and agreed with the Government in November 2021.
3. **Country Context.** Tonga consists of 169 islands in the South Pacific with a total population of around 105,000. Tonga’s small size, geographic dispersion and isolation, as well as limited natural resources, provide a narrow economic base and make the country extremely vulnerable to external shocks. Agriculture, fishing, and tourism account for most export earnings and are critically exposed to external events offshore. There is a high dependency on consistent external aid (approximately 15 percent of Gross National Income, GNI). Remittances from an estimated 100,000 Tongans abroad have historically been equivalent to about 30 percent of GNI, increasing Tonga’s vulnerability to any international crisis impacting remittances, such as the COVID-19 pandemic.
4. Tonga is one of the world’s most exposed countries to climate change and natural disasters. It is ranked the third most at-risk nation in the world to natural hazards, due to its exposure to extreme natural events and the high level of societal vulnerability. The country’s vulnerability is primarily due to its geographical isolation and geological and socio-economic characteristics; consequently the multiple effects of climate change pose significant threats to infrastructure, resources and human health.¹ This, coupled with its susceptibility to natural hazards and adverse weather events such as tropical cyclones, sea level rise, storm surges, drought, flooding and volcanic eruptions, makes the country vulnerable to current and future climate events. Each of these hazards, bar volcanic eruptions, are being compounded by the impacts of climate change, resulting in the higher frequency and intensity of adverse events.
5. In recent years, Tonga has been hard-hit by several economic and natural shocks, which have eroded its fiscal buffers and capacity to respond to further shocks. Tropical Cyclone (TC) Gita struck Tonga on

¹ World Bank Climate Change Knowledge Portal, Tonga Dashboard.



February 12, 2018, as a Category 4 TC, and caused damages equivalent to around 38 percent of Tonga's gross domestic product (GDP). TC Harold struck on April 9, 2020, resulting in significant damages and losses totaling at least 12 percent of GDP. The HT-HH volcanic disaster on January 15, 2022, is estimated to have caused physical damages and economic losses of at least US\$182 million (36.4 percent of GDP).

Summary information on the Parent Project

6. **Project Background.** The Pacific Resilience Program is a 'Series of Projects', which spans two phases. The regional approach of the Program is helping Pacific Island Countries (PICs) to: (i) strengthen early warning and preparedness; (ii) create a framework for stronger and prioritized investments in resilience and retrofitting of key-public assets to meet internationally recognized resilience standards; and (iii) improve the post-disaster response capacity of the countries through strengthened financial resilience to disaster events. The Parent Project in Tonga is a part of the first phase Pacific Resilience Program.
7. The IDA, GEF, and Global Facility for Disaster Reduction and Recovery (GFDRR) funding for the Parent Project was approved on June 19, 2015, became effective on November 16, 2015, and had an original closing date of November 30, 2020. The PREP funding originally totaled US\$16.25 million (US\$4.5 million national IDA (grant) financing, US\$6.0 million national IDA (credit) financing, US\$1.5 million GFDRR financing, US\$4.58 million GEF financing, and US\$0.18 million government contribution). The PREP was restructured in October 2017 to facilitate payment of the insurance premia under Component 3 of the original project directly to an eligible insurer (the Pacific Catastrophe Risk Insurance Company, PCRIC), rather than through the World Bank Treasury, as requested by the other countries in the first phase of the Pacific Resilience Program (Vanuatu, Tonga, Samoa and Republic of Marshall Islands). An Additional Financing (AF) and second restructuring was approved on June 26, 2018, to support climate and disaster resilient recovery of schools that were impacted by TC Gita (which struck in February 2018) under Component 2, and to extend the duration of disaster risk insurance premiums from three years of coverage to a total of eight years of coverage under Component 3. The closing date of the project was extended to October 31, 2023.
8. **Parent Project Financing:** The Parent Project currently includes total financing of US\$34.07 million from the following financing sources:
 - *IDA: US\$25.45 million*
 - a. US\$4.5 million in IDA Credit (5689-TO) from original Project in 2015.
 - b. US\$6 million in regional IDA grant (D078-TO) from original Project in 2015.
 - c. US\$13.1 million in IDA Grant and US\$1.85 million (D359-TO) in Regional IDA grant from the AF in 2018.
 - *Trust Fund Grants: US\$8.04 million*
 - a. US\$1.5 million from the GFDRR/Japan (TF-A1232) from the Original Project in 2015, which closed on June 30, 2020.



- b. US\$4.58 million from Global Environment Facility (TF-A0900) from the Original Project in 2015.
 - c. US\$1.96 million from Australian Government (TF-0A7818) as part of the AF in 2018.
- *Government Contribution.* US\$0.58 million from the Government (US\$0.18 million from the original Project in 2015 and US\$0.4 million from the AF in 2018).

The closing dates of all the current grants (IDA 56890-TO, IDA D359-TO, IDA D0780-TO, TF0A7818 and TF-A0900) will be extended to align with the new proposed project closing date of April 30, 2025.

9. **Project Development Objective (PDO).** The PDO is to strengthen early warning, resilient investments and financial protection of Tonga.
10. **Implementation Arrangements.** The Ministry of Meteorology, Energy, Information, Disaster Management, Environment, Climate Change, and Communications (MEIDECC) is responsible for the overall implementation of the project, and is the implementing agency for Components 1, 2 and 4. The Ministry of Finance (MOF) is the implementing agency responsible for Component 3.
11. **Implementation Progress.** The Parent Project has made significant progress despite the challenges of implementation during an extended and ongoing period of closed borders due to the COVID-19 global pandemic since March 2020. As of May 10, 2022, disbursement was 72 percent, though 82 percent of the project's implementation period has elapsed. The Parent Project includes four components: (i) Strengthening Early Warning and Preparedness; (ii) Risk Reduction and Resilient Investments; (iii) Disaster Risk Financing; and (iv) Project and Program Management. The progress of each component is summarized below:
 - a) **Component 1: Strengthening Early Warning and Preparedness.** Implementation progress of Component 1 is currently rated Moderately Satisfactory. Key progress to date includes an extensive program of training and capacity building for the Tonga Meteorological Service (TMS), the National Emergency Management Office (NEMO) and the Natural Resources Division (NRD). The Ha'apai and Vava'u Emergency Operations Centre were completed in November 2020 and March 2021 respectively. Key activities which are underway and are expected to be delivered prior to the proposed extended closing date include: (i) Delivery of the Multi-Hazard Early Warning System (MHEWS), for which the TMD, NEMO and NRD have continued to collaborate with the System Integrator Consultant (SIC) for the development of the Concept of Operations and design; (ii) Delivery of the Multi-hazard Early Warning Centre, for which a design firm has been engaged to re-design the building, after the previous designs (prepared outside of the Parent Project and funded by another donor) were not fit for purpose; (iii) The Marine Communications System, for which the technical specifications and bid documents have been prepared for Phase 1 of the system, with procurement due to commence in July of 2022, while Phase 2 of the system will be aligned with delivery of the Multi-hazard Early Warning Centre; and (iv) The Seismic and Volcano Observation Equipment, for which the draft design, technical specifications, and costed



Bill of Quantities (BOQ) are under preparation, with procurement expected to commence by the close of 2022.

