Funding Proposal

Version 1.1

The Green Climate Fund (GCF) is seeking high-quality funding proposals.

Accredited entities are expected to develop their funding proposals, in close consultation with the relevant national designated authority, with due consideration of the GCF's Investment Framework and Results Management Framework. The funding proposals should demonstrate how the proposed projects or programmes will perform against the investment criteria and achieve part or all of the strategic impact results.

Project/Programme Title:	Tuvalu Coastal Adaptation Project
Country/Region:	Tuvalu
Accredited Entity:	United Nations Development Programme
Date of Submission:	30/03/2016

Contents

Note to accredited entities on the use of the funding proposal template
• Sections **A, B, D, E** and **H** of the funding proposal require detailed inputs from the accredited entity. For all other sections, including the Appraisal Summary in section F, accredited entities have discretion in how they wish to present the information. Accredited entities can either directly incorporate information into this proposal, or provide summary information in the proposal with cross-reference to other project documents such as project appraisal document. • The total number of pages for the funding proposal (excluding annexes) is expected not to exceed 50.

Please submit the completed form to:

fundingproposal@gcfund.org

Please use the following name convention for the file name:
"[FP]-[Agency Short Name]-[Date]-[Serial Number]"

A.1. Brief Project / Programme Information			
A.1.1. Project / programme title		**Tuvalu Coastal Adaptation Project (TCAP)**	
A.1.2. Project or programme		Project	
A.1.3. Country (ies) / region		**Tuvalu**	
A.1.4. National designated authority (ies)		**Hon. Enele Sosene Sopoaga, Prime Minister**	
A.1.5. Accredited entity		**United Nations Development Programme**	
A.1.5.a. Access modality		☐ Direct ☒ International	
A.1.6. Executing entity / beneficiary		Executing Entity: United Nations Development Programme Beneficiary: Climate Change Policy Unit, Department of Environment, Public Works Department, Department of Lands and Survey, Department of Rural Development, Ministry of Education Total number of beneficiaries (# of people): approximately 3,100 direct beneficiaries and 3,499 indirect beneficiaries	
A.1.7. Project size category (Total investment, million USD)		☐ Micro (≤10) ☐ Medium (50<x≤250)	☒ Small (10<x≤50) ☐ Large (>250)
A.1.8. Mitigation / adaptation focus		☐ Mitigation ☒ Adaptation ☐ Cross-cutting	
A.1.9. Date of submission Date of re-submission		3 October 2015 2 December 2015 30 March 2016 2 May 2016	
A.1.10. Project contact details	Contact person, position	Yusuke Taishi	
	Organization	United Nations Development Programme	
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	Mailing address	United Nations Service Building, 4th Floor Rajdamnern Nok Avenue, Phranakorn Bangkok 10200 Thailand	

A.1.11. Results areas *(mark all that apply)*

Reduced emissions from:

- ☐ Energy access and power generation
  (E.g. on-grid, micro-grid or off-grid solar, wind, geothermal, etc.)
- ☐ Low emission transport
  (E.g. high-speed rail, rapid bus system, etc.)
- ☐ Buildings, cities and industries and appliances
  (E.g. new and retrofitted energy-efficient buildings, energy-efficient equipment for companies and supply chain management, etc.)
- ☐ Forestry and land use
  (E.g. forest conservation and management, agroforestry, agricultural irrigation, water treatment and management, etc.)

Increased resilience of:

- ☒ Most vulnerable people and communities

(E.g. mitigation of operational risk associated with climate change – diversification of supply sources and supply chain management, relocation of manufacturing facilities and warehouses, etc.)

☐ Health and well-being, and food and water security
(E.g. climate-resilient crops, efficient irrigation systems, etc.)

☒ Infrastructure and built environment
(E.g. sea walls, resilient road networks, etc.)

☐ Ecosystem and ecosystem services
(E.g. ecosystem conservation and management, ecotourism, etc.)

A.2. Project / Programme Executive Summary (max 300 words)

1. The proposed GCF project will enable the Government of Tuvalu (GoT) to implement measures that are urgently required to reduce the impact of increasingly intensive wave action on key infrastructure as a result of climate change induced sea-level rise and intensifying extreme events. Financial and capacity constraints at all levels – from technical to community awareness – that have prevented a sustainable coastal protection solution will be addressed. With GCF financing, it is expected that 35% of high-value vulnerable coasts (2,780m in length) will be made more resilient to withstand the effects of increased wave intensity, compared with the baseline of 7% (570m). The targeted GCF investments will occur at locations that have high concentration of residences. Expected direct benefits are significant with 3,100 people or 29% of the total population in Tuvalu benefiting from the mitigated impact of future wave overtopping events. The project will also strengthen institutional and community capacities for sustaining and replicating project results.

2. Building coastal resilience is an urgent national priority and the formulation of this project has been led at the highest political level and the scope of the project has been fully discussed and devised by a Technical Working Group comprising key Government departments and NGO associations, representing communities.

3. The proposed project leverages domestic financing (USD2.86 million) and is a non-revenue generating public good. Grant funding is therefore requested. The Prime Minister of Tuvalu, who is the NDA to the GCF, has issued a letter of no-objection for the proposed project that is very much country-driven and owned and has had significant input into the proposal.

A.3. Project/Programme Milestone

Expected approval from accredited entity's Board (if applicable)	29 September 2015
Expected financial close (if applicable)	TBD (Date of agreement on the FAA between UNDP and GCF)
Estimated implementation start and end date	Start: 01/10/2016 End: 30/09/2023
Project/programme lifespan	40 years

B.1. Description of Financial Elements of the Project / Programme

4. Grant financing is requested from the GCF to reduce the impact of increasingly intensive wave activity, through the compounding effects of sea-level rise and intensifying storm events, that is amplifying coastal inundation and erosion. It is evident and well accepted that the effects of climate change will only worsen coastal inundation and erosion in Tuvalu. The GCF grant will increase the coverage of coastal protection from the baseline 570m to 2,780m benefiting nearly 29% of the entire population. The GCF investments on coastal protection are directed at coastlines in three islands (Funafuti, Nanumea and Nanumaga) along areas that have a high concentration of houses, schools, hospitals and other social and economic assets (henceforth referred to as "high-value" coastline)[1].

5. Tuvalu is a Least Developed Country with a total population of 10,640. The relatively high per capita income is considered "barely sufficient to cover the high economic cost of business in Tuvalu given its geographic remoteness and relatively limited economic size[2]. National income is heavily dependent on volatile foreign aid, and external indebtedness is high.

6. Tuvalu's livelihood and economic assets were recently devastated by Tropical Cyclone Pam. According to the Tuvalu Tropical Cyclone Pam Report and Recovery and Vulnerability Reduction Plan, the total loss and damages were estimated to be approximately US$10.34 million or 26.9% of the GDP[3]. Moreover, short, medium, and long-term recovery and vulnerability reduction activities across eight sectors[4] are estimated to require a further US$67.64 million. The economic damages and the cost of recovery mean that many years', if not decades', worth of development was undone in the matter of days and impose additional burdens on the sustainable development path for Tuvalu. Tropical cyclones are expected to increase in intensity as climate change becomes more pronounced, and compounded by rising sea levels, the protection of the country's vulnerable coastlines becomes of utmost importance. Two of the three target islands in the GCF project (Nanumea and Nanumaga) are among the four islands hardest hit by Cyclone Pam.

7. Despite the extreme level of vulnerability, Tuvalu currently does not have a single engineered coastal protection infrastructure project that is thought to withstand current and future impacts of sea-level rise and intensifying tropical storms. The only exceptions are two interventions that are currently being designed for a length of 570 m in Funafuti and Nukufetau. The combined factors of high upfront investments required for coastal protection, the public good and non-revenue nature of the required solutions, and the inability of the Government to service loans, have permitted the Government and the community to implement the recognized solutions only at a slow pace and in a highly fragmented manner in the past. Because available resources are generally far smaller than what is required for implementing appropriate response measures, the past initiatives have often resorted to community-scale interventions that hardly withstand the current wave energy, let alone integrating climate change risks into the design. Without GCF support, this sub-optimal practice is likely to continue for the foreseeable future. It is within this context that GCF grant (i.e. 100% concessionality) is requested for the proposed project so that, in conjunction with domestic co-financing, Tuvalu can, finally, take comprehensive and systemic steps to manage coastal inundation risks.

8. The GoT has committed US$2.86 million to co-finance the proposed measures of the project. It comprises the Infrastructure Maintenance Budget (US$2.3 million) as well as in-kind co-financing (US$0.56 million). The Infrastructure Maintenance Budget will be used to finance the necessary monitoring and operation and maintenance (O&M) of the coastal protection infrastructure constructed in the project. This will be used both during, if needed, and beyond the project implementation. In-kind support will come from the time dedicated by the central government officers and outer island-level administrators on project management and monitoring. It will also support the office rent for the project management unit.

9. A breakdown of cost estimates by sub-component in local and foreign currency is provided below[5]:

1 In this proposal, "high-value" areas are consistent with those identified in the Tuvalu Coastal Protection Definition (the World Bank, 2015).
2 UNCTAD (2012). Vulnerability Profile of Tuvalu
3 US$38.32 million in 2013 (current US$). Source: World Bank.
4 Includes investments in environment, infrastructure, health, agriculture, telecom, debris management, disaster risk management, and education.
5 While not included in this proposal as per the instructions of the GCF Secretariat, an additional cost of 9% of the value of the project will be necessary to cover quality assurance and oversight services performed by UNDP as a GCF Accredited Entity over all phases of the project cycle. This includes as follows: (i) oversight of proposal development; (ii) appraisal (pre and final) and oversight of project start-up; (iii) supervision and oversight of project implementation; and (iv) oversee project closure. UNDP awaits confirmation from the GCF Board on this matter and expect that the AE fee, over and above the project cost, will be approved by the GCF Board prior to commencement of implementation activities.

Component	Output	Activity	Financing (MUS$)		Total Cost per output	
			GCF	GoT	Foreign Currency (US$)	Local Currency (AU$)[6]
Component 1 Increased resilience of Tuvaluan coast	Strengthening of institutions, human resources, awareness and knowledge for resilient coastal management	1.1 Technical capacity, knowledge and awareness strengthened for monitoring, protection and maintenance of coastal protection infrastructure	0.973	0.102	3,137,440	4,480,266
		1.2 Long-term national human resource capacity and awareness enhanced for sustainable coastal protection	1.960	0.102		
	Vulnerability of key coastal infrastructure including homes, schools, hospitals and other assets is reduced against wave induced damages in Funafuti, Nanumea and Nanumaga	2.1 Coastal protection design, site-specific assessments and ESIA undertaken in all islands in a participatory manner	2.609	0.256	30,364,128	43,359,975
		2.2 Coastal protection measures implemented	25.200	2.300		
	A sustainable financing mechanism established for long-term adaptation efforts	3.1 All Islands Strategic Plans and annual budgets integrate island-specific climate risks through gender sensitive, participatory processes	5.056	0.080	5,368,432	7,666,121
		3.2 Capacity of Kaupules, Falekaupules and community members strengthened for monitoring coastal adaptation investments	0.212	0.020		
Total project financing			36.010	2.860	**38,870,000**	**55,506,362**

[6] Exchange rate used is as of 1 October 2015 (UN Operational Rates of Exchange)

10. Similarly, the expenditures by types of activities are presented in a table below.

Activity Type	Amount (US$)	Percentage of Total
Capacity building	2,360,900	6.56%
Travel	990,040	2.75%
Equipment and supplies	190,437	0.53%
Coastal protection	24,930,072	69.23%
Contractual Services	3,500,364	9.72%
ISP mainstreaming and strengthening	929,927	2.58%
Contingencies	248,260	0.69%
Project Management Cost[7]	2,860,000	7.94%
Total	36,010,000	100%

B.2. Project Financing Information

	Financial Instrument	Amount	Currency	Tenor	Pricing
(a) Total project financing	**(a) = (b) + (c)**	38.870	million USD ($)		
(b) GCF financing to recipient	(i) Senior Loans (ii) Subordinated Loans (iii) Equity (iv) Guarantees (v) Reimbursable grants * (vi) Grants *	.... **36.010**	Options Options Options Options Options million USD ($)	( ) years ( ) years	( ) % ( ) % ( ) % IRR
	** Please provide economic and financial justification in section F.1 for the concessionality that GCF is expected to provide, particularly in the case of grants. Please specify difference in tenor and price between GCF financing and that of accredited entities. Please note that the level of concessionality should correspond to the level of the project/programme's expected performance against the investment criteria indicated in section E.*				
	Total requested (i+ii+iii+iv+v+vi)	**36.010**	million USD ($)		

	Financial Instrument	Amount	Currency	Name of Institution	Tenor	Pricing	Seniority
(c) Co-financing to recipient	Grant Options Options Options	2.86	million USD ($) Options Options Options	GoT	( ) years ( ) years	( ) % ( ) % ( ) % IRR	Options Options Options Options
	Lead financing institution: Not Applicable						
	** Please provide a confirmation letter or a letter of commitment in section I issued by the co-financing institution.*						

[7] See Annex V (a) for the breakdown of Project Management Cost

(d) Financial terms between GCF and AE (if applicable)

In cases where the accredited entity (AE) deploys the GCF financing directly to the recipient, (i.e. the GCF financing passes directly from the GCF to the recipient through the AE) or if the AE is the recipient itself, in the proposed financial instrument and terms as described in part (b), this subsection can be skipped.

If there is a financial arrangement between the GCF and the AE, which entails a financial instrument and/or financial terms separate from the ones described in part (b), please fill out the table below to specify the proposed instrument and terms between the GCF and the AE.

Financial instrument	Amount	Currency	Tenor	Pricing
Choose an item.	……	Options	( ) years	( ) %

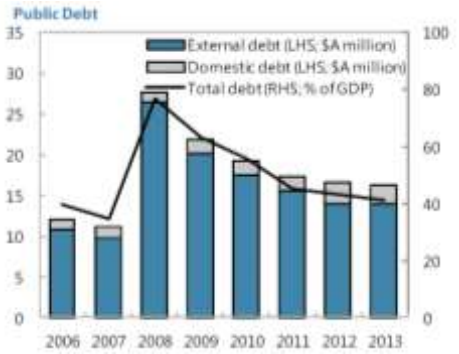
Please provide a justification for the difference in the financial instrument and/or terms between what is provided by the AE to the recipient and what is requested from the GCF to the AE.

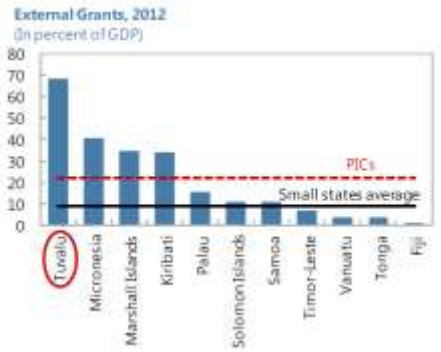
B.3. Financial Markets Overview (if applicable)

11. Not applicable

C.1. Strategic Context

12. Tuvalu is the fourth smallest nation in the world. It comprises nine inhabited islands with a population of 10,640. The total land area is 26 km^2. Funafuti atoll, where the national capital is located, is home to about half of the population. With the average elevation of 1.83m, Tuvalu is one of the most vulnerable countries in the world to the impacts of climate change, particularly to projected sea-level rise and increases in the severity of cyclones. When combined with considerable development challenges, a narrow resource base economy and chronic capacity constraints, the high levels of vulnerability to climate change impacts are likely to have severe long term effects on sustainable development of the country.





13. Distance from international markets, remoteness of nine inhabited islands of the country, the size of the country and economy, which are extremely vulnerable to external shocks, and a limited natural resource base are factors that make economic development extremely challenging for Tuvalu. The economy of Tuvalu and the government revenues rely significantly on foreign aid, fishing license fees from foreign fishing vessels, and remittances from seafaring, which is thought to provide employment to 15% of the adult male population. There is also reliance on income from the Tuvalu Trust Fund. The economy is fragile as fishing revenues and foreign aid are highly volatile and remittances from seafarers highly dependent on the global economy. IMF reports that Tuvalu's public debt had reached 41% of GDP by the end of 2013, with external debt accounting for 35% of GDP. The debt is expected to have risen to 56.9% in 2014 due to a recent loan agreement on a fishing joint venture. The share of external grants (% of GDP) and public debt are presented below[8]. The right panel indicates the degree to which Tuvalu is, even among other SIDS in the region, highly dependent on foreign aid.

14. Considering the small size and fragility of its economy, in addition to its physical and environmental vulnerability, Tuvalu is expected to be affected severely by the impact of climate change. The Pacific Climate Change Science Programme (PCCSP) study recently concluded that tropical cyclones are expected to decrease in number by the late 21st century but increase in the proportion of more intense storms. These predictions are likely to have significant implications on future damages in terms of human lives, infrastructure and livelihood assets as research indicates that, globally, 10% of intense tropical cyclones are presently responsible for 93% of damages[9]. The study also points out that the sea level near Tuvalu has risen by about 5 mm per year since 1999 (a total of 9 cm over this period). Under a high emissions scenario, a 4-14 cm rise is expected before 2030 and 19-58 cm before 2090. The combination of two manifestations of climate change – continually intensifying cyclone events and sea level rise – will have dire impacts on Tuvalu. Wave overtopping events during king tides and cyclones cause damages to natural assets such as Tuvalu's fragile groundwater lens and many other economic/social/cultural assets.