- b) **Component 2: Risk Reduction and Resilient Investments.** Implementation of Component 2 is currently rated as Moderately Satisfactory. Classroom construction works at 25 school sites have been completed, including a total construction of 88 new classrooms in 33 new buildings, and retrofitting and repairs for 37 classrooms in 10 existing buildings. New Water, Sanitation and Hygiene (WASH) facilities at 21 schools have also been completed.
- c) **Component 3: Disaster Risk Financing.** Progress of Component 3 is currently rated as Moderately Satisfactory. A Contingent Emergency Response Component (CERC) was triggered in 2018, which supported the Government's response to Tropical Cyclone Gita through the procurement of critical emergency response equipment and stockpiles. The Parent Project has continued to provide support for the Disaster Risk Financing strategy. The PCRIC insurance premium of US\$590,000 (of which US\$90,000 is funded by government co-financing) for November 2021-October 2022 has been paid.
- d) **Component 4: Project and Program Management.** Implementation of this component is currently rated as Satisfactory, with a well-functioning and fully staffed Project Management Unit.

12. **Financial Management (FM).** FM is currently rated as Moderately Satisfactory. There are currently no overdue Interim Financial Reports (IFRs) and audit reports. FM Reporting is generally acceptable to the Bank, though the submission is often delayed. There are several FM recommendations from the latest mission and Audit Management Letter that the Project Management Unit, together with the FM support from Central Services Unit (CSU), are required to implement including: (i) strengthening the bank account reconciliation process to ensure timely documentation and closure of Project accounts; (ii) timely updating of Project contract management and asset register; and (iii) timely implementation of all Bank and auditor recommendations.

13. **Procurement.** Procurement is currently rated as Moderately Unsatisfactory. After 81 months (almost seven years) of implementation, MEIDECC's Project Management Unit (PMU) has procured 73 different contracts costing the equivalent of US\$21 million, of which civil works contracts represent almost 70 percent. Lack of effective work planning has impacted the PMU's ability to plan its procurement effectively. In 2018, the PMU started to use STEP and between March 15, 2018, to February 03, 2022, the PMU's plan has had 46 different versions, i.e., the PMU altered its procurement on average once a month. This shortcoming contributed to 44 percent of the value contracted in an untimely manner, i.e., after the PMU's schedule signed date. This also caused considerable transaction costs to the PMU: a total of 23 activities estimated at US\$12.7 million were added to the plan only to be later canceled. The PMU's Project Procurement Strategy for Development (PPSD) has identified this risk and the PMU continues to work with MOF's CSU to improve the quality of the project's work program and budget. The PMU's current procurement plan has three activities estimated at US\$1 million. Two activities are "under implementation": Marine Communication Equipment and the PMU's Contracts Manager. The implementation of both is behind schedule and the finalization of the technical specifications for the



communication equipment has been identified as the bottleneck; the Bank has provided significant feedback to the PMU to expedite the finalization of specification. The procurement of Seismic Equipment is scheduled to start in July 2022.

14. **Environmental and Social Safeguards.** Safeguards are currently rated as Satisfactory. The PMU has an experienced Safeguards Officer in place who undertakes regular compliance audits and follows up with robust reporting on issues. This officer has also been involved in quality assurance (QA) close out reports, which has improved her knowledge of Operational Health and Safety (OHS). Current issues on the project relate to contractor non-compliance with Personal Protective Equipment and OHS (such as site fencing); and a requirement for additional contractor training and inductions not being carried out as required. The schools design and supervision firm has failed to collect records to confirm that OHS and Gender Based Violence plus SEA/SEA/VAC training is occurring as planned. The CSU Safeguard Specialist will update the Contractors Environmental and Social Management Plan (CESMP) templates to strengthen requirements and expectations, while the PMU Safeguards Officer has undertaken a gap analysis on training and inductions. The PMU Safeguards Officer has continued to work on the QA review for school WASH facilities. Several site assessments are currently being completed, including assessment updates for those sites where the location has changed slightly. The PREP Grievance Redress Mechanism (GRM) is operational, though feedback is being submitted to the Ministry of Education and Training, rather than to the PMU. The PMU Safeguard Officer is liaising with TMS to collect this feedback and will send it to the World Bank. More information on site signage would be useful to direct the community to the GRM.

Rationale of Additional Financing

15. A financing gap has been identified by the Government for several key activities under Component 1 and for the necessary Project Management support under Component 4. In the past two and a half years, the COVID-19 pandemic has impacted the cost of works and the timelines for works activities due to country-wide shut-down periods, material shortages, price escalations and interruptions to global supply chains. Associated delays to construction timelines have led to increased supervision costs. Rising global commodity prices due to the war in Ukraine are likely to further exacerbate price escalations. Since January 2022, implementation delays have been compounded by the HT-HH volcanic eruption and the associated tsunami, as well as Tonga's first COVID-19 outbreak.
16. The financing gap is due to the continued escalation of the costs of works due to the COVID-19 pandemic, and additional costs linked to the delays in the design of the MHEWS building (necessitating the phasing of activities across multiple MHEWS procurements at increased costs). Increased cost estimates for the Marine Communications System, the Seismic Monitoring System and the Volcanic Monitoring System have indicated a financing gap for the procurement and installation of highly specialized MHEWS equipment, which is being further exacerbated by interruptions to global supply chains and ongoing travel restrictions due to the COVID-19 pandemic. The additional financing will support the Government to deliver the planned activities under Component 1, in accordance with the original objectives of the PREP Tonga (P154840) and will ensure that the PMU is able to support project implementation for an additional 18 months through to the extended project closing date of April 30, 2025.