15. Impacts of climate change are already felt in Tuvalu, most recently during Tropical Cyclone Pam in March 2015 which caused widespread damage by large waves and storm surges. Damage included seawater flooding and destruction of agriculture and infrastructure, contamination of water supplies, coastal erosion and scouring. It is estimated that 45% of the total population was internally displaced and the total economic loss and damages were Aus$13.95 million (US$10.34 million[10]). Bringing lives and livelihoods back on track will take years and the recovery efforts will put further strain on the Government that is already suffering from limited human capacity and financial resources. In addition to Cyclone Pam, a storm surge in 2010 affected 467 households or nearly 30% of the total households in the country[11]. King tides are another type of extreme events affecting the country. A study analyzed 28 king tide events that have caused flooding between 1994 and 2012, five of which have occurred since 2010. All of these events are thought to have flooded half of the island

[8] IMF Country Report No.14/253

[9] Mendelsohn, R., Emanuel, K., Chonabayashi, S., Bakkensen, L. (2012). The impact of climate change on global tropical cyclone damage. *Nature Climate Change*. 2, 205–209

10 Government of Tuvalu. (2015) Tuvalu Tropical Cyclone Pam Report: Recovery and Vulnerability Reduction Plan indicates damages and losses from TC Pam to be AU$ 13,954,076. Using the UN Operational Exchange Rate of 1.349 (as of 15 Jul 2015), the loss and damage from TC Pam is estimated at US$ 10,344,014.

[11] Tuvalu National Population Housing Census 2012

of Tuvalu[12] based on the average elevation of the islands of Tuvalu. The same study estimates that warm water contributed to the king tide phenomenon by an average of 5.1% and a maximum of 7.8%. This indicates that the effect of king tides will be greater under a warming climate where warm water will compound with a rising sea level.

16. Tuvaluan coasts, extending nearly 82km[13], are not currently effectively protected by infrastructure against the impact of tropical storms, king tides, other wave-overtopping events and shoreline retreat. These events are already inflicting economic damages – reported or unreported – on economic and social infrastructures. Internal displacement has also taken place in the past, the most recent of which was Cyclone Pam in 2015.

17. Rising sea-levels and intensifying tropical storms, as projected under climate change, are expected to aggravate damages that Tuvalu is all too familiar with. Thus, vulnerability reduction to these events becomes one of the most critical elements of climate change adaptation for Tuvalu. To this end, this project is designed to strengthen coastal protection in three out of the nine inhabited islands of Tuvalu and to pave the way for, ultimately, reducing the vulnerability of all inhabited islands that make up Tuvalu to future impact of climate change.

18. This project is in line with all of the key government strategies and policies. Te Kakeega II 2005-2015 is Tuvalu's national development strategy, which recognizes that climate change poses significant threats to the achievement of the national development goals. Te Kaniva, the Tuvalu Climate Change Policy, with its vision *"To protect Tuvalu's status as a nation and its cultural identity and to build its capacity to ensure a safe, resilient and prosperous future"* guides the country's efforts in both adaptation and mitigation. Goal 4 of the policy specifically focuses on developing and maintaining Tuvalu's infrastructure to withstand climate change impacts and aims to deliver coastal protection following best practices appropriate for Tuvalu's situation. Tuvalu also launched its national gender and youth policy in 2013 and 2015, respectively, which aim to bolster participation of women and youth in decision-making and promote their economic empowerment, among others. The women and youth engagement approach adopted in this project is fully in alignment with this view.

19. It is also worth noting that Tuvalu's historic contributions to the current concentration of carbon dioxide in the atmosphere are negligible; and yet, the country is facing an existential threat because of climate change. It is in this context that Tuvalu is seeking urgent financial assistance from donors through the Green Climate Fund. Accordingly, a key design principle that underlies this project is this commitment of the Government expressed in Te Kaniva – protecting the nation's sovereignty, which goes well beyond the realm of the physical territory of the country, but also includes the sense of self-fulfillment people derive from the ability to make decisions about their own future and the sense of dignity people derive from living in a country or culture to which they belong.

C.2. Project / Programme Objective against Baseline

Baseline Scenario

20. The PCCSP study[14] highlights the following climate change trends and future projections in Tuvalu:

- ***Temperatures have increased*** and ***will continue to increase*** with ***more very hot days*** in the future. Projections show that by 2030, under high emission scenario, temperature may increase in the range of 0.4 – 1.0°C.
- ***Rainfall is generally projected to increase*** over this century with ***more extreme rainfall days*** expected. Wet season and dry season increases of rainfall are expected, mainly due to the projected intensification of the South Pacific Convergence Zone. However, there is some uncertainty in the rainfall projections and not all models show consistent results. Drought projections are inconsistent across Tuvalu. However, the frequency and intensity of extreme rainfall events are projected to increase.
- By the end of this century projections suggest ***decreasing numbers of tropical cyclones*** but a possible ***shift towards more intense categories***. Projections in Tuvalu tend to show a decrease in the frequency of tropical cyclones by the late 21st century and an increase in the proportion of the more intense storms. On a global basis, there is a growing level of consistency between models that the frequency of tropical cyclones is likely to decrease by the end of the 21st century by 6-35%. There is also a general agreement between models that the mean maximum

[12] Lin, C.C., C.R. Ho, & Y.H. Cheng. (2014). Interpreting and analysing king tide in Tuvalu. *Natural Hazards and Earth System Sciences*. 14, 209-217.
[13] This figure does not include the length of coastlines of uninhabited islands.
[14] Pacific Climate Change Science Program. (2014). *Current and future climate of Tuvalu*. http://www.pacificclimatechangescience.org/

wind speed of cyclones will increase by 2-11% and that rainfall rates will increase in the order of 20% within 100km of the cyclone center[15].

- ***Sea level near Tuvalu has risen and will continue to rise*** throughout this century (very high confidence). Since 1993, the sea level has risen by about 5mm per year (or a total of 9cm over this period), which is 28-44% higher than the global average. By 2030, under a high emissions scenario, the rise is projected to be in the range of 7-18 cm and 39-87 cm before 2090. The sea-level rise combined with natural year-to-year changes will increase the impact of storm surges and coastal flooding.
- As atmospheric CO_2 concentrations continue to rise, **ocean will warm and continue to acidify**. In all of the three projections used in the PCCSP study, the aragonite saturation state, a proxy for coral reef growth rate, will continue to decrease as atmospheric CO2 concentrations increase (*very high confidence*). This is consistent with a study carried out by the Secretariat of the Pacific Community (SPC) in which ocean pH is projected to decline (i.e. increase in ocean acidification) by the end of the 21st century in two emission scenarios[16]. As the ocean warms, **the risk of coral bleaching also increases** (*very high confidence*). The projections of increasing ocean acidity and risk of coral bleaching, compounded by other stressors such as storm damage, are expected to further increase Tuvalu's coastal vulnerability as coral reefs provide an important ecosystem function, among others, to attenuate wave energy reaching the foreshore.

21. These observed and projected changes suggest that climate change poses an existential threat to Tuvalu. With the projected sea-level rise, it is possible that significant areas of the country will be submerged. One of the impacts of more intensive tropical cyclones, coupled with the rising sea level, is stronger wave actions against Tuvaluan coasts. The Tuvalu Climate Change Policy argues that maintaining the sovereignty of Tuvalu is a critical policy objective and a nation-wide relocation is not considered an official solution to climate change. Furthermore, with the highly limited land availability, neither is facilitating internal relocation a pragmatic option. This means that vulnerability reduction in all of the inhabited islands in the country is an important adaptation objective for the country. The urgency of the issue also led to the establishment of the Climate Change Advisory Unit under guidance from the National Advisory Council on Climate Change Policy (NACCC).

22. There are several ongoing initiatives that contribute to reducing the vulnerability of the country, particularly focusing on reducing coastal vulnerability. The proposed GCF project will build on and complement the following initiatives:

- The ***"Increasing Resilience of Coastal Areas and Community Settlements to Climate Change"*** (LDCF US$3,060,000; DFAT AU$1,000,000, UNDP) (2009-2016) project is the first project that addresses NAPA priorities and designed to increase the resilience of coastal community in all inhabited islands of Tuvalu. A preliminary coastal assessment has been carried out in the islands of Nukufetau and Nanumea, and it has identified a range of coastal protection options including geo-textile container revetments and ecosystem-based approaches such as coastal vegetation. Building on this report, construction of a geo-textile revetment along 390 m of coastline is expected to start in 2016 using the Tuvalu Climate Change and Survival Fund resources as part of Cyclone Pam recovery work. This preliminary assessment was one of the very few coastal assessments ever undertaken in the country and offers an important basis for possible coastal protection options that are technically feasible especially in the outer island context. The proposed project incorporates feasibility lessons from this technical assessment (See Feasibility Study, Annex II).

- The ***"Effective and responsive island-level governance to secure and diversify climate resilient marine-based coastal livelihoods and enhance climate hazard response capacity"*** (LDCF US$4,325,000, UNDP) (2013-2017) project is the second NAPA follow-up project. It has a component that aims to build the capacity of outer island administrations for integrating climate change priority actions into their Island Strategic Plans and financing them from domestic unconditional grants. This component will be an important basis for establishing a sustainable financing mechanism for climate change adaptation actions (refer to the Project Output 3).

- ***Implementing a 'Ridge to Reef' approach to protect biodiversity and ecosystem functions in Tuvalu (R2R Tuvalu)*** (GEF US$3,762,844, UNDP) (2015-2020) aims "to preserve ecosystem services, sustain livelihoods and improve resilience in Tuvalu" through an approach that encompasses all areas from ridge to reef. This project also

[15] See also Knutson, T. R., McBride, J. L., Chan, J., Emanuel, K., Holland, G., Landsea, C., Held, I., Kossin, J. P., Srivastava, A. K., and Sugi, M. (2010). Tropical cyclones and climate change: *Nature Geoscience*, v.3, no.3, p.157-163.

[16] Bell, J.D., Johnson, J.E., Ganachaud, A.S., Gehrke, P.C., Hobday, A.J., Hoegh-Guldberg, O., Le Borgne, R., Lehodey, P., Lough, J.M., Pickering, T., Pratchett, M.S. and Waycott, M. (2011). *Vulnerability of Tropical Pacific Fisheries and Aquaculture to Climate Change*. Secretariat of the Pacific Community, Noumea, New Caledonia

has a component, complementary to the second NAPA project, which improve evidence-based planning, decision making, and natural resource management at the outer island level, which will be an important baseline for the Project Output 3.

- The ***Project for pilot gravel beach nourishment against coastal disaster on Fongafale Island*** (JICA, approximately JPY 195 million) (2012-2017) builds on the findings from the "Study for Assessment of Ecosystem, Costal Erosion and Protection/Rehabilitation of Damaged Area in Tuvalu" conducted in 2009-2011. In this study, beach nourishment was found as a potentially appropriate coastal protection option and the project intends to pilot test its effectiveness. It is expected that the investment will cover 180m of a stretch in Funafuti and the construction has recently commenced and that the effectiveness in terms of wave energy dissipation and erosion control will be presented by 2017. This project will offer an important option for the GCF project to replicate once proven effective. The proposed project incorporates feasibility lessons from this technical assessment (See Annex II).

- ***Tuvalu coastal protection scope definition: Cyclone Pam recovery*** (World Bank, 2015) has been conducted in response to Tropical Cyclone Pam. This exercise resulted in the identification of vulnerable coastlines and possible options for coastal protection. Based on this preliminary assessment, the World Bank is currently in discussion to provide up to US$5 million grant financing on coastal protection initiatives in Tuvalu. The proposed project incorporates feasibility lessons from this technical assessment (See Annex II).

23. In addition to these donor-financed initiatives that present a basis on which the proposed GCF project is built, the GoT has produced a *Tuvalu Tropical Cyclone Pam Report and Recovery and Vulnerability Reduction Plan*. It is a disaster recovery and vulnerability reduction plan with key priorities for community resilience building, risk reduction and preparation for future disasters with identified financial gaps of US$60.6 million, although sources of financing are yet to be identified. One of the three priority areas is to "support the construction and repair of damaged infrastructure (coastal protection, sea walls, permanent shelters and community infrastructures). The proposed GCF project will deliver on the disaster recovery and vulnerability reduction efforts under the Tuvalu TC Pam Recovery and Reduction Plan. The GoT is also currently using its own resources to conduct short-term, temporary coastal works in preparation for this cyclone season.

Existing and future coastal protection work and GCF contribution

24. The total length of coast in the nine inhabited islands[17] is 81,900m. Of this, according to the WB preliminary coastal assessment, 21,300m is considered vulnerable coastlines that require foreshore protection. Of this length of vulnerable coastlines, 7,930m is considered "high-value" vulnerable coastlines based on the concentration of houses and other social and economic assets.

25. In contrast, the existing coastal protection structures are extremely sparse and limited. In Funafuti, there are two stretches of coastlines, totaling about 70m in length that have a vertical concrete seawall. One is in front of a hotel (about 50m in length) constructed with support from a bilateral donor and the other is structurally part of a wharf (about 20m). The former is thought to be reaching its product life and unlikely to withstand strong wave or wind energies[18]. The level of structural durability of the latter requires a more detailed assessment. The JICA study concludes that almost all other coastal protection in Funafuti and outer islands is ad-hoc and poorly designed, unable to withstand wave energies, with the result being a severely degraded shoreline in terms of both the physical and ecological characteristics and functions (Annex II presents some photographs of these structures). These measures have been financed by both donor grants (such as gabion baskets and concrete blocks built several decades ago) and private/communal funds (such as simple materials/bulkheads to armour the foreshore). Table below shows existing coastal protection measures in the country.

Location	Measure
Funafuti	Drum filled with concrete – has been damaged, protection business
Laloniu	Concrete cement protected private residence
Falesa	Concrete cement protecting private residence – partly damaged
Siliga	Concrete wall – protect residence
Poulasi	Concrete wall – protect residence

[17] In the Funafuti atoll, there is a small community living in an island north of the main island of Fogafale. However, to avoid confusions and follow the local convention, Funafuti is considered one island throughout this proposal, but the length of coastline for Funafuti includes these two islands. Assessment was carried out by Alan Resture in 2013 (unpublished).
[18] Personal communications with a JICA-contracted coastal engineer working on the beach nourishment project.

Tafue	Concrete wall – protect residence
Takutaku	Rock wall and groyne – protect land and agriculture
Nukulaelae island	Traditional protection measures – made of coconut and pandanus tree trunks
Nukufetau Kaupule	Rock wall – protect land
	1978 – Gabion Baskets all islands
	1985 – Block seawall - Nanumauga, Nukulaelae, Nukufetau, Funafuti, Nanumea

26. The following table summarizes the existing coastal conditions in the country.

Island name	Length of coastlines (m)***	Land area (km^2)	Population (2012)	Wave/wind direction	Vulnerable coastlines (m)****	High-value coastlines***	Existing or known future coastal protection (m)
Nanumea*	**18,560**	**1.19**	**612**	**SW-NE**	**1,900**	**760**	
Niutao	6,200	2.35	694	West-East	1,300	580	
Nanumaga*	**7,060**	**3.01**	**551**	**West-East**	**780**	**450**	
Nui (Fenuatapu)	8,690	1.38	729	Westerly	1,420	750	
Vaitupu	12,660	5.24	1,542	SW-NE	1,800	850	
Nukufetau (Savave)	2,530	0.21	666	SW-NE	1,100	390	390 (GoT)
Funafuti (Amatuku)	1,520	0.006	5,436	West	0	0	
Funafuti (Fogafale)*	**18,930**	**1.42**		**West**	**9,000**	**3,600**	**180 (JICA)**
Nukulaelae (Fagaua)	3,150	0.23	364	West	1,600	550	
Niulakita*	2,600	0.42	46	West	0	0	
Total	**81,900**	**15.46**	**10,640**		**18,900**	**7,930**	

* Islands where GCF investments are proposed
** Niulakita, unlike the other islands, has an average elevation of over 4m which is high by the standards of Tuvalu. For this reason, zero is recorded as the length of vulnerable coastlines is recorded.
*** Inhabited islands only
**** Based on the WB preliminary assessment report

27. Currently there are ongoing projects that focus on coastal protection (a government-financed project focusing on 390m of high-value coast in Nukufetau building on the initial work of UNDP/LDCF; JICA support focusing on 180m of high-value coast in Funafuti). Once the constructions complete, they are expected to provide valuable empirical information about how the structures interact with the local coastal/environmental conditions and how the local community interacts with them.

Key Barriers addressed by the project

28. Despite Tuvalu's aspiration to reduce its vulnerability to climate change and ongoing international support in this regard, there are several barriers that need to be removed in order to bring about transformational impact that is both effective and sustainable.

29. ***Limited national financial resources and dependency on fragmented external financing:*** Coastal protection and site-specific assessment to finalize the design of the protection is expensive. Tuvalu's narrow economic base makes it extremely difficult for national budgets to be invested in for this purpose. As a result, past coastal protection investments have been financed through the small discretionary budgets available for outer island administration, private financing, or donor funding. All of these sources are often too small and fragmented to provide a comprehensive, lasting solution. Lack of finance often leads to a design that is not based on detailed site-specific hydrodynamic modelling that enable the final structure to be perfectly aligned with the coastal processes (for improved performance and longevity of the structure) and enable future climate conditions to be incorporated into the design. "Best Practices from the Pacific" (USP, 2015) highlights that poor seawall designs in the Pacific have in the past resulted in maladaptation. Both the WB and JICA assessment reports revealed that many (if not most) privately or communally financed attempts in Tuvalu to armour the foreshore have failed or are failing due to insufficient or complete lack of site-specific assessments. Similarly, an LDCF assessment report points out that concrete blocks that were supplied by a development partner 25 years ago were not robust enough to withstand the immediate wave energy forces[19]. Without GCF investments, it is likely that the GoT will continue to rely on unpredictable donor financing and/or small community-level financing to build ad hoc structures (e.g.