Higher Level Objectives to which the Project Contributes

17. The proposed AF is aligned with the Tonga Strategic Development Framework (TSDFI) and associated policies and plans for more inclusive and sustainable: (i) infrastructure resilient to climate change and extreme events; and (ii) human development with gender equality. The proposed AF is also aligned with the World Bank's framework for supporting green, resilient, and inclusive development (GRID) in IDA and IBRD countries, and supports the three pillars of GRID: (i) Green Development, through sustainable infrastructure investments in public facilities; (ii) Resilient Development, through support for risk identification, reduction and management of residual risk, including support for the two emergency operations centers and an enhanced MHEWS; and (iii) Inclusive Development, through the support for vulnerable groups (including women and children) through gender and accessibility sensitive investments to support MHEWS. The proposed AF is consistent with the World Bank's Pacific Islands Regional Partnership Framework (FY17-FY23)² covering nine Pacific Island countries: Kiribati, the Republic of the Marshall Islands (RMI), Federated States of Micronesia (FSM), Republic of Nauru, Republic of Palau, Independent State of Samoa, Kingdom of Tonga, Tuvalu, and Vanuatu. It is in line with Focus Area 3 of the Regional Partnership Framework: *Protecting incomes and livelihoods*, through its contribution to the achievement of *Objective 3.1: Strengthened resilience to natural disasters and climate change*. The project also aims to ensure strong liaison with other development partners, thus avoiding duplication of ongoing efforts and collaborating where possible.

II. DESCRIPTION OF ADDITIONAL FINANCING

18. The proposed AF will support an identified financing gap under Component 1: Strengthening Early Warning and Preparedness, and a financing gap under Component 4: Project and Program Management, due to the extended closing date of 18 months. The proposed AF will ensure that the project meets the PDO. No changes are required to the PDO, though changes are proposed to the results framework as detailed below.

Component 1: Strengthening Early Warning and Preparedness

19. The AF will finance the identified funding gap for the following activities, all of which are within the existing scope of the Project:

Sub-component 1.1.1: Institutional and regulatory strengthening, capacity building and implementation support

20. This sub-component supports carrying out a program of activities designed to strengthen the institutional and regulatory framework for the exchange of data and information critical for the

² World Bank. 2020. Nine Pacific Island Countries (PIC9): Kiribati, Nauru, Marshall Islands, Federated States of Micronesia, Palau, Samoa, Tonga, Tuvalu and Vanuatu - Performance and Learning Review for the Period FY2017 – 2021 (Report Number 100997-EAP). The Performance and Learning Review of the RPF for the PIC9 (Report No. 145750-EAP) extended the RPF period from FY21 to FY23



implementation of impact forecasts and warning services, including strengthened capacity to ensure the operability of the future systems, and to support Project design and implementation.

21. A US\$0.12 million financing gap has been identified for the following activities:
- a) US\$0.03 million for the development of a new Geohazards Act, amendments to the Communications Act and related stakeholder consultations.
 - b) US\$0.09 million for capacity building for NEMO, TMS and NRD staff.

Sub-component 1.1.2: Modernization of the Observation Infrastructure, Data Management Systems, Forecasting and Warning Systems

22. This sub-component carries out a program of activities designed to modernize the observation infrastructure, data management systems, the warning and emergency operational centers, and forecasting, warning and disaster management systems.

23. A total financing gap of US\$3.50 million has been identified for the following activities:
- a) US\$1.15 million for the upgrade of observation infrastructure, including upgrade of the seismic network, volcano, groundwater and earthquake monitoring.
 - b) US\$0.75 million for the upgrade of data management, communication, and ICT systems, including the marine and community communication infrastructure and computer equipment to improve High Frequency and Very High Frequency radio network communications; data management systems capable of fully integrating all sources of data, including existing and future national observation networks, and forecast products; and continued strengthening of AM Radio communications and MHEWS.
 - c) US\$1.6 million for the construction of TMS/NEMO's National Multi-hazard early warning center.

Sub-component 1.1.3: Enhancement of the MHEWS Service Delivery System

24. This sub-component will improve service delivery by enhancing the existing early warning systems. This will be achieved by carrying out a program of activities designed to improve service delivery by enhancing the existing early warning system.

25. A total financing gap of US\$0.63 million has been identified for the strengthening and expansion of the MHEWS services and impact-based forecasting, which includes developing, improving and operationalizing new public weather information services, improving the means of delivering services to communities and individuals, and the development of Standard Operating Procedures.

26. **Under the AF, Component 4: Project and Program Management** will finance the funding gap of US\$0.75 million for Project Management costs associated with the extended project duration and cost over runs.



This component will be re-named from “Project and Program Management” to “Project Management,” to ensure consistency with the financing agreement, and to more accurately reflects the activities under this component, which relate to management of the Tonga PREP, rather than management of the broader Pacific Resilience Program.

27. **Implementation Arrangements.** There are no proposed changes to the implementation arrangements.
28. **Financing.** Section VII: Detailed Changes indicates the current and revised component costs because of the proposed AF; these are broken down below. The AF will increase the costs of Component 1 and Component 4 from US\$11.50 million to US\$15.74 million and US\$1.5 million to US\$2.25 million.

Table 1: Project Costs and Financing by Component

Component	Parent Project (US\$ million)	Proposed AF (US\$ million)	Total (US\$ million)
Component 1 – Strengthening Early Warning and Preparedness	11.49	4.25	15.74
1.1.1 Institutional and regulatory strengthening	1.11	0.12	1.23
1.1.2 Modernization of the observation infrastructure	9.03	3.50	12.53
1.1.3 Enhancement of the MHEWS Service Delivery System	1.35	0.63	1.98
Component 2 – Risk Reduction and Resilient Investments	15.50	0.00	15.50
Component 3 – Disaster Risk Financing	5.40	0.00	5.40
Component 4 – Project Management	1.50	0.75	2.25
Total	33.89	5.00	38.89

29. **Closing Date.** The Project has suffered implementation delays, due to the COVID-19- global pandemic, which has impacted timelines for works and technical activities due to travel restrictions for inbound flights to Tonga since March 2020, country-wide shut-down periods, material shortages, and interruptions to global supply chains. Since January 2022, implementation delays have been compounded by the HT-HH volcanic eruption and associated tsunami and Tonga’s first COVID-19 outbreaks. Accordingly, the closing date will be extended by 18 months, to April 30, 2025, to accommodate the additional time needed to deliver key activities under Component 1, in particular the completion of the Multi-hazard Early Warning Centre and the marine communications infrastructure.
30. **Results Framework.** Changes are proposed to the Results Framework to provide improved clarity and reflect the current targets for project activities. The detailed description and rationale for changes is provided in Section VIII. In summary, the changes are as follows:

a) PDO Indicators:

- i. *Minor changes.* Revisions to the wording of two PDO indicators are proposed to provide enhanced clarity and purpose of the indicators.



- ii. *Deletion.* A third indicator is marked for deletion, as it duplicates what is being measured in another PDO indicator.

b) Intermediate Indicators:

- i. *Component 1.* Deletion proposed for the current two intermediate indicators, which will be replaced by new, more specific indicators which provide additional clarity on the activities being measured under Sub-components 1.1.1 (Institutional and regulatory strengthening, capacity building and implementation support), 1.1.2 (Modernization of the Observation Infrastructure, Data Management Systems, Forecasting and Warning Systems) and 1.1.3 (Operational Support for MHEWS Service Delivery System).
- ii. *Component 2.* Amendments proposed for the end target of two intermediate indicators to reflect the pivot during implementation towards less retrofitting/repairs, and more new construction (including for WASH facilities). A proposed amendment to a third indicator will provide enhanced clarification on what is being measured.
- iii. *Component 3.* no changes proposed.
- iv. *Component 4.* New intermediate indicator proposed to measure effectiveness of the GRM.

31. **Gender.** Women are more likely than men to be negatively impacted by climate change and natural disaster events (World Development Report, 2012). Studies have shown that disaster fatality rates are much higher for women than for men. This gendered asymmetry in vulnerability to disaster risk is primarily due to geographic, economic, social, educational/informational and political power imbalances across all levels.³ While women have a higher vulnerability to climate-based disasters, they also play an important role in community level efforts to minimize the risks, including in community early warning and preparedness. Accordingly, women will play a critical role in disaster risk reduction strategies promoted by the project. Under the AF, gender empowerment activities will continue to be conducted in communities where women's voices within the decision-making process are to be heard. The project will continue to strengthen the ability of women to make informed decisions on protecting themselves and their families from hazards. Furthermore, the project will continue to help emergency services to target limited resources towards where they are most needed, to maximize the impact of their response efforts. The project will continue to ensure women's representation in decision making via consultations. Monitoring indicators will be gender disaggregated where feasible.⁴

³ Aguilar, L. et al. 2009, *Training Manual on Gender and Climate Change*, International Union for Conservation of Nature (IUCN), United Nations Development Programme (UNDP) and Global Gender and Climate Alliance (GGCA), San Jose, Costa Rica.

⁴ Gender considerations will refer to the relevant literature, specific to the vulnerability of women during disaster events, including the World Bank documents: Rex, Helene Carlsson and Trohanis, Zoe. 2012. *Making women's voices count: integrating gender issues in disaster risk management: overview and resources for guidance notes*. Washington, DC.; *Girls in Disasters* (2013) and World Bank Country Gender Action Plans for Tonga and Samoa (2012-2016).



32. **Climate Change and Climate Co-Benefits.** The Parent Project was screened for short- and long-term climate and disaster risks. The AF will support the reduced vulnerability of the entire country to disaster risk and climate change impacts, including more frequent adverse weather events (such as changes in precipitation, increased flooding, more intense storm events and tropical cyclones). Specifically, Component 1 investments under the AF will reduce disaster and climate vulnerabilities from more frequent adverse weather events and contribute to climate resilience through adaptation and mitigation. It will contribute to climate resilience and adaptation through: i) the construction of a climate and disaster resilient multi-hazard early warning center for Tonga; ii) improved monitoring capacity for groundwater resources, which will allow the GoT to better understand and model the impacts of climate change on groundwater; and iii) improved MHEWS to prepare and warn communities about climate and disaster risks. The scale up will also contribute to climate mitigation through the use, where feasible, of contextually appropriate renewable energy sources, passive cooling options, and energy efficiency for the construction of the new multi-hazard early warning center.
33. **Citizen Engagement.** The activities and indicators related to Citizen engagement under the Parent Project remain unchanged.

III. KEY RISKS

34. The overall risk rating and the ratings of each risk category in the Systematic Operations Risk rating Tool table remain unchanged from the Parent Project; the overall risk rating is Moderate. No risks are rated as higher than Moderate for this AF or the Parent Project, apart from institutional capacity for implementation and “Other” risks. Mitigation measures proposed to strengthen institutional capacity for implementation include continued utilization of the PMU, and support from the CSU established within the Ministry of Finance. With regards to “Other” risks, there are two key areas of other risks for the project:
- a) *Disaster events.* The Pacific region is hazard-prone and is renowned for the frequent occurrence of disasters. There is the potential for further disasters to impact Tonga during the extended life of the project. In such a situation, the attention of the implementing agencies could easily be diverted from the long-term resilience agenda advocated by the PREP, to the immediate disaster response and recovery needs of the country. To mitigate these risks, a well-functioning PMU has been created and is currently operational; it will continue to oversee the day-to-day implementation of the project on behalf of the government in the event of a disaster event. Additionally, a Contingency Emergency Response Component (CERC) remains incorporated in the design of the Parent Project. It was triggered following TC Gita to support immediate recovery needs and will remain in place for use if necessary.
 - b) *COVID-19 Global Pandemic.* Tonga is currently experiencing its first wave of domestic transfer of COVID-19 and has experienced intermittent lockdowns during 2022. Tonga’s international border has been closed to non-essential travel since March 2020, and at the time of appraisal, there was no clear timeframe in the immediate term for re-opening the borders. Regional suppliers (for



example, those based in Australia or New Zealand) have been and may continue to be impacted by the restricted borders, impacting operations at local ports, and interrupting supply chains. The COVID-19 pandemic is expected to create continued challenges due to restrictions on travel, site visits and meetings by personnel inside and outside of Tonga. To mitigate these impacts during Project implementation, virtual meetings, missions, and consultations will continue to be held when necessary. Local contractors will be used wherever feasible. Project planning will be cognizant of the ongoing travel restrictions, and risk mitigation measures will continue to be identified by the PMU and implemented for all project contracts to limit the impact of travel restrictions and supply chain issues on project implementation.

IV. APPRAISAL SUMMARY

A. Economic and Financial Analysis

- 35. **Component 1.** An indicative cost-benefit analysis was conducted to inform project updates. The additional financing supports the strengthening of early warning and meeting a corresponding financing gap under Component 4 (Project and Program Management). The economic benefits quantified in this analysis are based on the savings in damages and losses estimated to accrue during a natural disaster. Accounting for casualties converted into the value of statistical life would imply higher benefit-cost ratios. The project activities will benefit the most vulnerable and impoverished communities by strengthening early warning of natural disaster occurrences and supporting the financial capacity of the Government’s preparedness to respond and rebuild promptly following a disaster.
- 36. The cost-benefit analysis aims to estimate the economic internal rate of return (EIRR), net present value (NPV), cost-benefit ratios of the AF of Component 1 in the short to medium term based on a set of assumptions, and the evaluation of Scenario 1 (without AF) and Scenario 2 (with AF). The economic analysis is performed using a 7.83 percent⁵ discount rate over five years, based on the opportunity cost of capital and country risk. The estimated benefits are from the Project Appraisal Document Pacific Resilience Program (PAD1095).
- 37. Table 2 shows that the net present value of Component 1 AF is positive and will yield greater social and economic benefits to Tongan communities. The EIRR reveals that the decision-makers should proceed with the AF of Component 1. The AF will enable Tonga to create a sustainable early warning system, integrate information for easier distribution, and strengthen preparedness for natural disasters.