[19] At the time of production of the report, it pointed out the risk of collapse in the next high-wind/wave event, and in fact, it was destroyed during Cyclone Pam in March 2015.

gabion baskets, concrete blocks, stone pitch seawall) that repeatedly fail to withstand the increasing intensity of tropical cyclones and sea-level rise (More details are found in Annex II).

30. ***Ineffective use of small, but available domestic (outer island level) financing for coastal protection:*** There are several sources of discretionary grants that are available for outer island administrations. While there is a growing recognition among the island administrations and local populations that the local development plan, called the Island Strategic Plan (ISP), should govern the use of such grants, the current ISPs still have the characteristics of a development wish list and are not constrained by the available financing or skillsets to execute priority actions. Ecosystem-based approaches, for example, would be potentially an effective option for coastal protection that utilizes locally available materials and skillsets, but outer island communities are currently constrained by limited knowledge about such an approach and weak planning capacity.

31. ***High staff turnover and a limited number of qualified professionals:*** Although 69% of the workforce in Tuvalu work for the public or semi-public sectors[20], the small total population size makes the core group of climate change professionals to a handful of staff and the impact of staff turnover is significant once a qualified professional leaves the country. For Tuvalu to attain sufficient capacity to tackle the consequences of climate change in an effective and sustainable manner, technical skillsets needed for effective coastal monitoring, protection and O&M need to be developed within relevant Ministries and Departments. At the same time, the Climate Change Policy Unit, a newly established entity whose mandate is to provide inter-ministerial coordination support and lead climate change policy formulation, requires capacity building support to effectively fulfill their mandate.

32. ***Exclusive focus on short-term capacity building:*** Despite the high level of coastal vulnerability, Tuvalu does not have a support system for building long-term national capacity for coastal management professionals. External development projects almost always focus on building short-term capacities by focusing solely on *existing* government officials; little attention is paid to building the long-term technical/professional capacity by targeting those currently outside of the government system such as youth, some of whom are expected to move into the Government system in the near future. Regional mobility is high among skilled professionals in the Pacific, and in the absence of conscious investments in long-term capacity building of the nation, the departure of one technical officer from the government could leave a significant gap in responding to urgent issues in the country. To ensure that Tuvalu maintains a consistent level of technical capacity for coastal protection, it is imperative that the conventional capacity building strategy is altered: A support system needs to be established to build the long-term capacity in the specific areas that the country considers their national development priority, such as coastal protection.

33. The proposed GCF project will address these barriers that prevent Tuvalu from reducing its vulnerability to climate change in an urgent, effective and sustainable manner. These barriers will be addressed through a coherent project framework which comprises three “sub-components” (which refer to the Outputs as per the GCF logic framework). First, the project will tackle the issue of institutional and human capacities constraints in Tuvalu for effective coastal protection. This will be achieved through capacity building support to current government officers and community members. It is expected that, by the end of the project, the country will possess the necessary skills within both communities and the Government: within communities, the focus is on building capacity to collect key data on coastal dynamics through simple beach profile surveys; and within the Government, it is expected the capacity of technical departments will be built to coordinate multiple stakeholders for effective adaptation actions, synthesize and analyze climate, but particularly coastal, data. Capacity building at these two levels will be a building block for expanding effective coastal protection interventions beyond the GCF project lifecycle. At the same time, Tuvaluan youth will be specifically targeted for capacity development as a potential cadre of future professionals in the climate change field, particularly related to coastal protection. Local community members will be trained on skill building for O&M of the coastal protection investments. Second, the project will undertake an island-level hydrodynamic modelling to finalize the design of the coastal intervention in the three targeted islands. Third, in order to maintain and sustain coastal protection investments, the project will support the ongoing efforts of mainstreaming climate change adaptation into the ISP process. The project will strengthen Island level planning and budgeting process so that resilience-building initiatives identified in the ISPs can be financed by either domestic or external resources and executed. In so doing, women’s group will be engaged as an agent to improve the balance of power in the context of island-level decision making process.

34. By implementing the project, 2,210m of coastal defense measures will be constructed to alleviate damages to key infrastructure from wave overtopping events in the islands of Funafuti, Nanumea and Nanumaga. This means that GCF investments will increase the length of coverage of coastal protection to 35% of the high-value coastlines compared

[20] ILO. (2010). Decent Work Country Programme: Tuvalu

against the baseline of 7%. It is expected that the project will have direct benefit to 3,100 people in the country (1531 men and 1569 women), nearly 29% of the total population. Future damages expected from wave overtopping events, amplified by the rising sea-levels and intensifying cyclones, will be alleviated. This in turn will contribute to the overall vulnerability reduction of the country in the long-run.

C.3. Project / Programme Description

35. The **Project Objective** is to reduce the vulnerability of three islands of Tuvalu to coastal inundation and erosion. This Objective is attained through the achievement of three Outputs (each of which corresponds to sub-component). The Outputs and project activities are detailed below:

Output 1: Strengthening of institutions, human resources, awareness and knowledge for resilient coastal management

36. US$2.7 million or 8% of the total project resources will be used to strengthen the national capacity and overall national conditions for long-term viability and sustainability of the coastal interventions. As described earlier, institutional and human resource weaknesses underlie many of Tuvalu's development challenges, and climate change impact will interact with these weaknesses and further aggravate the vulnerability of the country. The needs for coastal protection have been poorly addressed to date because, in addition to financial constraints which will be addressed under Output 2, the interrelated barriers of technical capacity, awareness and knowledge, have not been sufficiently addressed at all levels of the country from decision makers to community members. The project resources will be used to address this multi-layered capacity barrier in a coherent and comprehensive manner, thus avoiding a fragmented approach to barrier removal, which historically has resulted in a piecemeal set of solutions that fell short of realizing a paradigm shift. This Output comprises three key activities.

1.1. Technical capacity, knowledge and awareness strengthened for monitoring, protection and maintenance of coastal protection infrastructure

37. The jurisdiction of coastal protection is shared across the Department of Lands and Survey (DoLS), Public Works Department (PWD) and Department of Environment (DoE). However, none of these departments currently have the technical capacity to monitor the dynamic processes of coastal change over time nor the capacity to design potential coastal interventions. Nor is there sufficient capacity within the Climate Change Policy Unit (CCPU) to coordinate the work of these departments for effective coastal protection. Due to this limitation, the Government is not able to carry out vulnerability assessments, site assessments and coastal design, make informed decisions about pragmatic solutions for coastal protection, and identify potential funding sources for implementation. Instead, they generally have to wait for a donor, often with particular areas of financing priority, to approach them. This lack of ability to carry out a preliminary technical assessment contributes to an increasing sense that the issue is out of their control and eventually to limited ownership. Further, although the CCPU was newly established in 2015 to coordinate government's actions for climate change adaptation and mitigation, medium- to long-term capacity building efforts are needed in the technical areas of climate change, coordination, project design and management, financial management, knowledge management and reporting.

38. Development of technical capacities for coastal vulnerability assessments and technical assessments will require that technical officers in the three departments play mutually-reinforcing, and yet distinct, roles. In particular, the role of DoLS technical staff is monitoring and assessment; PWD is responsible for preliminary design of interventions; and DoE is responsible for overseeing the environmental and social impact assessment (ESIA) process while the CCPU plays a coordinating role. The GoT will use the project resources to train staff members from each of these departments through hands-on trainings offered by international-level experts, including regional institutions like SPC (Secretariat of the Pacific Community) Geoscience Division and SPREP (the Secretariat of the Pacific Regional Environment Programme). The same staff members will also join site-specific assessments (conducted by an international contractor) and implementation of coastal protection measures (under Output 2) so that they are exposed to new techniques and knowledge. It is important to note that the training on coastal protection design will cover both hard-engineering and ecosystem-based adaptation (EBA) approaches such as coastal vegetation, ridge and dune restoration, coral transplantation or seagrass plantation. This is to maximize the replication potential of GCF investments beyond the project to the remaining high-value vulnerable coastlines in the country.

39. The existing government staff from whom the target of 12 individuals, of which 5 are women, will be selected for technical training include the following:

- 4 DoLS staff (Survey Technician; 2 Survey Assistants; Surveyor) on synthesizing and processing profile data and GIS
- 4 PWD staff (Civil engineer; 4 designers) on coastal design, EBA coastal design, operation of heavy machineries for construction and maintenance
- 1 DoE staff (EIA officer) on EIA specifically on coastal infrastructure construction
- 4 CCU staff (Project Development Officer; Data & Information Officer; Policy Coordinator; and one technical position which is currently in the approval process) on project development and management focusing on climate change and disaster risk management; V&A assessment; progress performance measurement tools; data and knowledge management; CBA.

40. At the outer island level, similar but tailored set of trainings will be provided for real-time monitoring of the coastal environment and maintenance of the implemented coastal protection measures. This will involve training in the collection of beach profile data, monitoring sediment and beach changes as well as the possible maintenance and monitoring of geo-textile containers. The parameters to be collected in beach profiling include the extent of sediment movement (erosion and deposition), overall sedimentation budget and the level of inundation during king tides and other wave overtopping events, both in and outside the locations receiving GCF interventions. For this work, a land clerk, a position that exists in each of all the islands, will be trained. Currently four out of nine land clerks are women. In addition, local youth and women will be trained so that in each island at least five individuals (one existing land clerk and four new recruits) are trained for this purpose. The data collected will be transferred to DoLS for synthesis and simple analysis and then to SPC which has a regional repository of data from member countries including Tuvalu. The reposition of data at SPC is to ensure continuity in data and to avoid unnecessary investment in a data management system at the country level.

41. Beach profiling is a simple, low cost and effective tool for monitoring long term changes in beach and coastal morphology as well as for monitoring and quantifying the long-term effects of the adaptation measures. In beach profiling, simple transects of the topography across the beach are measured using standard survey equipment. Profiles are measured along parallel lines spaced 50 to 100m apart with profiles starting 100 to 200 m inland and continuing out in to the water to a safe wading depth. Profiles will be measured monthly and after any significant wave events for the first year and bi-monthly or quarterly (as well as after significant storm events) in subsequent years. Profiling will start immediately after the GCF project begins to establish a firm set of pre-intervention baseline data. Following implementation of the adaptation measures, profiling will continue at monthly intervals for one year and quarterly thereafter.

42. The data collected from beach profiles will show seasonal changes in the beach shape as it responds to changes in the wave climate. The act of collecting profiles, plotting and reducing the data to a useable form, conducting preliminary analyses and transferring it to the government agency is a valuable opportunity for raising awareness.

43. Since Tuvalu currently does not have any engineered coastal protection infrastructure, the technical capacity for basic maintenance does not exist. While the interventions proposed in this project (Output 2) have been chosen because they should not require major overhauls for 25-50 years, the need for minor maintenance can be expected. This could be in the form of repair of geo-textile revetment that are proposed in the outer islands or repairing of auxiliary facilities such as wave return walls or a wooden walkway built over the structure. This could also be in the form of monitoring and maintenance of predefined coastal access ways designed to reduce dune ridge degradation from pedestrian traffic. Thus, skill building related to these measures will be provided to both staff in PWD and community members. Engagement of local youth and women provides a valuable source of employment and income for local communities. Their engagement is guided by a specific strategy as shown in Section E.5.3 and Annex XIII.

44. The following indicative inputs will be financed and implemented for Activity 1.1.

- Training of beach profiling workers in outer islands on the use of survey equipment; agreement of contracts including the frequency of data collection and transfer.
- Training of DoLS staff on the synthesis and digitization of survey data collected from outer islands.
- Training of DoE staff on environmental and social impact assessment
- Training of PWD staff on the structural maintenance of the GCF investments (Seabee, wave reflection wall and sand-filled geo-textile containers bags)
- Training of PWD staff members, NGOs, and CSOs on the application of ecosystem-based coastal protection
- Comprehensive training program designed targeting CCPU staff members

- Two regional conferences and/or workshop on coastal protection organized

1.2. Long-term national human resource capacity and awareness enhanced for sustainable coastal protection

45. In the specific context of Tuvalu, the capacity building support conventionally delivered in donor-supported projects has been insufficient to establish a foundation for sustainability. This is because typically the capacity building support in these projects is exclusively targeting the existing government staff, which is small in number, and the progress is immediately undone if the staff members leave the government system. This approach to capacity building represents numerous missed opportunities for transforming the country. Climate change adaptation is defined by UNFCCC as a series of "adjustments in ecological, social, or economic systems in response to actual or expected climatic stimuli and their effects or impacts" and by nature, it is an iterative, long-term process. Adaptation efforts in SIDS like Tuvalu must embrace, in their core principle, a strategy to build capacity of the entire country that goes well beyond that of the government system.

46. This activity in the GCF-financed project will establish a foundation for building a cadre of national experts in the long-run who will work in the relevant sectors for coastal adaptation. To this end, the project resources will expand the existing Government scholarship program and provide targeted support to at least 9 male and 9 female students who are currently outside of the government system. GCF resources will support students to study relevant disciplines for coastal management including environmental science, geography, earth science, civil and coastal engineering, oceanography and meteorology. Students currently enrolled in high school or undergraduate level studies will be targeted to pursue higher studies in one of the pre-identified institutions in the region. Students will be selected on the condition that they will work in the project (or other climate change adaptation projects) after completing the study for a predefined time period so that the newly gained skills are immediately put to use in the country. This coastal management scholarship program will be implemented in the first 4 years of the GCF project so that the students will have at least 2 years to apply their knowledge and expertise in the country and also obtain hands-on experience during the project implementation.

47. In addition, 6 students (minimum) who are currently enrolled in a master's level programmes in one of the disciplines described above will be recruited by the project to train them on coastal engineering, site planning, civil engineering, coastal vulnerability and feasibility assessments, design of coastal protection measures, and environmental and social impact assessment. These two types of capacity building support will help retain skilled labour, which may otherwise leave the country due to limited employment opportunities. For all the skill building activities envisaged, the gender target of 50% will be encouraged.

48. Long-term capacity building and awareness raising will also be expanded to school children based on the premise that children can be the most effective agent of change in society. GCF resources will be used to work with the Ministry of Education to refine/modify the primary school curriculum to include topics such as general awareness about climate change, climate change impact on atolls and coastlines, the concept of "moving islands" in which dynamic coastal processes are part of the natural island formation process, and anthropogenic stressors to coastal erosion apart from climate change. School teachers will be trained so that they become well-versed with these topics. The following indicative inputs will be financed and implemented for Activity 1.2.

- A scholarship program is designed with the Ministry of Education; criteria for selecting eligible candidates agreed by the second Project Board meeting
- Scholarship agreement made with at least 18 students
- At least 6 new graduates are identified and recruited to assist the government in implementing the project and in carrying out coastal vulnerability and environmental and social impact assessment
- Contractual agreement signed with the selected 6 students who are in a master's program relevant for coastal protection
- Training of trainer events organized specifically targeting school teachers
- Primary school curriculum modified and approved

Output 2: Vulnerability of key coastal infrastructure including homes, schools, hospitals and other assets is reduced against wave induced damages in Funafuti, Nanumea and Nanumaga

49. This Output, accounting for 77% of the total GCF investments, represents the investments in minimizing damages on high value assets in coastal areas in the three target islands of Funafuti, Nanumea and Nanumaga. The design of the intervention is guided by the Feasibility Study (Annex II) and three assessments, supported by UNDP, JICA and the World

Bank, which identified a range of coastal defense infrastructure options both in Funafuti and outer islands[21]. The angle and the protection of the toe of the structure will be finalized based on local hydrodynamic and coastal processes (wave, tide and current information) and topographic data. Therefore, the final adjustment of the design will be done during the first two years of the project. The adjustment of detailed drawings and production of BoQs will serve as a key milestone for the disbursement of the GCF grant for the subsequent projects (i.e. the construction of the coastal protection measures).

50. The World Bank study investigated the extent of the coastal protection needs and categorized the foreshores into three priorities of 1) vulnerable, higher value zones; 2) vulnerable, lesser value zones; and 3) less vulnerable zones. The findings from the preliminary assessment is summarized below[22]:

Island	Length of protection needed (m)	Height of protection (m)
Nanumea – All Higher value	1,900 760	3.0
Niutao - All Higher value	1,300 580	3.0
Nanumaga – All Higher value	780 450	3.0
Nui – All Higher value	1,420 750	3.0
Vaitupu – All Higher value	1,800 850	3.0
Nukufetau – All East & West Western exposure only	1,100 390	3.0
Funafuti (Lagoon side) – All Bulk of community High value south of port	11,400 9,000 3,600	2.0 Extensive beach rock permits higher toe
Nukulaelae – All Higher value	1,600 550	3.0
Niulakita[23]		4.5
Total – All (incl. Funafuti)	21,300	
Total – Higher value (incl. Funafuti)	7,930	
Total – All (excl. Funafuti)	9,900	
Total – Higher value (excl. Funafuti)	4,330	
Proposed length to be protected through GCF	Funafuti: 600 Nanumea: 760 Nanumaga: 450	
Total coastline	81,900	

Selection of Priority Islands

51. Alongside the review of suitable coastal protection options, discussions and selection of priority islands were carried out by national stakeholders. As a result, the main island of Funafuti, Nanumea and Nanumaga have been selected as target islands for the proposed GCF project. The selection of Funafuti was on the basis of several factors. The concentration of economic, social, political and institutional assets are likely to generate the largest impact from the GCF investment. Moreover, the JICA initiative has produced a feasibility study for the gravel beach nourishment work, which includes the detailed hydrodynamic and coastal processes, an ESIA, and financial and economic analysis. Nanumea and Nanumaga were among the four islands that have been severely damaged by recent Cyclone Pam.