Table 2: Results of the Cost-Benefit Analysis

Description	Costs (US\$ Million)	Benefits (US\$ Million) per Year	NVP (US\$ Million)	EIRR (percent)	PI
Component 1	16.82	80.1	250.57	509	16.92

⁵ The discount rate is taken from the World Bank most recent value for Tonga.



The estimate of the benefit-cost ratio of Scenario 1 (without AF) and Scenario 2 (with AF) of 6.51 and 5.09 respectively suggest that both scenarios deliver a positive net present value; see Table 3 below. Although the Scenario 2 ratio is less than that of Scenario 1, the comparative benefit-cost ratio of 1.24 recommends the choice of Scenario 2 due to the higher benefits when accounting for avoided casualties, prevented damages and losses (public buildings, private assets), the value of statistical life, and avoided illness. Scenario 2 yields greater benefits with green, resilient, and inclusive development described in Component 1 additional financing.

Table 3: Estimation of Scenarios

Scenario	Costs (US\$ Million)	Benefits (US\$ Million) per Year	Cost-Benefit Ratio
Scenario 1 Without AF	11.49	74.8	6.51
Scenario 2 With AF	15.74	80.1	5.09
Comparison of the two scenarios	4.25	5.3	1.24

B. Technical

- 38. The objective of Component 1: Strengthening Early Warning and Preparedness is to increase the resilience of Tonga to natural hazards such as cyclones, coastal/riverine flooding, volcanoes, tsunamis and earthquakes by improving the quality of forecasting and warning services. The technical design of Component 1 addresses: (i) institutional and regulatory strengthening, capacity building and implementation support; (ii) modernization of the observation infrastructure, data management systems, forecasting and warning systems; and (iii) enhancement of the MHEWS service delivery system. The technical design also includes provisions for the necessary ongoing operational and maintenance requirements to ensure the sustainability of the MHEWS.
- 39. The Systems Integrator Consultant (firm), the Multi-hazard early warning center design consultants (firm) and an individual consultant for the Marine Coast Radio Stations and seismic system hired under the project are working with the government to progress the MHEWS and will continue to support the technical design of this component through to the completion of relevant activities. The Parent Project also has a cross-ministerial Technical Working Group (TWG) which meets regularly to provide technical inputs to project activities. Support from the TWG will continue through to the completion of project activities. The Parent Project has had a significant focus on capacity building to ensure the sustainability of investment outcomes. There will be ongoing support for capacity building and operations and maintenance for all equipment and infrastructure developed under this project.
- 40. As per the Parent Project, the technical quality and relevance of the Program activities will be insured through several measures. These include the provision of investments in strengthening early warning and preparedness systems, which will continue to be based on a needs assessment and modernization plan developed for the Parent Project by an international and regional team of experts. The proposed investments follow current good practice and World Meteorological Organization recommendations for providing early warning services and disaster impact forecasting.



C. Financial Management (FM)

41. An assessment of the FM arrangements for the proposed Project AF concluded that the Project meets the World Bank's FM requirements, as stipulated in World Bank Policy/Directive on Investment Project Financing. The Project is required to maintain sound financial management systems – including accounting, financial reporting, and auditing systems – that are adequate to ensure that they can provide the Bank with accurate and timely information regarding the project resources and expenditures, and that the Project funds are used for intended purposes.
42. The financial management assessment of proposed Project AF had identified the principal FM risk to be the risk of errors and misuse of funds due to the extensive use of spreadsheets to record and report project transactions of both original and additional financing, as well as the limited FM capacity of MEIDECC. To mitigate these FM risks, the PMU has engaged a finance officer. The MOF CSU will continue to provide close support and training to the Finance Officer. An accounting software package will continue to be used for all project reporting and reconciliations, and to reduce the use of spreadsheets. MEIDECC, PMU, CSU, and MOF will meet regularly to identify opportunities to integrate the project FM arrangements in the existing Government of Tonga systems and processes, such for budgeting, contract management, asset management, and reporting.
43. The identified FM mitigating measures during the review were: (i) continued employment of a Project Accountant dedicated to maintaining the day-to-day accounting records of the project; and (ii) maintaining the project accounts on an accounting software, which is the current financial information system used by the Government, i.e., Sun Systems. The project enters transactions directly into Sun Systems and project accounts are segregated through the chart of accounts. The project internal controls systems and authorizations are consistent with those of the Government and are formalized in the Project Operational Manual (POM), detailed in the FM chapter. The current arrangements are adequate and no changes to the Financial Management arrangements are envisaged for the additional financing.
44. **Project Disbursement and Fund Flow arrangements.** There are no changes to the Project Fund Flow and Disbursement arrangements for the proposed AF. Following MOF requirement, the AF funds will flow to a Pooled Project Designated Account (DA) in local currency, which is already opened in the Bank of South Pacific Tonga Limited under the original financing for IDA Credit 5689-TO, IDA Grant D078-TO and IDA D3590-TO. A separate general ledger shall be kept for this AF to record funds receipt and disbursement. The ceiling of each DA will be determined and documented in the Disbursement Letter. The project funds will be disbursed against eligible expenditures as set out in the legal agreements. The following four disbursement methods are all available for the proposed AF Project: (i) advance; (ii) reimbursement; (iii) direct payment; and (iv) special commitment. Supporting documents required for Bank disbursement under the different disbursement methods are documented in the Disbursement Letter issued by the World Bank, based on Statements of Expenditures, Lists of Payments, and records evidencing eligible expenditures. The disbursement deadline for the proposed AF will be four months after the Project AF closing date. Due to the outstanding balance in the existing DAs opened in USD under IDA Credit 5689-TO and TFOA0900 have not been refunded to the Bank in a timely manner, Advance Disbursement



Method and the use of the DA will not be available to this project until the above-mentioned outstanding balance is refunded to the Bank.

The AF resource allocation by Disbursement category is show in Table 4 below. To the extent practical, funds from IDA Credit 5689-TO, IDA D3590-TO and TFA0900 shall be exhausted first before funds from this IDA grant is utilized.

Table 4: Disbursement Category Allocations for the AF

Category	Amount of Financing Allocated (Expressed in USD)	Amount of Financing Allocated (Expressed in SDR)	Percentage of Expenditures to be financed (inclusive of taxes)
(1) Goods, works, non-consulting services, consulting services, training and Incremental Operating costs for Part 1 and 4 of the Project	5,000,000	3,800,000	100%
Total amount	5,000,000	3,800,000	

D. Procurement

45. As per the Parent Project, Procurement under the proposed AF will follow the procedures specified in the “World Bank Procurement Regulations for IPF Borrowers (November 2020)”. The PMU will oversee all procurement implementation related to the AF. The Parent project has an existing Project Procurement Strategy for Development (PPSD) and the Procurement Plan (PP), and these will be updated by June 20, 2022. The project’s largest investments will be in the construction of the TMS/NEMO Building. Tonga’s contracting industry has structural limitations, while foreign contractors are unlikely to be interested due to the high mobilization costs. To mitigate the associated risks, the PMU will take a proactive approach to promote this opportunity and ensure that the works are packaged in a way that is commensurate with the local contractors’ capacity. The PMU’s capacity will be augmented by: (i) the employment of an Engineering Firm to design (including the preparation of procurement documents) and supervise civil works activities; and (ii) MOF’s CSU providing hands-on implementation support.

E. Social (including Safeguards)

46. Social risks for the AF remain the same as in the Parent Project. The overall social impact of the project and AF is expected to be positive, and none of the eligible investments in the menu of options include activities that would generate significant risk or irreversible adverse social impacts. The main social impacts for eligible activities are minor impacts from the construction and rehabilitation of small-scale



infrastructure (e.g., buildings for national disaster management or meteorological offices). The scale and likelihood of adverse impacts arising from these activities is limited, and the types of mitigation measures are well-known and proven. Social risks will continue to be managed under the existing environmental and social management framework (ESMF) for the project, which requires that any potential adverse social environmental impacts that are generated as a result of sub-project activities are identified, and appropriate safeguard instruments are prepared to avoid, minimize, mitigate and, in such cases where there are residual impacts, offset these impacts. Given that the AF will not add any new activities or create new social risks, there is no requirement to update the ESMF.

F. Environment (including Safeguards)

47. Environmental risks for the AF remain the same as for the Parent Project. The overall environmental impacts of the project and the AF are expected to be positive, and none of the eligible investments in the menu of options include activities that would generate significant risks or have irreversible adverse environmental impacts. The main environmental impacts for eligible activities are minor impacts from the construction and rehabilitation of small-scale infrastructure (e.g., buildings for national disaster management or meteorological offices). The scale and likelihood of adverse impacts arising from these activities is limited, and the types of mitigation activities are well-known and proven. Environmental risks will continue to be managed under the existing ESMF for the project, which requires that any potential adverse environmental impacts that are generated because of subproject activities are identified, and appropriate safeguard instruments are prepared to avoid, minimize, mitigate and, in such cases where there are residual impacts, offset these impacts. Given that the AF will not add any new activities or create new environmental risks, there is no requirement to update the ESMF.

V. WORLD BANK GRIEVANCE REDRESS

48. Communities and individuals who believe that they are adversely affected by a World Bank supported project may submit complaints to existing project-level grievance redress mechanisms or the World Bank's Grievance Redress Service. The Grievance Redress Service ensures that complaints received are promptly reviewed in order to address project-related concerns. Project affected communities and individuals may submit their complaint to the World Bank's independent Inspection Panel which determines whether harm occurred, or could occur, as a result of World Bank non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the World Bank's attention, and Bank Management has been given an opportunity to respond. For information on how to submit complaints to the World Bank's corporate Grievance Redress Service, please visit <http://www.worldbank.org/en/projects-operations/products-and-services/grievance-redress-service>. For information on how to submit complaints to the World Bank Inspection Panel, please visit www.inspectionpanel.org.

**VI. SUMMARY TABLE OF CHANGES**

	Changed	Not Changed
Results Framework	✓	
Components and Cost	✓	
Loan Closing Date(s)	✓	
Implementing Agency		✓
Project's Development Objectives		✓
Cancellations Proposed		✓
Reallocation between Disbursement Categories		✓
Disbursements Arrangements		✓
Safeguard Policies Triggered		✓
EA category		✓
Legal Covenants		✓
Institutional Arrangements		✓
Financial Management		✓
Procurement		✓

VII. DETAILED CHANGE(S)**COMPONENTS**

Current Component Name	Current Cost (US\$, millions)	Action	Proposed Component Name	Proposed Cost (US\$, millions)
Component 1: Strengthening Early Warning and Preparedness	11.49	Revised	Component 1: Strengthening Early Warning and Preparedness	15.74
Component 2: Risk Reduction and Resilient Investments	15.50	No Change	Component 2: Risk Reduction and Resilient Investments	15.50
Component 3: Disaster Risk	5.40	No Change	Component 3: Disaster	5.40



Financing			Risk Financing	
Component 4: Project and Program Management	1.50	Revised	Component 4: Project Management	2.25
TOTAL	33.89			38.89

LOAN CLOSING DATE(S)

Ln/Cr/Tf	Status	Original Closing	Current Closing(s)	Proposed Closing	Proposed Deadline for Withdrawal Applications
IDA-56890	Effective	30-Nov-2020	31-Oct-2023	30-Apr-2025	30-Aug-2025
IDA-D0780	Effective	30-Nov-2020	31-Oct-2023	30-Apr-2025	30-Aug-2025
IDA-D3590	Effective	31-Oct-2023	31-Oct-2023	30-Apr-2025	30-Aug-2025
TF-A1232	Closed	30-Jun-2020	30-Jun-2020	30-Jun-2020	30-Oct-2020

Expected Disbursements (in US\$)

Fiscal Year	Annual	Cumulative
2015	0.00	0.00
2016	0.00	0.00
2017	0.00	0.00
2018	0.00	0.00
2019	0.00	0.00
2020	0.00	0.00
2021	0.00	0.00
2022	0.00	0.00
2023	1,000,000.00	1,000,000.00
2024	2,000,000.00	3,000,000.00
2025	2,000,000.00	5,000,000.00
2026	0.00	5,000,000.00



SYSTEMATIC OPERATIONS RISK-RATING TOOL (SORT)

Risk Category	Latest ISR Rating	Current Rating
Political and Governance	● Moderate	● Moderate
Macroeconomic	● Moderate	● Moderate
Sector Strategies and Policies	● Moderate	● Moderate
Technical Design of Project or Program	● Moderate	● Moderate
Institutional Capacity for Implementation and Sustainability	● Substantial	● Substantial
Fiduciary	● Moderate	● Moderate
Environment and Social	● Moderate	● Moderate
Stakeholders	● Moderate	● Moderate
Other	● Substantial	● Substantial
Overall	● Moderate	● Moderate

LEGAL COVENANTS – Additional Financing to the Pacific Resilience Project in Tonga (P178848)

Sections and Description

No information available

Conditions



VIII. RESULTS FRAMEWORK AND MONITORING

Results Framework

COUNTRY: Tonga

Additional Financing to the Pacific Resilience Project in Tonga

Project Development Objective(s)

The objective of the Project is to strengthen early warning, resilient investments and financial protection of Tonga.