[21] Note that the coastal investments financed by JICA (gravel beach nourishment) and Government (geo-textile sand retainer in Nukufetau) are still underdevelopment and the final results in terms of coastal protection impact have not been produced.

[22] Note a caveat in the tentative conclusion drawn in the WB assessment as a site inspection did not take place. The conclusion has been drawn from the assessment of aerial images only.

[23] Unlike all other atolls, Niulakita has an average elevation of about 4m above sea level. Hence, the level of urgency in coastal protection is relatively lower. For this reason, any coastal interventions with GCF resources are not proposed.

52. Based on the technical feasibility study (Annex II), it is proposed that the project resources finance locally appropriate coastal protection measures along the high value zone in Nanumea and Nanumaga (760m and 450m respectively) and 1,000m of high value zone in Funafuti. The proposed GCF project will also pave the way for interventions in the other islands, through site specific assessments in all of the islands in the project, which the Government of Tuvalu is keen to move on to in a subsequent application for funding to GCF.

Selection of Relevant Coastal Protection Options

53. The reports produced by UNDP, WB and JICA and Annex II discuss coastal protection options that have been tested around the world, especially in similar island settings. Table below presents some of the key options that have been reviewed in these reports with notable advantages and disadvantages. The cost estimates are based on the industry standard while incorporating relevant information such as the experience from the gravel beach nourishment work supported by JICA in Funafuti and similar work on remote islands in the Torres Strait.

Intervention options	Pros	Cons	Rate per m (Outer islands)	Rate per m (Funafuti)
Rock armor revetment	Structure is highly robust, which is an advantage when facing dynamic, worsening impact of climate change.	Materials need to be imported; the need to use heavy machinery limits local employment opportunities; landing facility is needed at site; Limits access to foreshore.	$12,054	$8,036
Pre-cast concrete (Seabee) revetment	Use of less material; high potential for local labor participation; if constructed on a gentle slope, it allows good access to the sea.	Needs a good foundation to avoid failure; landing materials in outer islands can pose a serious problem	$15,068	$10,045
Rigid seawalls (Stone pitch)	Undersized rocks could possibly be sourced locally.	Failure rates have been high in Tuvalu and therefore it has been excluded from the option (and no cost estimates are provided).	N/A	N/A
Quasi permanent Geo-textile container revetment	Suitable where there is limited landing facilities, as is the case in Tuvaluan outer islands; offer flexibility under uncertain level of climate threats; 25 years of design life or longer can be expected; potentially use of local materials; opportunities for local employment.	Not considered a permanent solution (susceptible to vandalism or degradation from UV), and thus, this option is excluded from Funafuti.	$8,370	N/A
Offshore wave break (Tetrapod)	In addition to attenuating the wave, it can create a boat haven; a milder wave climate reaching the shore allows the build-up of sand and the reduction in overtopping.	Degradation of water quality of lagoons in Funafuti; requires significantly larger units (than on the shore). Given these issues, the cost will be significantly higher than other options.	N/A	N/A
(Gravel) Beach nourishment	There is little influence on the surrounding coast; there is no hindrance to future regeneration of beaches with a supply of earth and sand.	A need for auxiliary facilities to maintain the design section due to littoral movement of earth and sand; gravel may be washed up on beaches during storms; the risk mitigation potential from severe storm may be smaller compared with some other hard-engineered solutions.	N/A	$9,866[24]
Wave return wall (optional)	Reduces the amount of water that enters into the community and to reduce the destructive force of water bores	Additional cost to the base structure	$1,488	$1,488

[24] The cost presented here is based on the actual investment currently undertaken in Funafuti.

54. Wave return wall presented above is an optional structure that is intended to reduce the amount of water that enters into the community and reduce the destructive force of wave bores. Thus, it will be incorporated into the crest of the pre-cast concrete revetment option that has been chosen in Funafuti.

55. Based on the comparison of the coastal protection options as well as their advantages and disadvantages, stone pitch walls and offshore wave break have been eliminated. Pitch wall was considered to have a high risk of failure while offshore wave break is expected to be too expensive and pose environmental risks in the marine ecosystem, especially under the current conditions in Funafuti where seepage of contaminated ground water into the lagoon, from septic tanks and livestock pens, is uncontrolled and significant.

56. In Funafuti, design considerations benefit from the fact that, inside the lagoon, the west-facing shores experience relatively small depth and fetch limited waves. This means that a higher degree of protection can be obtained with relatively smaller and less costly measures than on an open coast setting. As described in Annex II, it was concluded that rock armour revetment is most cost-effective option. However, this option's drawbacks include disruption of foreshore access, a critically important factor for this small island community. Thus, the rock armour revetment option (which will be used along 600m of vulnerable coastline) will be complemented by the limited use of pre-cast concrete (Seabee) revetment (along 400m) where maintaining access to foreshore is deemed needed.

57. In the two outer islands of Nanumea and Nanumaga, one local factor restricting the viability of many coastal protection options is the lack of landing facility in the islands, which precludes the two revetment options that are considered in Funafuti. As a result, geo-textile container revetment is considered a viable option. It can potentially be complimented with soft measures including beach nourishment and dune restoration. This Output comprises two key activities:

2.1. Coastal protection design, site-specific assessments and ESIA undertaken in all islands in a participatory manner

58. A detailed, participatory design and site-specific assessment will be carried out in all the islands in Tuvalu. This process is needed not only to make final adjustments in the design of the coastal protection measures (such as the angle of the structure and protection of the toe of the structure) to maximize the effectiveness and longevity of the structure for the three targeted islands, but also to equip the other, non-targeted islands, with the necessary information for attracting donor resources in the future, including from GCF. The multi-stakeholder, gender-responsive planning and design process will take place to ensure that beneficiaries are fully informed and are able to contribute to the detail design and functionality of the coastal protection measures in each of the islands. The process will, for example, look into how the target community (men, women, youth, and elderly) interacts with the ocean and coastline, which is an important design element of coastal protection infrastructure. The assessment will result in a set of adaptation options, detailed technical drawings, bill of quantity, tender documents and detailed costing of the interventions. As described earlier, this process will be used as an opportunity to provide hands-on trainings for government staff from the DLS, PWD and DoE.

59. In conjunction with the island-level assessment, a permanent survey benchmark will be established in each of the nine islands. Currently, there is plenty of survey replication on certain islands, and each time, a new permanent survey benchmark has to be established. Streamlining this process by creating one permanent survey benchmark on each island is necessary for ensuring consistency and continuity in data obtained through the survey work (to be promoted under Output 1 above). The following indicative inputs will be financed and implemented for Activity 2.1. for each island:

- Organization of community consultations to inform the engineering design and ESIA. It will be ensured that men and women will be given separate opportunities to express their views and concerns.
- Collection of wave, current and sediment data, public consultations and ESIA
- A national consultation and validation of the findings of the assessment.
- Establishment of a permanent survey benchmark engaging youth organizations to carry out surveys.

2.2. Coastal protection measures implemented

60. GCF and government resources will be used to put in place a robust coastal protection infrastructure along 2,210m of vulnerable coastlines of Funafuti, Nanumea and Nanumaga to defend high value assets of the targeted islands. This translates to targeting nearly 28% of the high value zone of the country, which currently has no protective measures. Also this represents 10% of all vulnerable coastlines in the country. The design criteria are set such that the design will reflect the projected sea level rise and notional 200-year return period storm surge events. Geo-textile container revetments in

Nanumea and Nanumaga will have minimum design life of 25 years; but, with the appropriate selection of vandal resistant bags for the top layer walls and, training of PWD and community members for monitoring and simple repair, the life expectancy is expected to be longer.

61. In Funafuti, a combination of rock armor revetment and pre-cast concrete revetment options is considered most cost-effective. These options can potentially be complemented by softer, ecosystem-based coastal protection approaches that are considered locally appropriate. In Nanumea and Nanumaga, as described above and in the Feasibility Study (Annex II), the geo-textile container revetment is considered a technically feasible option. This will likely be complemented by EBA approaches including beach nourishment and dune restoration/management.

62. Along with the island-level assessments proposed under Activity 2.1, the construction process will offer critical opportunities for providing a real exposure for government officers to the new coastal protection technologies that have never before been introduced to Tuvalu. PWD staff as well as those Tuvaluan students who are financially supported by GCF resources to obtain technical skills in higher studies are relevant target audience for this opportunity. The proposed interventions also offer local employment opportunities especially during the construction. During the construction process, it is expected that 20 temporary jobs in each island are created (60 jobs total).

63. The GoT has made a commitment to allocate approximately US$2.86 million for the duration of the project (or US$128,713 per year over the 15-year period). This comes from a recently established expenditure in the central government system called the Infrastructure Maintenance Budget (see confirmation of co-financing in Annex IV).

64. The following indicative inputs will be financed and implemented for Activity 2.2.

- Construction of coastal protection infrastructure in Funafuti, Nanumea and Nanumaga covering 2,210m of vulnerable coastlines
- Organization of community consultations for handover of the assets
- Engaging youth based organizations to play a role in monitoring on a quarterly basis during and after project implementation

Output 3: A sustainable financing mechanism established for long-term adaptation efforts

65. Adapting to climate variability and change requires iterative adjustments in ecological, social and economic systems, and the availability of financial resources is a key prerequisite for successful adaptation efforts. Yet, the GoT's high dependence on foreign aid, and its volatility, makes the long-term planning for public investments difficult. Foreign aid is often earmarked to specific purposes leaving little possibility for facilitating autonomous adaptation. In outer islands, however, there are Falekaupule Trust Fund (FTF) and Special Development Expenditures (SDE), which provide a somewhat steady income to island administrations for executing priority investment activities. There is a growing recognition that the Island Strategic Plan (ISP) should be used to identify development priorities in each island and to allocate finite financial resources for achieving the priorities. There is also a recognition that the process of formulating the ISP should become more participatory, pro-poor, gender-responsive and climate-smart. Notwithstanding Tuvalu's negligible contributions to climate change, island communities are already investing their own resources for responding to climate threats. In support of this, UNDP is currently assisting island administrations to explicitly linking the ISPs and FTF/SDE while integrating adaptation and coastal natural resource management concerns into ISPs. The Department of Rural Development is currently pilot testing the use of a performance-based fiscal transfer mechanism in three islands to incentivize the island administrations for effective formulation and use of the ISP.

66. The implementation architecture for this sub-component will leverage the baseline developed by the two preceding UNDP supported projects. Currently, there is a team in these projects supporting the iterative process of island development planning, budgeting, execution, and monitoring. Importantly, the proposed GCF project will also build on the foundation in terms of community awareness about these process, which can take a long period to establish. To leverage the ongoing UNDP efforts in this regard and maximize transformational potential of GCF investments, all outer islands will be supported through this Output. A Public Financial Management officer, who is in place in the Department of Rural Development has responsibility to monitor the use of top-up discretionary grants provided to island administration. The complementarity between the ongoing UNDP-support and the proposed GCF project as well as the additional contributions of the latter, in the context of enhancing climate-sensitive planning and budgeting process at the outer island level, are presented in a table below:

LDCF/GEF TF projects	GCF project

• Initial awareness raising activities about ISPs, climate change and the need for stronger island-level development planning, budgeting and execution for climate resilience • Compilation and analysis of existing ISPs • Training of facilitators from each island for reviewing ISPs • Formulation of disaster readiness plan • Conducting the first Climate Public Expenditure and Institutional Review • Climate resilient ISP formulation and budgeting support (2016-2019) focusing on marine based coastal livelihoods, DRM and ecosystem management • Compilation and analysis of new ISPs (2017-2019) • Review of ISP performance (2016-2019) using community scorecards and participatory videos.	• Expansion of performance-based resources made available for priority critical procurements as a financial incentive for more participatory, gender-responsive, pro-poor and climate-smart ISP planning, budgeting and execution. • Continued training on facilitators for participatory ISP formulation and budgeting with focus on coastal protection (2017-2023) • Follow-up analysis on Climate Public Expenditure (conducted by project staff and Ministry of Finance) to monitor the progress/trend on climate-responsive budgeting at the island and national level • Compilation and analysis of new ISPs (2017-2023) • Review of ISP performance (2017-2023) using community scorecards and participatory videos.

It is important to emphasize that the most notable GCF contributions for this Output is the extended continuity it brings to support this new concept of island level planning and budgeting process. It is commonly understood that the process of introducing/strengthening accountability, transparency and responsibility to subnational administrations takes many years of assistance. The ongoing UNDP support is crucial in introducing climate change and ecosystem management concerns into the existing ISP process while the GCF project will enable continued assistance in a seamless manner, extending the timeframe of assistance from 4 years to possibly 9-10 years.

67. For sustainable financing mechanisms to support adaptation efforts, it is also important to look at GoT's financial capability to immediately assist those affected by climate change induced natural disasters including tropical cyclones. This is because no coastal protection is sufficient to completely eliminate future damages, especially when super cyclones, such as Cyclone Pam, hit the country. While the GCF investment will alleviate damages to key infrastructure assets by attenuating wave energy directly striking the land, it is equally important to ensure that GoT is capable of immediately extending support to those affected by extreme events without waiting for external donors support. To this end, GCF resources will be used to rebuild key economic and social assets in the aftermath of natural disasters. The operational process of selecting beneficiaries and releasing financial resources will follow an existing national mechanism. For example, in the Tuvalu Climate Change and Survival Fund (CCSF)[25], a community seeking support puts forward a request for assistance, which is assessed by a Committee, comprising government departments and Tuvalu National Council of Women. After damages from a natural disaster are independently assessed, an approval decision will be made by a Board that comprises a Minister, a government officer and the General Secretary of Tuvalu Red Cross. The most appropriate fund management modality will be explored with currently considered options being the CCSF and/or UNDP managing the fund. Annex XIII Additional Background Details contains the management structure of the CCSF.

68. This Output comprises the following activities:

3.1. All Island Strategic Plans and annual budgets integrate island-specific climate risks through gender sensitive, participatory processes

69. Tuvalu is transitioning to a new development paradigm. Previously, public service delivery to outer islands was primarily driven by the central government, whose development finance in turn was largely dependent on foreign aid. The Falekaupule Act of 1997, which is also known as the Local Government Act, ushered in the current two-tiered governance system that comprises the national government and island-level administrations. This act devolved the local governance authority to the island council (*Kaupule*), which is the executive arm of island assembly (*Falekaupule*), to implement national and community-level development priorities. In principle, this puts local communities, led by respective *Kaupules*, at the center of local development process. The Act also gave rise to the ISPs and to financial allocation systems to support the implementation of the development priorities identified in ISPs. Falekaupule Trust Fund (FTF) was established with donors' financial assistance (New Zealand, Australia, Japan, and Republic of Korea) along with the enactment of the 1997 Act to supplement the financial needs of outer island development. FTF distributions to outer islands are on average $64,000 per year for fulfilling their development needs.

[25] The CCSF was established as of 1 January 2016 and the Government of Tuvalu and Australia has already committed to inject an initial contribution of approximately US$5 million and US$3.5 million, respectively, into the Fund.

70. Financing from the LDCF and GEF Trust Fund is currently supporting *Kaupules* to build basic skills for accounting and facilitating a participatory development planning process, while integrating climate change and natural resource management concerns into the ISPs and using SDE/FTF as a financing source for implementation. With multifaceted constraints – institutionally and financially – that dictate the way development is carried out in the country, the use of these two sources of funds underpinned by the ISP presents one of the most reliable sources of financing for development in the country. Since 2016, the Department of Rural Development is further advancing the ISP support by introducing an incentive mechanism in three pilot islands of Nanumea, Nukufetau and Nukulaelae. In the pilot test, those *Kaupules* whose performance is evaluated satisfactory (based on pre-determined criteria such as participation, result-orientation, accountability, etc.) would receive additional discretionary grant. This will give an incentive for *Kaupules* to accelerate their efforts for integrating climate change concerns into ISPs and generally improving local governance.

71. Successful climate risk mainstreaming into ISPs and effective use of available domestic financing will facilitate island-led actions, enhance planned and autonomous adaptation, and ultimately, increase resilience at the island level. In the context of coastal interventions envisaged in the GCF project, a strengthened ISP process will improve longer-term impact and replication potential of the GCF investments as domestic resources, allocated through ISPs, are expected to be used to maintain the GCF investments and to expand the coastal protection coverage. For the expansion of coastal protection measures beyond donor-assisted projects, lower-cost ecosystem-based approaches are a more realistic option given the limited available finance domestically. This activity will strengthen the critical foundation to facilitate this process.

72. In addition, GCF resources will be made available to address urgent procurement needs to address recovery and response after the aftermath of extreme events in full alignment with an existing process such as the CCSF. The underlying rationale for such support is that the extent of GCF contributions towards the overall vulnerability reduction of the country will be enhanced if the project supports the costs of both anticipatory adaptation (through Output 2) and early response and recovery needs from residual damages. With GCF support, the GoT will be able to provide immediate vital services to the people of Tuvalu in combating the devastating impact of climate change and natural disasters and allow the GoT and the people to respond to disaster events in a coordinated, effective and timely manner. To ensure efficiency, the process of approval will likely follow an existing national mechanism such as that of the CCSF. The most appropriate fund management modality will be explored with currently considered options being the CCSF and/or UNDP managing the resources for the duration of the project. Under the CCSF, the fund account is held at the National Bank of Tuvalu. The fund is governed by the CCSF Board comprising of the Minister of Finance and Economic Development, General Secretary of Tuvalu Red Cross, and Permanent Secretary for the Ministry of Home Affairs. The fund becomes accessible only after a national state of emergency arising from a list of pre-identified natural disasters (See Annex XIII – Section G) is declared. The need for financing for early response and recovery, for which the financial support from the fund is requested, must be presented by the community affected by a natural disaster in the form of a proposal a (template will be made available). Decisions to support such requests will be based on a review of a proposal by a nine-member committee against criteria that is made public. The committee will include a representative from the Tuvalu National Council of Women. The committee also prepares a financial report on the utilization of the Fund on an annual basis for the review by the National Advisory Council on Climate Change (NACCC), Natural Disaster Committee (NDC), the Cabinet and UNDP. The use of the fund for operating expenses of the CCSF committee or to be reversed into the general account will be prohibited. Every six months, the Minister of Finance and Economic Development will be required to transmits the Auditor-General the account showing fully the financial position of the CCSF; and the Auditor-General is expected to prepare an audit report and present it to the Parliament.

73. To reduce vulnerability of Tuvalu and, ultimately, build the resilience of the country to future impact of climate change, a combination of options are needed. Construction of coastal defense, which is supported under Output 2 of the project, is one option. Yet, the country also needs financial resources at their disposal to kick-start early response and recovery work after natural disasters, from which the existing defense is incapable of eliminating the damage. The following indicative inputs will be financed and implemented for Activity 3.1.

- National training of trainers (ToT) workshop organized for incorporating climate change risks, including coastal threats, into ISPs targeting kaupule representatives, minority groups, Department of Rural Development staff, NGO staff and women's group representatives. This workshop will also cover skill building for prioritization and budgeting of adaptation action items in an annual budgeting process. Youth and women's groups will also be included in these trainings
- Facilitation of outer island workshops to integrate climate risks into the existing ISPs and to produce/enhance annual budgets and presentation of the new ISPs to communities

- Compilation, analysis and reporting of all outer island annual budgets. This report will be shared with all other islands and used in the following year to guide iterative planning and budgeting process
- Release of performance-based resources to meet costs of priority procurements as a financial incentive for more participatory, gender-responsive, pro-poor and climate-smart ISP planning, budgeting and execution
- Operational and financial arrangement finalized for community-based disaster early response/recovery support

3.2. Capacity of Kaupules, Falekaupules and community members strengthened for monitoring coastal adaptation investments

74. GCF resources will also be used to strengthen the capacity of both outer island administrations and community members for monitoring, reporting and verifying the progress of adaptation investments as an integral element of ISP support. Due to the special geographical condition of Tuvalu where islands are several days away from the central government, upward accountability to the central government and downward accountability to citizens can easily be diluted among *kaupules*. Thus, nurturing the sense of oversight among community members becomes critical for ensuring transparent, sustainable, demand-driven service delivery. Support to ISP formulation, budgeting and execution, the focus of Activity 3.1, and support for community members for an independent oversight of the ISP process, the focus of Activity 3.2, must go hand-in-hand. At the same time, outer island administrations also need to develop their capacity to report the use of resources and progress of investments to their constituents.

75. To assist the process of increasing capacity for monitoring, and ultimately accountability, two specific tools will be supported, building on the work of the two UNDP baseline projects. First is a community scorecard where selected representatives from various interest groups such as women, youth, minorities, the disaster management committee, fisher's association, and Red Cross volunteers, assess performance of outer island administrations in terms of the use of island resources for the agreed purposes as outlined in the annual budget and ISP. This scorecard entails criteria such as "completion of proposed projects", "level of beneficiary engagement" and "targeting of proposed beneficiaries", and they will be linked to the performance criteria described above. Secondly, a participatory video tool will be continually supported. This tool has been tested in the region to enhance the accountability and information exchange of community-based climate change small grant projects. Video footages provide visual verification of successful executions of ISP priorities by *kaupules*. Women's group members are provided with a hand-held video with which they record the public service support delivered. The videos are periodically collected and compiled by the ISP Officer recruited in the project and shared with *kaupule* members and other community members as best practices. This tool has been used in countries like Samoa where monitoring by central government is similarly difficult and has proven to be effective in raising awareness and sense of accountability. A national level ToT in Funafuti will train members of women's association to use a camcorder, develop a story-board, record their planned approach and edit their video to present their message.

76. Financial assistance from GCF will be sequenced and/or combined with the ongoing baseline UNDP projects that support the architecture for ISP formulation and budgeting and for nurturing a stronger sense of accountability framework. The LDCF and GEF Trust Fund projects have been under implementation since 2013 and 2015, respectively, and will run for the period of 4 years. Building on the foundation of these two initiatives, the GCF project will continue the support to building the capacity of *Kaupules, falekaupules* and community members for effective and transparent governance for climate change adaptation and natural resources management. The following indicative inputs will be financed and implemented for Activity 3.2.

- Outer island level awareness raising events organized targeting different interest groups such as women, youth, disaster management committee, fisher's association, and NGOs about monitoring and maintenance needs of the coastal investments (in the island of Funafuti, Nanumea and Nanumaga) and the needs for ecosystem-based adaptation for all the islands (Following Activity 1.1)
- A national ToT events organized inviting representatives from these interest groups for participatory video.
- Technical assistance on the use community scorecard is provided once a year in which representatives from communities, covering different interest groups assess the performance of outer island administrations
- National level consultations organized targeting *Kaupule*, *Falekaupule* and community members to review the process of annual budgeting, monitoring and evaluation for coastal protection.

C.4. Background Information on Project / Programme Sponsor (Executing Entity)

77. The United Nations Development Programme has been requested by the Government of Tuvalu to execute this GCF project. UNDP has extensive experience as the Executing Entity of climate change adaptation projects globally. The total size of the climate change adaptation portfolio in which UNDP is playing the role of the Executing Entity amounts to US$40 million.

78. UNDP's experience in supporting Pacific SIDs has also been significant, and growing, delivering an average of approximately US$30 million per annum across 15 Pacific SIDs through 4 offices[26]. In partnership with national governments, UNDP support hard and soft investments at all levels, from communities to local and national government and regional entities in order to strengthen inclusive growth, better services, environmental sustainability, good governance, and security that are fundamental to building resilience and sustaining development results. As a Global Environment Fund (GEF) agency and Adaptation Fund (AF) Multilateral Implementing Entity (MIE), UNDP has past and ongoing initiatives related to enhancing climate change and disaster risk resilience in food, water, and energy sectors.

79. In Tuvalu, UNDP has a long history of successful partnerships with the Government in the area of governance, trade, climate change, gender, and environmental/natural resource management at both national and international levels. These include, but not limited to, successful joint efforts in: NAPA, NAP, SNC and NBSAP, mainstreaming of environmental sustainability into national policies, planning frameworks and programs, local governance strengthening, parliamentary support, and trade advisory services, etc. In addition, UNDP, in collaboration with Tuvalu Association of NGO (TANGO), has been assisting the GoT in promoting community-based management of marine resources through GEF Small Grant Programme (SGP). Furthermore, supporting the government's aspiration for enhanced outer island-level governance and participatory decision making has been an important area of UNDP's work. UNDP's assistance for local governance reform in Tuvalu dates back to 1997 when the Falekaupule Act was enacted and the process of devolution of authority first began. Since 2005, support for more institutionalized outer island development framework has been provided through the Strengthening Local Governance project. Capacity of Kaupule to formulate ISP was strengthened.

80. At the regional level, UNDP, in partnership with other regional agencies and UN agencies, supports Pacific SIDs in addressing critical sustainable development challenges in the areas of: climate change adaptation and mitigation, fisheries, integrated water resource management, disaster risk resilience. Recent and/or ongoing initiatives include:

- The Pacific Adaptation to Climate Change Programme (and PACC+). $20 million over 5 years to support policy development, governance and implementation capacity for 13 PICs (including all host countries) to pilot food security, water security and coastal management resilience projects
- The Pacific Island Greenhouse Gas Abatement through Renewable Energy Project (PIGGAREP) $8.225 million over 6.5 years to support and enabling environment for RE investment and delivery of practical RE solutions
- "*PAS: Implementing Sustainable Integrated Water Resource and Wastewater Management in the Pacific Island Countries - under the GEF Pacific Alliance for Sustainability (Pacific IWRM) Project,*" GEF TF US$ 9.03M, 14 Pacific SIDs, GEF Agency: UNDP, Executing Agency: SPC-South Pacific Applied Geoscience Commission (SOPAC), Focal Area: Integrated Water Resource Management (IWRM), Completed
- "*R2R: Testing the Integration of Water, Land, Forest & Coastal Management to Preserve Ecosystem Services, Store Carbon, Improve Climate Resilience and Sustain Livelihoods in Pacific Island Countries,*" GEF TF US$ 9.83M, 14 Pacific SIDs, GEF Agency: UNDP, Executing Partner: SPC-SOPAC, Focal Area: IWRM
- "*Enhancing Capacity to Develop Global and Regional Environmental Projects in the Pacific*" GEF TF US$ 1M, 14 Pacific SIDs, GEF Agency: UNDP, Executing Partner: SPREP, Focal Area: Multi-focal
- *"Pacific Risk Resilience Programme (PRRP)"*, Australia US$ 16.1 million, Fiji, Solomon Islands, Tonga, and Vanuatu, Direct Implementation by UNDP, Executing Partner: Live and Learn, Focal Area: Disaster and climate risk management and governance
- *"Enhancing Capacity to Develop Global and Regional Environmental Projects in the Pacific,"* GEF TF US$ 1 million, 14 Pacific SIDs, GEF Agency: UNDP, Executing Partner: SPREP, Focal Area: Multi-focal
- *"Pacific Islands Oceanic Fisheries Management Project (PIOFMP 1)*," GEF TF US$ 10,946,220, 14 Pacific SIDs, GEF Agency: UNDP, Executing Agencies: Pacific Islands Forum Fisheries Agency (FFA); Secretariat of the Pacific Community (SPC), Focal area: Fisheries, Completed
- *"Implementation of Global and Regional Oceanic Fisheries Conventions and Related Instruments in the Pacific Small Island Developing States (PIOFMP 2)*," GEF TF US$ 10 million, 14 Pacific SIDs, GEF Agency: UNDP and FAO, Executing Agencies: Pacific Islands Forum Fisheries Agency (FFA); Secretariat of the Pacific Community (SPC), Focal area: Fisheries, Ongoing

[26] Pacific office, Samoa Multi-country office, Solomon Islands Sub-office, and PNG Country Office. These offices collectively cover 15 countries in the Pacific Islands (Samoa, Tokelau, Niue, Cook Islands, Tonga, Tuvalu, Fiji, Vanuatu, Solomon Islands, Nauru, Kiribati, Federated States of Micronesia, Palau, Papua New Guinea, and Republic of the Marshall Islands). Tuvalu is covered by the Pacific Office. Total Programme Expenditures between 2010 – 2014 are estimated at US$ 147 million.

81. Globally, UNDP works in nearly 170 countries and territories and it focuses on helping countries build and share solutions in three main areas of sustainable development: democratic governance and peacebuilding, and climate and disaster resilience, all of which contribute to the achievement of poverty eradication, reduction of inequalities and exclusion. Long-term capacity building of partner countries is a critical element of UNDP's approach to work. The proposed GCF project is in line with the underlying principles of UNDP's mandate: The project contributes to reducing the vulnerability of a SID to imminent climate risks while contributing to the capacity building of the nation at all levels.

C.5. Market Overview (if applicable)

82. Coastal protection fulfills the characteristics of "non-excludability" and "non-rivalry" and thus it is considered as a pure public good. Thus, there is no market and services of coastal protection need to be provided through government interventions.

C.6. Regulation, Taxation and Insurance (if applicable)

83. Based on Section 8 of the "*Environmental Protection Regulations 2007/2014*," a preliminary environmental impact assessment[27] is required before the commencement of the project. During the project implementation, a full-fledged ESIA will be carried out. In addition, the project will be subject to UNDP standard Social and Environmental Safeguards (SES) Policy and the screening procedure (SESP).

84. Foreshore and Land Reclamation Act 2008 is another regulation relevant for the proposed GCF activities. In particular, the Act stipulates the following aspects which are part of the proposed project activities: a) ownership of the foreshore; and b) license to extract aggregates from the foreshores.

85. As per the Act, the foreshore is owned by the Crown (Section 3.1 of the Act). Thus, if the coastal protection interventions will be implemented only in that section of the coast, it is expected that no obstacles exist for the project (provided a full endorsement is obtained through public consultations). In case the coastal protection interventions will be implemented beyond the foreshore, authorization form the Minister is required for reclamation of land over and upon the foreshore (Section 4.1 of the Act) (See Annex XIII for the Letter of Authorization). For extracting aggregates from the foreshores, an approval from the *kaupule* will be required (Section 3.3 of the Act). Project Manager will be responsible for obtaining and maintaining the licenses and permits that are required for the project intervention.

C.7. Institutional / Implementation Arrangements

86. The project will be implemented following UNDP's Direct Implementation Modality (DIM) at the request from the Government of Tuvalu and the GCF National Designated Authority. The official request from the Government is included in Annex XIII. UNDP's role in this project is two-fold:

87. First, as an Accredited Entity to GCF, UNDP's overall role is to provide oversight and quality assurance through its Headquarter, Bangkok Regional Hub (BRH) and Pacific Office units. This role includes: (i) project preparation oversight; (ii) project implementation oversight and supervision, including financial management; and (iii) project completion and evaluation oversight. It also includes oversight roles in relation to reporting and knowledge-management. The '**project assurance**' function of UNDP is to support the Project Board by carrying out objective and independent project oversight and monitoring functions. This role ensures appropriate project management milestones are managed and completed. Project assurance is independent of the Project Manager and Project Management Unit; therefore, the Project Board cannot delegate any of its assurance responsibilities to the Project Manager or other members of the PMU. A UNDP Programme Officer, or M&E Officer, at the Country Office with support from the UNDP's Global Environmental Finance Unit, typically holds the Project Assurance role on behalf of UNDP.

88. Second, at the request of the GoT, UNDP will serve as Executing Entity for this project. In this capacity, UNDP will be establishing a Project Management Unit which will be responsible for the execution of the proposed GCF project in close collaboration with the GoT and other non-government partners. Any inputs related to Project Execution (e.g. the costs of project management staff for the duration of the project; costs for project inception, Steering Committee and other stakeholder meetings; costs of independent external evaluations; and costs for monitoring/evaluation-related travel of project staff to the field sites) have been costed and budgeted in the Project Management Costs.

[27] For the purposes of the UNDP process, the term "environmental and social impact assessment (ESIA) is used

89. Under the DIM arrangement, UNDP assumes the responsibility for mobilizing and applying effectively the required inputs in order to reach the expected outputs. UNDP assumes overall management responsibility and accountability for project implementation. Accordingly the PMU is subject to UNDP policies and procedures.

90. Throughout the lifetime of the project, the project assurance and execution roles of UNDP will be strictly separated.

91. The Project Board (PB) will be co-chaired by UNDP's Resident Representative or his/her deputy and the National Designated Authority. The PB is comprised of the OPM, DoE, PWD, DLS, DRD, MoE and a representative from the NGO association (TANGO) and Tuvalu Council of Women. The DRD and TANGO will be the Senior Beneficiary. PB[28] meets twice a year and is responsible for approving, by consensus, the Annual Work Plan prepared by the Project Manager, and making management decisions when guidance is required by the Project Manager. PB decisions will be made in accordance with standards that shall ensure management for development results, best value money, fairness, integrity, transparency and effective international competition. In case a consensus cannot be reached within the Board, final decision shall rest with the UNDP Resident Representative.

92. UNDP also participates in the PB as '**senior supplier**' to represent the interests of the parties which provide funding and/or technical expertise to the project (designing, developing, facilitating, procuring, implementing). The senior supplier's primary function within the Board is to provide guidance regarding the technical feasibility of the project. The senior supplier role must have the authority to commit or acquire supplier resources required. If necessary, more than one person may be required for this role.

93. The **Project Manager** (PM) will run the project, under guidance of the Project Board and day-to-day supervision by UNDP and GoT within the constraints laid down by the PB. The PM[29] function will end when the final project terminal evaluation report, and other documentation required by the GCF and UNDP, has been completed and submitted to UNDP. The PM is responsible for day-to-day management and decision-making for the project within the Annual Work Plan approved by the PB and reviewed by UNDP. The PM's prime responsibility is to ensure that the project produces the results specified in the project document, to the required standard of quality and within the specified constraints of time and cost. The Project Manager will have a matrix reporting arrangement to the UNDP Pacific Office and the GoT.