Project Development Objective Indicators by Objectives/ Outcomes

Indicator Name	PBC	Baseline	Intermediate Targets									End Target	
			1	2	3	4	5	6	7	8	9		
Strengthen early warning													
Direct Beneficiaries of enhanced Multi-Hazard Early Warning System (Number)		24,000.00	24,000.00	24,000.00	24,000.00	24,000.00	24,000.00	24,000.00	24,000.00	24,000.00	30,000.00	60,000.00	73,500.00
Action: This indicator has been Revised	Rationale: <i>This indicator was always intended to measure the direct beneficiaries of component 1 (as per the description provided on page 22 of the Original Project PAD). This change in the indicator name makes this more explicit. The intent is that coverage will be provided to 70% of the country (as per the redundant and to be dropped second PDO indicator for Component 1), therefore beneficiary targets have been amended to reflect 70% of the total population (currently 105,000 people)</i>												
Female beneficiaries of enhanced Multi-Hazard Early		9,600.00	9,600.00	9,600.00	9,600.00	9,600.00	9,600.00	9,600.00	9,600.00	12,000.00	24,000.00	24,000.00	29,400.00



Indicator Name	PBC	Baseline	Intermediate Targets									End Target
			1	2	3	4	5	6	7	8	9	
Warning System (Number)												
Action: This indicator has been Revised	Rationale: This indicator was always intended to measure the direct beneficiaries of component 1 (as per the description provided on page 22 of the Original Project PAD). This change in the indicator name makes this more explicitly.											
Increased coverage of hazard forecast and warning messages to population at risk (Percentage)		30.00	30.00	30.00	30.00	40.00	50.00	60.00	70.00	70.00	70.00	70.00
Action: This indicator has been Marked for Deletion	Rationale: Indicator dropped as it is considered a duplication of the project beneficiaries indicator, as per the indicator description provided on page 22 of the original PAD.											
Strengthen resilient investments												
School children to benefit from increased resilience to their school (Number)		0.00										9,000.00
Strengthen financial protection of Tonga												
Government of Tonga recieved payment within a month of the occurrence of a covered (insurance) event. (Percentage)		0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00



Indicator Name	PBC	Baseline	Intermediate Targets									End Target	
			1	2	3	4	5	6	7	8	9		
Action: This indicator has been Revised			<p>Rationale: <i>The original wording used standard language for this indicator across all projects in the broader Pacific Resilience Program. However, the government has requested a change in the indicator wording to make it specific to Tonga, therefore indicator has been amendment from "Participating PICs have received payment within a month of the occurrence of a covered insurance events" to "Government of Tonga received payment within a month of the occurrence of a covered insurance event". No other changes have been made.</i></p>										
Time taken to trigger the contingency emergency response component (CERC) for an eligible emergency (Weeks)		0.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Action: This indicator has been Revised			<p>Rationale: <i>Change to the end target from 4 to 6 weeks as it is unknown whether the CERC will be triggered again. End target date revised to extended closing date.</i></p>										

Intermediate Results Indicators by Components

Indicator Name	PBC	Baseline	Intermediate Targets									End Target	
			1	2	3	4	5	6	7	8	9		
Component 1: Strengthening Early Warning and Preparedness													
Improved status of hazards observational network (Hydro, Meteorological and Seismic)		20.00	20.00	20.00	20.00	20.00	30.00	40.00	50.00	50.00	50.00	50.00	50.00



Indicator Name	PBC	Baseline	Intermediate Targets									End Target	
			1	2	3	4	5	6	7	8	9		
(Percentage)													
Action: This indicator has been Marked for Deletion													
Multi Hazard Early warning systems are established and operating (Yes/No)	No	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	
Action: This indicator has been Marked for Deletion													
Number of TMD/NEMO/NRD staff trained to support the MHEWS (Number)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	10.00	12.00	24.00	35.00	
Action: This indicator is New	Rationale: Supports clearer indicator for sub-component 1.1.1, in particular related to capacity building and implemetation support for early warning and preparedness.												
MHEWS Policy developed and adopted (Yes/No)	No	No	No	No	No	No	No	No	No	No	Yes	Yes	
Action: This indicator is New	Rationale: Supports clearer indicator for sub-component 1.1.1, particularly with regards to institutional and regulatory strengthening.												
Number of Early Warning dissemination systems developed and operational	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	2.00	3.00	



Indicator Name	PBC	Baseline	Intermediate Targets									End Target	
			1	2	3	4	5	6	7	8	9		
(Number)													
Action: This indicator is New	Rationale: Supports clearer indicators for warning dissemination systems developed under sub-component 1.1.2												
Number of climate and disaster resilient operations centres are established to support warning and emergency operations on Tongatapu and Outer Islands (Number)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00	2.00	3.00	
Action: This indicator is New	Rationale: Supports clearer indicator for sub-component 1.1.2, particularly with regards to construction and refurbishment of facilities.												
Number of seismic and volcano observation stations established to support MHEWS (Number)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.00	8.00	
Action: This indicator is New	Rationale: Supports clearer indicator for sub-component 1.1.2, specifically with regards to upgrading of the observation infrastructure												
Number of Impact-based forecasting and warning	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	2.00	3.00	



Indicator Name	PBC	Baseline	Intermediate Targets									End Target	
			1	2	3	4	5	6	7	8	9		
systems products established and delivered to users (Number)													
Action: This indicator is New	Rationale: Supports clearer indicator for sub-component 1.1.3, particularly with regards to delivery of piloting of impact forecasts techniques and warnings.												
Number of people who have received IBFWs Products and Services Awareness programs (Number)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4,000.00	5,000.00	
Action: This indicator is New	Rationale: Supports clearer indicator for sub-component 1.1.3, particularly with regards to the number of beneficiaries of impact based forecasts and warnings.												
Number of participants in annual emergency drills (Number)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3,000.00	6,500.00	10,000.00	
Action: This indicator is New	Rationale: Supports clearer indicator for sub-component 1.1.3												
Component 2: Risk Reduction and Resilient Investments													
Number of school buildings rebuilt to improved resilience standards (Number)	0.00	0.00	0.00	0.00	0.00	5.00	10.00	30.00	50.00	50.00	50.00	50.00	
Action: This indicator has been	Rationale: Change end target to 50 to reflect the planned delivery of 33 new school buildings and 21 new WASH facilities constructed under the project												



Indicator Name	PBC	Baseline	Intermediate Targets									End Target
			1	2	3	4	5	6	7	8	9	
<i>Revised</i>												
Number of school buildings repaired or retrofitted to improved resilience standards (Number)	0.00	0.00	0.00	0.00	0.00	0.00	5.00	10.00	10.00	10.00	10.00	10.00
Action: This indicator has been Revised	Rationale: <i>Change end target from 20 to 10 to reflect the pivot towards new buildings (as reflected in the increased target for the indicator related to new buildings) rather than repairs to existing buildings.</i>											
Schools with gender appropriate resilient WASH facilities (Percentage)	0.00	0.00	0.00	0.00	0.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00
Principals and/or head teachers of project schools that feel project investments reflect their needs (of which 50% are female) (Percentage)	0.00	0.00	0.00	0.00	0.00	0.00	80.00	80.00	80.00	80.00	80.00	80.00
Action: This indicator has been Revised	Rationale: <i>Change indicator name for the purpose of providing more clarity. The revised wording modifies the indicator so that “Beneficiaries” is replaced with “Principals and Teachers” to clarify who will be surveyed. Child beneficiaries are reflected in the PDO indicator. Teacher and principals assessment as to whether the investments meet their needs are reflected in the revised wording of this indicator.</i>											
Component 3: Disaster Risk Financing												