94. **Project-support**: The PM will be part of and supported by the Project Management Unit (PMU) which comprises of a group of project-financed staff. The PMU will be located in Funafuti with several staff members outposted in the UNDP Pacific Office. The PMU will be responsible for supporting the PM in carrying out day-to-day activities of the project, the overall operational and financial management, and liaison with relevant stakeholders for the project. The PMU will be located within the Climate Change and Policy Unit. The PMU comprises of the following positions:

Funafuti-based

- Deputy Project Manager: The DPM is responsible for assisting the PM in every aspect of project management but will specifically be responsible for liaison with key stakeholders in the project.

Fiji MCO-based

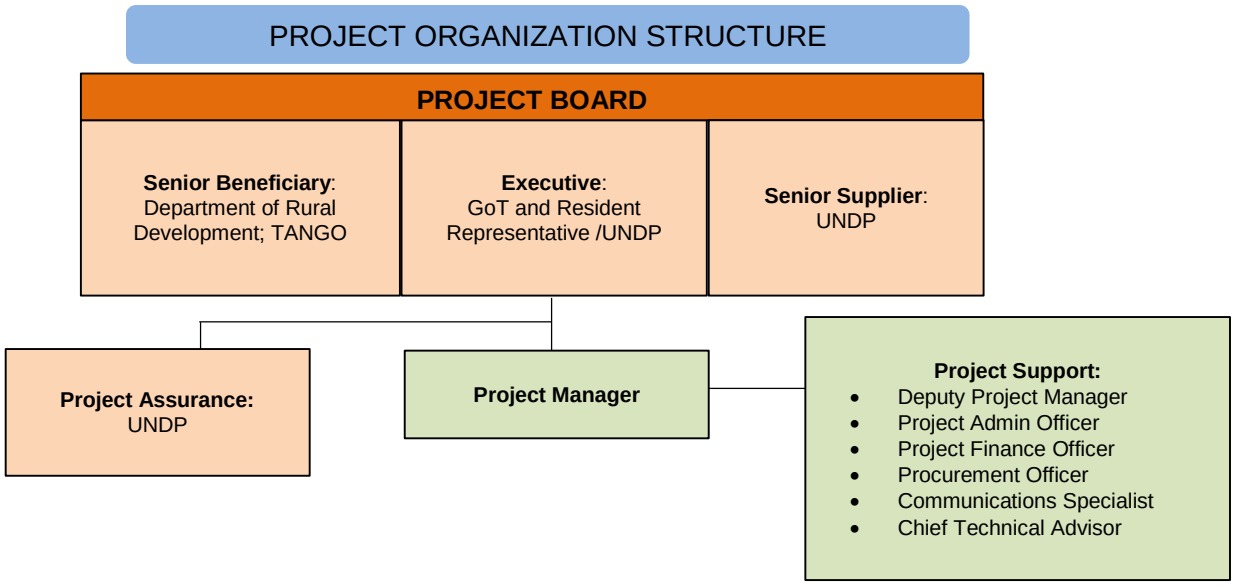
- Project Admin Officer: The AO is responsible for setting up and maintaining the project accounting system, monitor quarterly and activity-wise expenditures vis-à-vis Annual Work Plan, prepare budget revision, process payment requests, update financial plans, and prepare status reports and other financial reports.
- Project Finance Officer: The FO is responsible for the financial management of the project including the overall budget expenditures according to the Project Document, advising the Government, PMU and UNDP on the need for budget revision and/or off-track activities, and presenting financial analysis at Project Board meetings.
- Communications Specialist: The Communications Specialist is responsible for internal and external communications for the project including periodic update and dissemination of results achieved, synthesis and analysis of lessons learned, and production of various communication materials such as videos, photo stories, blog articles, etc.
- Procurement Officer: The Procurement Officer will oversee every procurement that takes place in the project including individual contracts and institutional contracts.

28 Sample ToR for Project Board: http://cfapp2.undp.org/gef/documents/1/g5710/g2_20672/PIMS3603TORProjectBoard.pdf
29 Sample ToRs for project manager: http://cfapp2.undp.org/gef/documents/1/g5710/g2_20672/PIMS3603TORProjectManager.pdf; Sample ToR for Project Administrative and Financial Assistant: http://cfapp2.undp.org/gef/documents/1/g5710/g2_20672/PIMS3603TORProjectFinanceAdmin.pdf

- Chief Technical Advisor: The CTA is responsible for bringing in international best practices to the implementation of the project and train the technical personnel in the PMU. The CTA will be an international staff under UNDP contract. CTA will be hired for the duration of the project. While the CTA will be based in Fiji, he/she is expected to spend 70-75% of time in Funafuti.

95. Responsible Party: UNDP will invite the Ministry of Education as a responsible party who will bear the direct responsibility for the execution of the activities related to scholarship project. This is based on the fact that the MoE has been administering national scholarship programmes over years and it is considered more effective and efficient if the focal agency for all scholarships remains the same.

96. The management arrangements for this project are summarized in the chart below.



97. **Construction and supervision methodology with key contractual agreements:** Construction of coastal protection measures will be carried out by a construction company selected through an international tender (where local companies will also be able to bid). Furthermore, before the selection of the international tender for a construction company, island-level assessments will be carried out by an institution that is different from the one responsible for the construction. The assessments and construction of the coastal protection measures will be carried out by entities identified through a competitive tender process according to UNDP policies and guidelines. The assessment process will result in, inter alia, detailed technical designs and Bill of Quantity for the specifications based on the design. The detailed design will in turn be used to inform potential vendors the scope of work required so that they can submit their bid. Independently, a site supervisor will be recruited who, on behalf of the Government (PWD) and UNDP, will play a liaison with the construction company while ensuring that the construction is carried out as per the specifications, timeline and environmental and social safeguards agreed.

98. **Operational arrangements post-construction:** The built infrastructure financed with GCF financing will be handed over to the Government of Tuvalu and community in the final PB meeting of the project as per standard UNDP procedures. Putting in place mechanisms for monitoring, operations and maintenance (O&M) of coastal protection measures, and building associated institutional and community capacities for the O&M, during and beyond the project implementation, is one of the important design principles for this project. For more details, please refer to Section D.2 Exit Strategy and Annex XIII – O&M Plan.

C.8. Timetable of Project/Programme Implementation

99. The implementation schedule with detailed activity progress timeline and output completion is provided in Annex X.

D.1. Value Added for GCF Involvement

100. **Scale up investments in critical coastal infrastructure:** GCF will deliver real benefits, in terms of reduced risks from cyclone or wave overtopping events, to 29% of the population in one of the most vulnerable countries in the world to climate change. The level of coastal protection will significantly increase from the current 570m to 2,210m after GCF involvement. GCF involvement in setting up coastal defense in Tuvalu is required due to the combined impact of sea level rise and intensifying tropical storms. At a rate of 5mm/annum since 1993, sea level rise in Tuvalu is between 28-44% higher than the global average. More concerning, it is significantly faster than the rate of natural island formation/reformation process. In the absence of climate change, a natural island formation process are commonly in a state of dynamic equilibrium, although in many cases, islands actually increase in size through consistent upwelling. In a state of equilibrium, natural erosional force on one side of the island is usually compensated by the deposition on other parts of the island or cyclone events create natural berms by corals and rubbles that are washed up, which overtime increases the overall resilience of the island to cyclones. Longshore drift through hydrodynamic process then move the sediment across to other areas of the island. In cases where sea level rise is faster than the natural island formation process, coupled with intensifying cyclones, it inevitably calls for robust coastal protection that is being proposed as part of this project.

101. The existing level of coastal infrastructure, or lack thereof, suggests the counterfactual of what Tuvalu would look like without GCF involvement. Despite the periodic devastation inflicted by tropical cyclones, other wave-overtopping events in the past and the country's evident vulnerability, Tuvalu does not have a single engineered coastal protection infrastructure that has been designed to withstand higher sea-levels and stronger wave actions. The first two initiatives (LDCF/UNDP/GoT and JICA) are only now underway to protect key assets under some level of protection along 570 meters of Tuvalu's 82km coastlines (of which 7.9km is considered high-value vulnerable coastlines). Underinvestment on coastal protection in the country is due to a mix of barriers. Some of these barriers have roots in Tuvalu's limited and dispersed land mass as well as geographic remoteness. Tuvalu is doubly disadvantaged due to its small economy: the size of the country and economy makes Tuvalu highly vulnerable to climate change effects by limiting resources at their disposal to promote adaptation; and the viability of development support activities, in economic terms, is diminished more for smaller economies. Without support to reduce the vulnerability of Tuvaluan coastlines, it will inevitably be only a matter of time, if climate change continues unmitigated, that relocation away from the Pacific is the only economically cost-effective option, which is not considered as an option by the GoT.

102. **Address financial and technical barriers to coastal adaptation**: Solutions to reduce the vulnerability of Tuvalu to the future impact of climate change require a large financial investment and long-term engagement, which the GoT cannot currently draw upon from either the domestic resources or the existing funding sources such as LDCF. Not only is the design and construction of robust coastal protection expensive (and in light of Tuvalu's limited economic standing, it is unlikely to pass a cost-benefit test), highly technical skills are needed for successful execution, which relevant departments such as PWD and DoLS do not possess; and, yet, large capital investment required usually put coastal protection beyond the scope of projects conventionally financed by bilateral donors or other adaptation funds that are available to the country today. The scope envisaged in the proposed GCF project is such that it allows the GoT to address both the financial needs for robust coastal protection as well as the long-term support to build the technical capacities within the Government to design, monitor and maintain the results expected from the GCF investment.

103. The lack of technical capacity within these departments is compounded by the small (economic and geographic) size of the country – unique to SIDs in the Pacific and around the world. With the total population barely over 10,000, the country is significantly disadvantaged even in comparison with other LDCs in terms of the *potential* for building national capacities and preparing for the new set of climate change-induced challenges it will face in the future. The types of capacity building support targeting broader Tuvaluan society (such as youth), which is critical for long-term sustainability of the results from the project, would be beyond reach without GCF involvement.

104. **Significant outreach to support the most vulnerable**: The proposed GCF project will put additional 3,100 people directly (or 29% of the total population) and another 3,499 people indirectly under coastal protection coverage along 2,210m of vulnerable coastlines. Considering that, as of today, the country is devoid of any robust coastal protection infrastructure (with the exception of 570 meter of coastlines along which UNDP/GoT and JICA projects are currently designing one), the magnitude of vulnerability reduction expected from the proposed GCF involvement is significant. The

value of its involvement, in turn, is expressed in the form of reduced or avoided damages borne by the most vulnerable populations in terms of economic damages to houses, crops and other public infrastructures and social disruptions. The economic analysis presented in Section F.1 and Annex XII shows that the annual benefits of the project in terms of reduced damages could reach up to $667,000 over 40-year time period for which analysis was undertaken. As described earlier, without GCF involvement, it is likely these populations will continue to be exposed to the rising sea-levels and intensifying cyclone events.

105. **Catalyzing additional coastal adaptation finance**: The scale of the proposed GCF project allows multifaceted barriers to be addressed in a comprehensive manner within a single project framework which past donor support has not been able to do. In particular, this project has an element of supporting Island Strategic Plans (ISPs) as an integral part of the project's sustainability and replication strategy for the results achieved. Due to the small economy, it is likely that the country will face fiscal constraints in using central government expenditures on expanding coastal protection beyond the GCF project at a sizable scale. However, outer islands have access to unconditional grants which are supposedly guided by ISPs. In conjunction with the capacity building activities envisaged under Output 1, especially those focusing on the application of EBA measures, it is expected that the GCF investment will become a conduit for leveraging island-level financing for future coastal protection activities that are within the realm of the technical skillsets and funding available to the community.

106. Without GCF involvement, it is likely that Tuvalu and its vulnerable citizens will continue to be exposed to increasing threats from tropical cyclones, king tides, and other wave overtopping events. At best, international support for constructing a robust coastal protection will come at a very slow speed. Yet, even then, it is probable that, because coastal protection is expensive, much of the resources would be dedicated to the construction itself, leaving out the possibility for building the country capacities and for sustainability. Eventually, left unaddressed, Tuvalu will become uninhabitable and push relocation to the forefront of a practical and cost-effective adaptation response. The loss and damage that will ensue at that time will be significant given the country's rich historical cultural heritage.

D.2. Exit Strategy

107. The proposed project has been designed through extensive consultations and involvement of government, NGOs, and CSOs to ensure ownership of the interventions and effectiveness of their impact. Relevant government departments and local communities have been involved in the proposed design and will be leading on implementation of project interventions. The project builds on this commitment and ownership to ensure that the investments and impacts are sustained for the long-term through the following:

108. **Selection of long-lived coastal protection measures with an ex-post Operation and Maintenance plan:** First, the selection of the coastal protection measures have been done so to achieve the minimum design life of 25 years for geo-textile revetment (in outer islands only); and with the appropriate selection of vandal resistant bags for the top layer walls, the life expectancy is expected to be considerably longer. For rock armour and pre-cast concrete revetments, the design life of 50 years will be adopted following the standards for normal maritime structures. This means that the coastal protection options that will be employed in the GCF project will not require a major structural overhaul during their product life.

109. However, for the minimal maintenance that may be required, such as the repair of wave return walls, monitoring of vandalism, visual observation of wear and tear, patrolling for preventing sand/gravel removal at the site or in adjacent sites, application of repair patches for geo-textile sand containers, planting and recovery of coastal vegetation, it is critical that there is secured sources of financing. To this end, the GoT has agreed to allocate approximately US$2.3 million for the duration of the project (or approximately US$128,713/year for 15 years) to be used for this purpose. This comes from the Infrastructure Maintenance Budget. In addition, additional measures are supported by the project including training of government staff and communities to ensure ownership and capacity for post-project monitoring and maintenance. (See O&M plan, Annex XIII)

110. **Developing outer island level conditions for exit strategy**: Due to the remoteness of outer islands from the capital, public service delivery has been one of major development challenges in Tuvalu. To sustain the adaptation results achieved through the GCF project, it becomes critical that roles and responsibilities between the central government and

island administration (*kaupule*) are clearly delineated and understood among all stakeholders. The proposed activities under Output 3 are geared towards strengthening the foundation for improved execution of public service delivery at the outer island level, the work currently supported by UNDP. This work will enhance the effective use of unconditional grants available at the outer island level towards general environmental conservation, climate change adaptation and maintenance of the GCF-financed infrastructure. Two sources of grants – Falekaupule Trust Fund (FTF) and Special Development Expenditure (SDE)[30] – currently have annual distributions of approximately US$39,000 and US$64,000 per island, respectively, and the GCF project will provide additional incentive through performance-based top-up grants. In partnership with the two UNDP-supported projects, GCF resources will be used to strengthen the capacity of administrations for participatory ISP formulation, raise awareness about coastal processes and ecosystem-based coastal protection approach, and transparent execution and monitoring of the grants. Through this support, it is expected that the periodic monitoring and maintenance needs, which do not require technical assistance from the central government, will be financed out of the FTF and SDE.

111. **Targeted capacity building at the central and outer island levels**: Support on the ISP process will be complemented by capacity building activities at two levels. At the outer island level, community groups, including youth and women's groups and other CSOs will receive technical training on multiple areas including the following:

- Collection of beach profile data by training 45 individuals in all the islands (at least half of them women)
- Execution of simple ecosystem-based coastal protection work such as coastal vegetation, ridge and dune restoration and the use of native trees to construct wave breaker structures and groynes
- Coastal protection maintenance work
- Monitoring and the basic repair of the geo-textile sand retainer revetment

112. Long-term monitoring of coastlines through beach profiling will enable the Government to respond more effectively, complemented by technical capacity building for implementing ecosystem-based coastal protection work. To assist timely and effective maintenance of geo-textile revetment, basic repair kits sufficient for 4-5 years will be procured and youth and women's groups will be trained for the application of the kit. After the project closure, the trained groups are expected to be employed by *kaupules* once such repair work needs arise and will be paid out of the FTF and/or SDE (which is the focus of Output 3 of the project). Not only will this approach contribute to building local capacities, it will also open a cash employment opportunity in outer islands which is currently highly limited.

113. At the central government level, technical officers at PWD and DoLS, will receive special trainings. DoLS officers will build capacity for collecting, synthesizing and analyzing beach profile data collected by community members as described above. This will enable them to obtain periodic information on coastal processes. PWD officers will be engaged during the design stage of coastal protection measures in Funafuti, Nanumea and Nanumaga, and they will gain hands-on experience in the maintenance of the system as well as implementation of EBA coastal protection work.

114. **Building a body of knowledge, facilitate learning**: It is important to emphasize that building climate resilient coastal protection structures is a new field in Tuvalu and many parts of the Pacific. Information and awareness gaps are still significant in the country in terms of coastal dynamics and locally appropriate solutions. Through monitoring of the effectiveness of the proposed GCF investments, awareness raising support, targeting all the islands, exchange visits (bringing island representatives from non-target islands), collection of beach profile data by communities and synthesis by DoLS, and organization of regional knowledge sharing events, the project builds national and regional knowledge on coastal processes and climate resilient coastal protection options. Moreover, in the final year of the project, a technical assessment will be carried out by an expert to review the effectiveness of the coastal protection measures put in place in the project.