Indicator Name	PBC	Baseline	Intermediate Targets									End Target
			1	2	3	4	5	6	7	8	9	
The premiums are lower than the simulated price for a comparable coverage purchased individually in the market (Yes/No)	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Action: This indicator has been Revised	Rationale: Revised to reflect updated responsibility for data collection											
Component 4: Project Management (Action: This Component is New)												
Issues and complaints raised in the project's feedback and grievance redress mechanism addressed within 21 calendar days (Percentage)	75.00	75.00	75.00	75.00	75.00	75.00	75.00	75.00	75.00	75.00	75.00	75.00
Action: This indicator is New												

Monitoring & Evaluation Plan: PDO Indicators

Indicator Name	Definition/Description	Frequency	Datasource	Methodology for Data Collection	Responsibility for Data Collection
Direct Beneficiaries of enhanced Multi-Hazard Early Warning System	This indicator refers to the number of people who are	Six monthly	Project reports	Survey, site visits and consultations	MEIDECC/PMU



	able to receive timely and actionable hazard forecast warning messages				
Female beneficiaries of enhanced Multi-Hazard Early Warning System	Project beneficiaries refers to people who are able to receive timely and actionable hazard forecast and warning messages, understand the meaning and know what actions to take.	Annually	Survey		MEIDECC/PMU
Increased coverage of hazard forecast and warning messages to population at risk	The end target - with the virtual meetings, continued knowledge sharing using virtual platforms - remains achievable.	Annually	Survey		PMU
School children to benefit from increased resilience to their school		Annual	Survey/project reporting	The figure of 931 students is based on roll information from MOET in September 2019.	Ministry of Education and Training/PMU
Government of Tonga recieved payment within a month of the occurrence of a covered (insurance) event.	Percentage of policy-triggering disaster events for which payouts have been provided within a month of the occurrence	Annually	Project progress report		MOF/PMU
Time taken to trigger the contingency emergency response component (CERC) for an eligible emergency	The CERC was triggered in March 2018. It was the first CERC to be triggered in the Pacific Region, and the fourth to be triggered	Annual	Project Progress report	Review of CERC request documentation submitted to World Bank by Government	MoF/PMU



	<p>globally. Indication of the government's intention to trigger the CERC came to the Bank within one month of the event. The formal request to trigger the CERC, including the full CERC trigger package was received and approved within six weeks. No further CERCs have been triggered since March 2018. In the event that the CERC is triggered prior to the end of the project, it is envisaged that the End Target of 6 weeks will be achieved.</p>				
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Monitoring & Evaluation Plan: Intermediate Results Indicators					
Indicator Name	Definition/Description	Frequency	Datasource	Methodology for Data Collection	Responsibility for Data Collection
Improved status of hazards observational network (Hydro, Meteorological and Seismic)		Annually	Survey		MEIDECC/PMU
Multi Hazard Early warning systems are established and operating	Existing hazard observing and warning systems are integrated into fully operational multi-hazard	Annually	Survey/project reports		MEIDECC/PMU



	early warning platforms				
Number of TMD/NEMO/NRD staff trained to support the MHEWS	This will measure staff trained on the improved MHEWS delivered under the project from TMD, NRD and NEMO with an expected 20 staff from TMD, 10 from NRD and 5 from NEMO equating to a total end target of 35 staff.	Every 6 months	Six monthly report	Surveys	MEIDECC/PMU
MHEWS Policy developed and adopted	Indicator measures whether or not policy has been prepared and endorsed by Cabinet.	Every 6 months	Six monthly report	Documentation stating that policy has been prepared and adopted by cabinet	PMU
Number of Early Warning dissemination systems developed and operational	This indicator measures the number of early warning dissemination systems delivered under the project, and may include systems such as (for example) ICT, a Forecasting System, Television Studio and Hazard Risk/Impact Database.	Every 6 months	Six monthly reports	Survey, site visit.	PMU/MEIDECC
Number of climate and disaster resilient operations centres are established to support warning and emergency operations on Tongatapu and Outer	This measure defines new emergency operations centres built under this project.	Every 6 months	Six monthly reports	Site visit, design reports, construction sign of reports etc.	MEIDECC/PMU



Islands					
Number of seismic and volcano observation stations established to support MHEWS	The end target includes 6 observation stations for seismic and 2 for volcanic.	Every 6 months	Six monthly report	Site visits, consultant reports for delivery and commissioning of stations.	MEIDECC/PMU
Number of Impact-based forecasting and warning systems products established and delivered to users	This indicator measures the number of impact forecasting techniques that are developed and piloted under the project.	Every 6 months	six-monthly project report	New products developed, and recipients surveyed.	MEIDECC/PMU
Number of people who have received IBFWs Products and Services Awareness programs	This indicator measures the number of people who have been trained on the new products developed.	Every 6 months	Six monthly report	training records, surveys.	MEIDECC/PMU
Number of participants in annual emergency drills	Indicator measures the number of people who participate in emergency drills supported by the Project.	Every 6 months	Six monthly reports	Surveys	MEIDECC/PMU
Number of school buildings rebuilt to improved resilience standards		Annually	Survey/project reports		MoET/PMU
Number of school buildings repaired or retrofitted to improved resilience standards		Annually	Survey/project reports		MoET/PMU
Schools with gender appropriate resilient WASH facilities		Annually	Survey/project reports		MoET/PMU
Principals and/or head teachers of project schools that feel project investments		Annually	six-monthly report	surveys of teachers and principles	MEIDECC/MoET/PMU



reflect their needs (of which 50% are female)					
The premiums are lower than the simulated price for a comparable coverage purchased individually in the market	Percentage of savings, defined as the simulated individual market (obtained through the World Bank), vs the real price under the PREP	Annually	Project reporting		MOF/PMU
Issues and complaints raised in the project's feedback and grievance redress mechanism addressed within 21 calendar days	This indicator measures the percentage of issues and complaints raised through the project's feedback and grievance redress mechanism that are addressed by the project unit within three weeks	Six monthly	Review of GRM	PMU Safeguards and M&E to review GRM complaints received and track timelines for PMU response	PMU/MEIDECC