115. This GCF project will become one of the first projects in the Pacific that deliver engineered coastal protection solutions in remote outer islands where landing facilities are non-existent and basic data are limited. The overall experience from the implementation of this project, therefore, will contribute tremendously to the national and regional

[30] SDE expenditures include other block grants

body of knowledge. Accumulation of such knowledge in turn becomes critical to effectively expand and maintain coastal protection works in the region.

E.1. Impact Potential

Potential of the project/programme to contribute to the achievement of the Fund's objectives and result areas

E.1.1. Mitigation / adaptation impact potential

116. The design of the proposed GCF project incorporates lessons and best practices from several other projects to bring about transformative impact that is effective, efficient and sustainable. These lessons include a) the use of locally-appropriate technologies based on information available that are expected to be most cost-effective; b) the effectiveness of comprehensive barrier removal strategy; c) an innovative approach for capacity development in the Tuvalu context; and d) the critical importance of leveraging available local resources for promoting longer-term autonomous adaptation. These lessons have been derived from experiences from the first LDCF-financed project in Tuvalu, and community-based adaptation initiatives in other SIDS from the region.

117. Comparable efforts in the region and elsewhere have shown effective impacts related to saving lives and protecting assets with an appropriate mix of hard and soft solutions that are locally suitable. For examples, in Australia, the Gold Coast Beach Protection Strategy included large-scale beach nourishment to widen sand starved beaches, dune rehabilitation efforts, and a large, submerged offshore reef together provided a buffer against future storm events and improved the habitat for marine flora and fauna (Jackson et al., 1997, Jackson et al., 2012). In Tonga, a combination of hard and soft measures including permeable gryones and beach nourishment will build the resilience of about 3,000 people in low-lying communities.[31]

118. The proposed GCF project will contribute to the achievement of climate-resilient sustainable development in Tuvalu. Construction of coastal protection measures in the most vulnerable coastlines of the country along high value zones will reduce the vulnerability of Tuvaluans to future impact of climate change including tropical cyclones and heightened wave actions that have caused significant damages to lives, livelihoods and economic assets in the past. The proposed measures will enable communities living in the vicinity to not have to bear the brunt of unabated coastal inundation and damages. This will ensure that businesses/livelihoods face lower disruptions, communities themselves do not incur the heavy economic losses, not to mention the cost of disruptions to people through forced relocations. 2,210m of vulnerable coastlines will be protected by coastal defenses to minimize risks from wave over-topping events. Moreover, if large scale wave over-topping events occur which result in a national state of emergency, the support structure for community-based disaster early response and recovery will help the affected restore their livelihoods and other economic assets as soon as possible. Overall, the project will contribute to Fund level impact of increased resilience of infrastructure and the built environment to climate change.

a. The project will benefit about 3,100 people directly and about 3,499 indirect beneficiaries. This is about 62% of the population of Tuvalu.
b. The project can potentially reduce annual losses (including statistical value of life) worth up to up to $667,000 over 40-year time period (period of analysis for the economic analysis)

119. The project outcome will strengthen the adaptive capacity and reduce exposure to climate risks through strengthening of institutions, human resources, awareness and knowledge for resilient coastal management, protection of vulnerable coasts in high-value asset areas, and establishment of a sustainable financing mechanism for long-term adaptation efforts. *The project will establish at least 3 coastal defence measures along vulnerable coastal lines in three target islands.*

120. The project will result in strengthened institutions, human resources, awareness and knowledge for resilient coastal management. Local capacities will be enhanced through on-the-job training and experience building in monitoring and data collection of very dynamic coastal processes and design of coastal adaptation measures. The project will build and improve technical capacity of nationals to lead and take ownership in further development, implementation, and sustenance of coastal protection measures through the project, as well in the future. It will also Increase knowledge of targeted government officials and community members including women, youth and children, in order to broaden the awareness on the impacts of climate change on coastal vulnerability. *The project will enhance the technical capacity of at*

[31] http://www.pacificclimatechange.net/components/com_booklibrary/ebooks/Tonga%20factsheet%20final.pdf

least 12 government staff and support at least 24 students to obtain professional opportunities related to climate change adaptation.

121. The project will reduce exposure of vulnerable populations to climate risks by reducing the vulnerability of key coastal infrastructure including homes, schools, hospitals, and other assets to wave over-topping events (See Annex X showing assets to be protected). It will support participatory design, implementation, and monitoring of coastal measures in Funafuti, Nanumeae, and Nanumaga. *The project will result in reduced vulnerability of coastal assets along 2,210 m of high-value coast lines in the three target islands.*

122. The project will establish a sustainable financing mechanism for long-term adaptation efforts so that adaptation actions are financed and implemented through island level plans. It will empower community members, including men, women, youth, children, and the elderly to participate in a climate resilient planning process of the ISPs, taking into consideration climate change impacts and integrated coastal, land, and marine resource management principles. It will also result in enhanced capacities of communities to monitor, evaluate and communicate results and impacts of coastal protection adaptation investments. *The project will support financing and execution of at least 16 adaptation priority actions (two each in 8 of the country's islands), outlined in ISPs.*

E.1.2. Key impact potential indicator

Provide specific numerical values for the indicators below.

GCF core indicators	*Expected tonnes of carbon dioxide equivalent (t CO_2 eq) to be reduced or avoided (Mitigation only)*	*Annual*	N/A
		Lifetime	N/A
	• *Expected total number of direct and indirect beneficiaries, disaggregated by gender (reduced vulnerability or increased resilience);* • *Number of beneficiaries relative to total population, disaggregated by gender (adaptation only)*	*Total*	Approximately 3,100 direct beneficiaries 3,499 indirect beneficiaries
		Percentage (%)	29% of total population (direct); 62% of total population (direct and indirect)

123. For estimating the total number of beneficiaries who will be under coastal protection through the GCF investments, in Funafuti, a series of maps produced for Funafuti during an UNDP-supported LDCF project were used. These include a detailed contour map showing the present elevation of the island and two maps showing potential inundation areas under sea-level rise (SLR+10cm and +50cm) (See Annex IX for detailed maps). These maps demonstrate that the areas in Funafuti where houses and other buildings are most concentrated are on highest elevation of the island on the beach ridge (approximately between 2.6-3.0m). However, these maps, as well as the terrain profile of Fongafale (the main island of the Funafuti atoll)[32], confirm that almost the entire island of Funafuti is at risk from coastal inundation especially under the combination of the following factors: projected sea-level rise of 4-14cm by 2030 under a high emission scenario; the king tide season of January-March; the tropical cyclone season of November-April; and compounding impact of warm water on sea-level. Based on this, all the households to the landward side of the proposed intervention area to the airstrip were counted and included as the direct beneficiaries.

124. For all outer islands, including the two targeted islands in this project, detailed inundation maps do not exist. For this reason, an aerial photograph was used to simply estimate the number of direct beneficiaries.

125. The total number of indirect beneficiaries include all of the households in the target islands. Due to the small economy, it is assumed that once a large scale wave overtopping or inundation event takes place, the entire economy of the island will be severely affected. Overall, the project will directly benefit 1,569 women and 1,531 men in the targeted islands.

[32] Yamano, H., Kayanne, H., Yamaguchi, T., Kuwahara, Y., Yokoki, H., Shimazaki, H., and Chikamori, M. (2007). Atoll island vulnerability to flooding and inundation revealed by historical reconstruction: Fongafale Islet, Funafuti Atoll, Tuvalu. Global Planet. Change. 57, 407–416.

Comparison of project indicator values with similar projects

126. One project that is similar, in a comparable context, is the "Trialing coastal protection measures in eastern Tongatapu" project in Tonga, supported by European Union and SPC. This project aimed to trial coastal protection measures (both soft and hard measures) in two pilot sites of eastern Tongatapu stretching 900m and 390m. In this project, reflecting that this was a pilot project, the project objective indicator is set as "Level of awareness about climate change adaptation and coastal management raised by 10% of population in Tongatapu". This Objective is supported by four Key Result Areas (KRAs) related to 1) awareness; 2) coastal adaptation investments; 3) monitoring of effectiveness; and 4) capacity for planning for coastal change. The set of indicators for this project is in fact similar to the proposed GCF project, which is an indication that SIDS in the Pacific region are facing similar set of constraints/barriers.

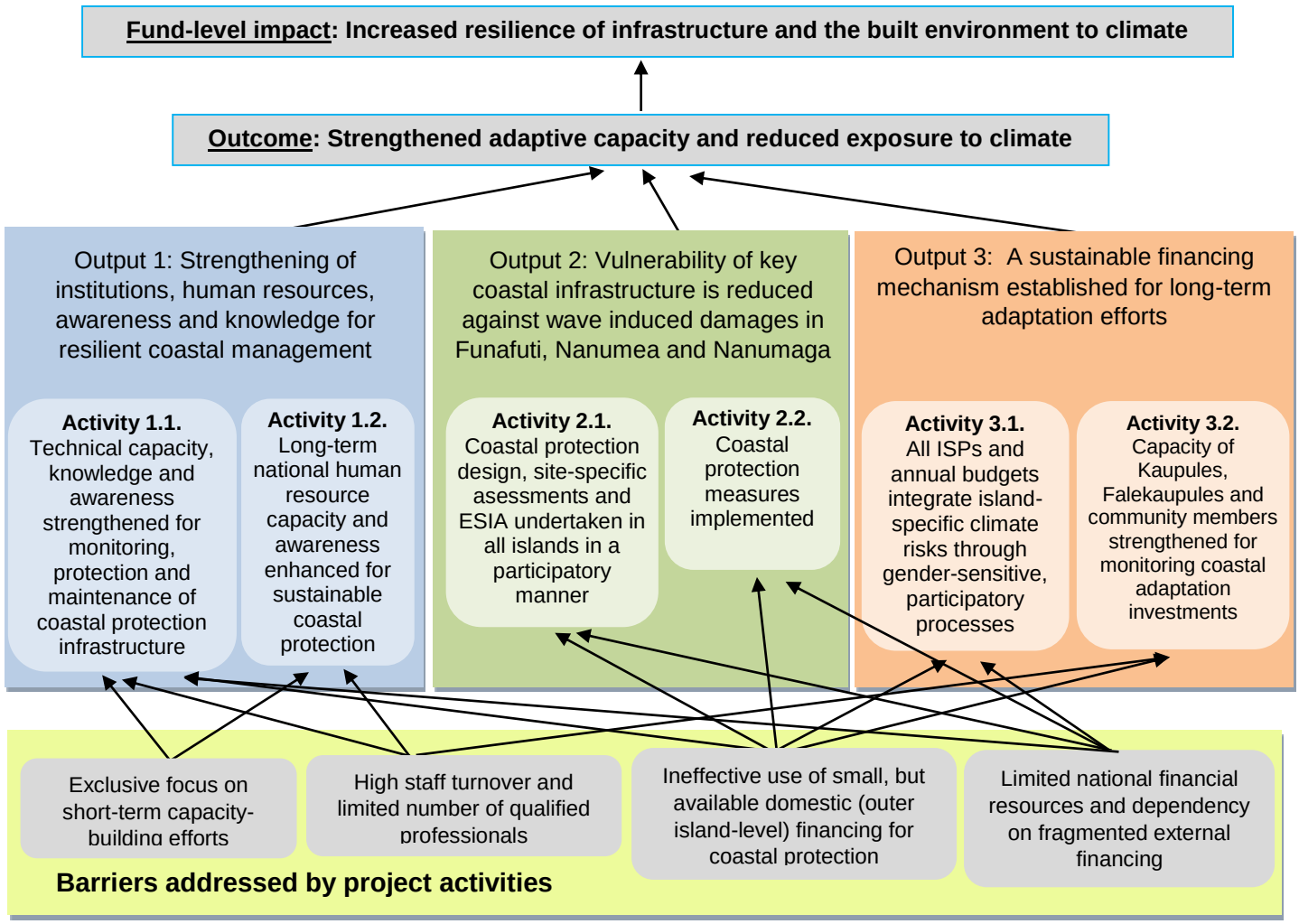
127. The Tonga project design document also states that the project aimed to "move from a piecemeal approach to a more comprehensive framework by looking at an entire geomorphological section of coastline and understanding the process and coastal dynamics[33]." The project was also an attempt to demonstrate effectiveness of alternative approaches, such as permeable submerged groynes and beach nourishment, to a solid seawall solution so that local communities can see and learn about these new approaches. These considerations are also common with the proposed GCF project. The target number of beneficiaries for this project is approximately 3,000. Similar coastal protection work was undertaken in the Tonga *Strategic Program for Climate Resilience* funded by the Climate Investment Fund and implemented by the Asian Development Bank. Preliminary results indicate that the project has resulted in significant improvements to the coast with respect to reduced erosion and inundation.

[33] P.31 Project Design Document: http://www.pacificclimatechange.net/components/com_booklibrary/ebooks/2.%20Tonga%20PDD.pdf

E.2. Paradigm Shift Potential

Degree to which the proposed activity can catalyze impact beyond a one-off project/programme investment

E.2.1. Potential for scaling up and replication (Provide a numerical multiple and supporting rationale)



128. The proposed project has three inter-related Outputs that not only aim to achieve impact potential as described above, but also to create enabling conditions for scaling up and replicating the project impact beyond the immediate target areas. Each of these Outputs comprises a set of activities, which in turn have been designed to remove specific barriers that impede the achievement of the climate change vulnerability reduction objective. *The theory of change* for this project described below demonstrates how the implementation of project activities lead to short-term outputs of the project. These outputs lead to longer-term outcomes which include reduced vulnerability of Tuvalu to future impact of climate change, reduced loss from potential natural disasters, enhanced livelihoods and food and water security. All of these outcomes contribute to strengthening climate-resilient sustainable development of the country.

129. Output 1 of the project will improve the enabling environment for reducing coastal vulnerability in the country. To achieve this output, two activities will be implemented including technical capacity building within the government departments whose mandate includes the protection and monitoring of coastal areas, engagement of youth in coastal protection technical trainings with the intention to build long-term national capacity for resilient coastal management. It is important to emphasize that this Output also includes technical capacity building for EBA coastal protection options that are within the technical and financial capability of implementation for the central or outer-island governments (see more below under Output 3). One of the outcomes that emerges from the achievement of this output is that the technical

departments possess a sufficient level of technical expertise to monitor and assess high risk coastlines and possible causes of climate and/or non-climate risks and identify practical coastal protection solutions. Another outcome is continuous engagement of youth and women over time in coastal protection work. This includes both community-level monitoring of the effectiveness of the GCF investments as well as simple repairs that may be needed. Improved knowledge about and data on dynamic coastal formation process is also an expected outcome, including the availability of coastal inundation models. None of these conditions currently exists in the country, resulting in reactive, piecemeal, myopic investments in coastal protection. Leveraging improved skills and knowledge of youth and women, the project will generate income earning opportunities for these groups, which will contribute to their empowerment in society. As discussed below, Output 3 improves island-level financing mechanisms for adaptation actions through improvement of an adaptation planning and budgeting process and strengthening of iterative monitoring of adaptation actions. However, the outcomes expected from Output 3 would not be sustained unless Output 1 leads to the outcomes illustrated above.

130. Output 2 will seek to reduce coastal vulnerability of Tuvalu to climate change induced hazards. Underlying activities include detailed island-level assessments to finalize the coastal design, which also contributes to enhancing the currently limited body of knowledge about coastal dynamics and island formation process in the country. While the proposed GCF project will put in place coastal protection measures in three islands, the assessments will be carried out in all the islands of the country. As described in the barrier section, detailed data on coastal conditions are simply not available because of the costs involved in this type of assessment. The lack of data on coastal conditions, in turn, affect the GoT's ability to attract international financing for vulnerability reduction investments. Thus, this Output is expected to equip the country with a prerequisite often required by donors for funding. The process of the assessments, design and construction will provide opportunities for technical department staff to obtain hands-on skills and procedures for replicating the GCF investments beyond the project lifecycle. Removal of coastal vulnerability is a prerequisite for a small island nation of Tuvalu to attain the outcomes of resilient livelihood options, reduced economic loss and damage from sea-level rise and coastal inundation events, and protection of the highly vulnerable groundwater resources.

131. Output 3 will strengthen a sustainable domestic financial mechanism to sustain, replicate and scale GCF investments. This output will be supported through two activities: First is technical assistance for reflecting climate change adaptation concerns into the Island Strategic Plans (ISPs) and their budgets; and second is improving the iterative planning and budgeting process through proper monitoring (and reflection of the outcomes from the continuous monitoring in the next ISPs in the following year). As discussed earlier, ISPs present an opportunity for all groups of the community, including women, youth and other vulnerable groups, to express their different climate change concerns in the design of the ISP. On the other hand, disbursements of Falakaupule Trust Fund (FTF) and Special Development Expenditures (SDEs) represent the primary sources of unconditional development grants to support the implementation of island priority actions. The improved use of ISPs as guidance for the effective use of FTF and SDEs, as well as transparent monitoring and verification of the performance of the ISP implementation, will catalyze a greater impact potential from sub-components 1 and 2. In other words, without Output 3 activities, the expected impact from the other two Outputs is unlikely to be sustained as the maintenance needs and/or replication/up-scaling needs would have to be financed by another foreign aid. Moreover, technical capacities for coastal protection obtained within relevant government institutions would not be immediately put to use. The expected result from this output will help leverage the current annual distributions of approximately US$39,000 and US$64,000 per island for FTF and SEDs, respectively, for the achievement of climate resilient development in the country. The implementation of EBA coastal protection measures, such as coastal vegetation, storm ridge and dune restoration, and small-scale beach nourishment, is the type of investments that could potentially be supported using the island-level development budget and leveraging the capacity building exercises specifically focusing on these techniques (under Output 1). GCF investments along 2,210m of vulnerable coastlines, out of the 21,300m of total vulnerable coastlines in the country, means that the potential for scale up, in theory, is about nine times the length of the coastlines targeted in the project (after taking into considerations the baseline of 570m of existing coastal protection measures financed by JICA and UNDP/LDCF/GoT).

132. GCF resources will also be used to enhance the Government's capacity for early response and recovery when the country is struck by a natural disaster. This will be done by making GCF resources available to cover the procurement costs of urgent response and recovery needs. Due to severe limitation in available national budgets, the country is often dependent upon international assistance when they embark on early response and recovery from natural disasters, limiting the speed and flexibility in their response. Recognizing that no coastal defense is capable of eliminating the future damage

from intensifying cyclones and other wave overtopping events, it is extremely important that the capacity for early recovery is also strengthened.

133. Lastly, the knowledge accumulation and lessons sharing activity under Output 1 is expected to extend the project's replication potential beyond Tuvalu. Many Pacific SIDS face similar constraints in terms of accessing the needed finance for their coastal protection requirements and obtaining the needed data on coastal dynamics to even plan for such investments. Tuvalu's experience in a comprehensive barrier removal approach through GCF support will be shared in regional fora and other information outlets.

E.2.2. Potential for knowledge and learning

134. Support for facilitating learning and building knowledge including for generation, dissemination and use, is envisaged in four areas of project activities. The first will target government officials from DLS, PWD and DoE who will receive trainings on synthesis and analysis of beach profile data, coastal protection feasibility assessments, basic maintenance of coastal protection infrastructure, and ecosystem-based coastal protection approaches. This will not only involve the in-class type of pedagogy, but also outposted-assignments in institutions such as UNDP, SPREP and SPC Geoscience Division as well as hands-on trainings during the actual execution of Output 2 activities. CCPU will also be exposed to various learning opportunities as an entity responsible for coordinating and overseeing climate change initiatives in the country. In total, at least 12 officers are expected to be trained.

135. The second area targets students who are currently in a high school or university program so that they will obtain a higher degree in disciplines related to coastal protection such as civic/coastal engineering and oceanography. This programme will be supported only in the first 4 years of the project implementation so that, during the lifecycle of the GCF project, the students supported will have graduated and, as per the scholarship arrangement, come back to Tuvalu to work on the project to apply their knowledge and skills gained. The university partnership will also allow learning and knowledge-generation to be disseminated within and beyond Tuvalu, where academics and students will be invited to conduct research and or field-based studies. Not only will this allow young academics and experts in Tuvalu and in the region to interact with global experts in the field, but also, the knowledge and learning from Tuvalu regarding coastal resilience building can then be shared throughout the world.

136. The third area of knowledge sharing and learning will take place in the communities targeting both the administrators (the *Kaupules* and the *Falekaupules*) and community members. The administrators will gain better understanding about the process for participatory, gender-responsive development planning, budgeting and execution while community members will enhance their awareness about the importance of independent monitoring of the performance of the administrators, judged against the ISP. Officers from the Department of Rural Development will also enhance their knowledge of facilitating community dialogue for development planning as an independent facilitator of the process. In addition, this development dialogue platform will also be used to improve learning among community members about climate risks, the notion of island formulation process and the ecosystem-based adaptation approaches, data collection for coastal monitoring, coastal design options, maintenance responsibilities, and costs. This provides an important opportunity to make their own decisions regarding their future. Training of trainers approach will also be used, as this will be an effective, efficient, and sustainable way to reach out, train, and empower a large number of beneficiaries that are located in remote atolls.

137. Lastly, the overall experience in project implementation and results from monitoring of the impact of the investments on vulnerability reduction (gauged in terms of wave overtopping events or sediment transport at the island level) will be shared at regional/international fora. The empirical evidence of the impact of climate resilient coastal protection is limited in the Pacific, especially from SIDS. Lessons learned and best practices will be proactively shared and the project will make direct contributions towards the buildup of the regional body of knowledge in coastal protection, a development priority shared by many other SIDS in the region. The project will also support sharing of lessons learned and best practices through the continuous monitoring and evaluation of the project. The M&E plan (Section H.2) will include provision for generation of lessons learned and best practices (reports, publications, and other communication and knowledge products for various media) to not only support adaptive project management but also to inform learning across national/sub-national/community levels within the country and the region.

E.2.3. Contribution to the creation of an enabling environment

138. The project will build on a baseline scenario that is currently shaping the way development activities are carried out in Tuvalu. As described previously, the Falekaupule Act gave rise to the establishment of island administrations and FTF, which in theory, marked the beginning of a new development paradigm - one that tipped the scale of local governance in favor of local community and popularly elected island administration from the hitherto central government-driven approach to island development. UNDP's Support to Local Governance project was instrumental in responding to this aspiration of the Government by introducing the concept of ISP with the intention to better govern the way in which FTF distributions are used and to effectively encourage women and youth in the decision making process, groups that had previously been excluded in the process. Nonetheless, the principle of effective local governance is only slowly taking root in the society, and continuous assistance is currently being provided to integrate climate change adaptation and NRM concerns into ISPs and finance the priority actions through FTF/SDE. It is in this context that the proposed GCF project is designed, especially activities in Output 1 and Output 3.

139. This general trend introduces a development model in which central technical agencies become a service provider while the island community plays a more central role in deciding what development support they need from the capital and executing some development activities if they are within the realm of the skillsets available at the island level and financial constraints imposed by FTF/SDE. Capacity building activities under Output 1 and support on a sustainable financing mechanism under Output 3 respond to this general principle of differentiated roles and responsibilities between the capital and outer islands and promote a paradigm shift towards participatory and climate-risk informed development. Technical capacities of CCPU, PWD, DoLS and DoE will be strengthened in the areas of coastal design, assessments and monitoring, and overall coordination, as these functions cannot be carried out by outer island administrations. At the same time, there will be another set of capacity building activities specifically focusing on EBA coastal protection options. PWD and NGOs will be exposed to more technical aspects of the EBA approaches; and, community members will be exposed to a series of awareness raising events about them. Output 3, will contribute to an enabling environment in which such coastal protection measures are expected to be discussed and financed through ISPs in a participatory process. This process will be a critical condition for promoting effective and sustained participation of the public sector in resilient development.

140. It should also be noted that the improved mechanism to channel unconditional island-level budget (FTF/SDEs) for resilience building activities is an innovative approach in the context of the Pacific region. Aid dependence in Tuvalu is high and the successful application of this approach means a fundamental shift in the ways community-level development activities are financed to supplement centrally driven development assistance.

141. The construction and maintenance of coastal defense in Tuvalu is the responsibility of the public sector as it does not offer any revenue generating potentials. Thus, this project does not envisage the participation of private entities, although businesses are a key of the beneficiary of the project.

E.2.4. Contribution to regulatory framework and policies

142. ***National Climate change policies:*** The proposed project is in line with and contributes to the operationalization of GoT's key strategies and policies including the Te Kakeega II, which recognizes that climate change poses significant threats to the achievement of the national development goals and Te Kaniva, the Tuvalu Climate Change Policy, which, with its vision *"To protect Tuvalu's status as a nation and its cultural identity and to build its capacity to ensure a safe, resilient and prosperous future"*, guides the country's efforts in both adaptation and mitigation. Accordingly, a key design principle that underlies this project is this commitment of the Government expressed in Te Kaniva – protecting the nation's sovereignty. The project supports the implementation of the priorities laid down in the Tuvalu National Adaptation Programme of Action (NAPA) and the National Strategic Action Plan for Climate Change and Disaster Risk Management (NSAP).

143. ***Environmental Protection Regulations 2007/2014 (Section 8):*** The project targets the DoE as a recipient of capacity building support on ESIA oversight. This will be done not through a class room based training, but through direct engagement of an ESIA officer in the actual ESIA process carried out by a contractor procured in the project. This will provide an opportunity for the officer to gain hands on experience in the ESIA process, which will be valuable in conducting his/her role.

144. ***Island Strategic Plans (ISPs):*** The project will strengthen local and national capacities for evidence-based Island Strategic Planning and implementation. The island-level assessments that will be conducted in all the islands of in Output 2 will generate scientific, historical social, economic and environmental information through technical and participatory processes, which can be used for participatory island level planning and budgeting.

145. **National Youth Policy (2015) and Gender Policy (2013):** Tuvalu recently launched its national youth policy (August 2015) which underpins youth engagement in decision making. The Gender Policy focuses on five key policy measures of institutional strengthening, capacity building, economic empowerment, decision-making, and ending violence against women. The ISP support under Output 3 as well as targeted youth/women engagement in capacity building and local employment created in the project will contribute to the achievement of the policy objectives of these two policies.

E.3. Sustainable Development Potential

Wider benefits and priorities

E.3.1. Environmental, social and economic co-benefits, including gender-sensitive development impact

146. Investments in coastal protection along the vulnerable, high-value coastlines are expected to generate environmental, social and economic co-benefits, including benefits that are specifically enjoyed by women.

Economic benefits

147. The most unambiguous economic benefits from the proposed project is avoided economic losses from coastal inundation events caused by storm surges. An economic analysis conducted for this project reveals that it can potentially reduce annual losses (including statistical value of life) worth up to up to $667,000 over 40-year time period (See Section F.1 and Annex XII). These economic benefits are derived from the protection that coastal defense will offer for the following key economic or social infrastructure in the islands of Tuvalu.

- **Funafuti**: Homes to 2,174 individuals; the Government building; national radio station and radio tower; power generation facility; national bank; hospital; schools; churches; kaupule office; hotel and shops.
- **Nanumea**: Pre-school and primary school; clinic; bank; radio station; police station; vegetable gardens; kaupule office; falekaupule office; telecom center; women's handicraft center; bank; police post; cemetery.
- **Nanumaga**: Primary school; hospital; church; cooperative store; jetty; kaupule office; community hall.

148. In addition, this project will create short- and medium-term job opportunities for local labour force, especially youth and women. To strengthen the community-level data collection process for real-time monitoring of coastal dynamics, youth and women will be trained and paid to collect beach profile data. During the lifecycle of the project, their services will be compensated through the project budget. After the project, it is envisaged that island development budgets will be used.

36 jobs (4 per island)[34] are expected to be created for this work. In addition, in selecting a list of relevant coastal protection options, the potential for local employment creation was also considered. In particular, geo-textile and pre-cast concrete revetment solutions are thought to contain some labour content during the construction process. It is estimated that 60 short-term jobs will be created during the construction of coastal protection measures. After the construction, maintenance needs are expected to be fulfilled by local labour (financed by island administration). It is expected that six individuals for each of the three targeted islands will be trained for this purpose. In total, the project is expected to create 102 short- and medium-term jobs. This will provide formal employment and cash-income opportunities for low skilled/vulnerable people and have a substantial impact on the unemployment rate of Tuvalu that currently is around 8.9% in Funafuti and 4.6% in outer islands. (Government of Tuvalu, 2012). The selection of the individuals for carrying out these tasks will be based on self-selection, but youth and women's groups will be given a priority with a target of 50-50 gender balance.

149. Given the lack of disaster insurances and other financial instruments that can provide resources to recover from disasters in Tuvalu, the government and external donors in general cover most of the recovery costs from natural disasters. By reducing the amount damages to infrastructures and private assets, the proposed project will provide substantial savings for the government that could use their resources for longer term adaptation strategies and/or other pressing needs (e.g. education, fuel costs etc).

150. In addition, the proposed project will assist fast recovery from large-scale extreme events. This is based on a realistic recognition that no coastal protection measures are capable of reducing potential damages from wave overtopping or storm surge events zero, especially in the face of worsening climate change impacts. The fund is expected to move the national/local economy back on track as soon as possible so that economic disruptions from such disaster events are kept minimum.

Environmental benefits

151. The proposed coastal protection structure will also generate co-benefits of coastal erosion prevention, especially when ecosystem-adaptation measures such as ridge restoration and coastal vegetation are implemented in the adjacent areas of the hard structure. Severe erosion is often observed after strong tropical cyclones causing losses of valuable natural resource assets for a country with 26km^2 of landmass.

152. Wave overtopping events and subsequent waterlogging can be a cause of saline water intrusion into the fragile groundwater resources in islands where groundwater is still used for drinking purposes or aggravate bacterial contamination by accelerating seepage from septic tanks and livestock pens. Many makeshift seawalls that have been privately built have collapsed due to the constant wave energy along the coasts of Tuvalu, especially in the main island of Tuvalu. Because of collapsed seawalls, the foreshore is turned rough, unsafe and access to sea has been limited. Coastal protection measures that are appropriately designed and constructed are expected to ameliorate these environmental problems.

153. The project will also create habitat for marine fauna. The three dimension structure of the sea walls provides an ideal habitat and this will have flow on effects through the trophic system, therefore increasing the number of higher order animals such as fish. These fish can then potentially be caught by Tuvaluans therefore providing an additional source of food.

Social benefits

154. The proposed project will also generate a range of social benefits which will positively affect the overall well-being of the Tuvaluan citizens. First, a robust coastal protection and awareness about locally appropriate interventions bring the perception of safety. Reduced disruptions of economic and agricultural activities, education, public and medical services, and cultural activities are directly linked to the level of resilience in society. Incidents of coastal inundation and waterlogging have direct impact on public health through the increased incidents of water borne diseases and overstretching the highly limited public health facilities in the country. GCF resources will contribute to the realization of these social benefits through the reduction of the number and magnitude of wave overtopping events.

[34] It is expected that 45 individuals will be trained for this purpose. However, 9 of them are existing Land Clerk who are employed by the Government. So in terms of new job creation in the project, it is 36 jobs.

155. The capacity building strategy adopted in the project is likely to have additional social benefits. The long-term capacity building approach, by targeting not only those currently in the government system but also future generations, will address inherent development challenges of the country. Due to the size of the country, attracting skilled individuals into the country or government system is a continuous difficulty. The project will contribute, through a targeted scholarship program, to long-term capacity development, socio-economic empowerment and well-being of the country.

156. Impact on women's and youth's empowerment expected in this project should not be undervalued. Through the support from Output 3, ways in which women are involved in the island decision making process are going to be altered systematically. In addition to being invited as an integral interest group of the society into the decision making process, women's group will be responsible for monitoring the performance of the *kaupule*. The project has a dedicated indicator to monitor progress in this regard. Also, as described above, the project consciously reflected in its design the challenge of the limited economic opportunities in outer islands, especially for women and youth, by creating job opportunities through the implementation of the project. Given the strong correlation in general between economic well-being and empowerment of individuals, the social benefits derived from the new employment opportunities in the project are expected to be large.

157. Lastly, it should be acknowledged that the implications of protecting the low-lying islands of Tuvalu from encroaching impact of sea-level rise and erosion go well beyond what can be possibly be captured in the range of social benefits such as education, health, or even safety. The project strives to support Tuvalu's key vision to protect its status as a nation and its cultural heritage by preventing, or significantly delaying, the scenario of Tuvaluan islands becoming uninhabitable. The project advances and supports the sovereignty of Tuvaluans. Through this, it assures intangible benefits to the people of Tuvalu including the sense of dignity people derive from living in a country or culture to which they belong and the sense of self-fulfillment people derive from the ability to make decisions about their own future.

158. Furthermore, the proposed GCF project would alleviate the sense of inequity that is inherent in climate change impacts – inequity that originates from the cruel reality that a country that has contributed so little to the current concentration of carbon dioxide in the atmosphere is forced to bear the brunt of the impact of climate change.

Gender-responsive development impact

159. The project is expected to bring a range of gender-responsive development impacts. First, women along with youth will receive targeted training on monitoring of coastal change, basic maintenance of coastal infrastructure, and implantation of ecosystem-based solutions to coastal protection (Output 1). Not only will enhanced skillsets contribute to general empowerment of women, but this will directly be linked with increasing employment opportunities. Because the project will generate both demand for such services by the island administrations (*kaupule*) (through Output 3 activities using available island-level unconditional grants) and supply (skilled labour for maintaining and expanding coastal protection), it is likely that the impact will be long-lasting.

160. In addition, women's group members will be trained in participatory video production, which will be a tool to monitor the transparent and effective use of island-level development finance by *kaupules* in accordance with the Island Strategic Plan. Such a responsibility, which is recognized by community members and *kaupules*, is likely to have impact on general empowerment of women.

161. There are also other indirect benefits that women will receive from the project interventions. According to UNWomen (2015), women account for 78% of the population involved in informal subsistence economy, most importantly agriculture. The agriculture sector is currently extremely vulnerable to cyclones, king tides and other threats coming from the ocean. During TC Pam, for example, up to 90% of the crops were affected in Nui and Nukufetau (OCHA, 2015). By reducing coastal vulnerability, and reducing the potential impact of wave actions on agricultural activities, the viability of women's livelihoods is expected to be maintained even under a changing climate. This assertion will be explicitly verified through a technical review that will be conducted at the end of the project implementation and it is included as one of the project indicators presented in Section H.

E.4. Needs of the Recipient

Vulnerability and financing needs of the beneficiary country and population

E.4.1. Vulnerability of country and beneficiary groups (Adaptation only)

162. Despite the minimal contributions to global greenhouse gas emissions, Tuvalu is disproportionately burdened with the significant impacts from climate change risks. The root cause of this adverse condition is its high exposure and vulnerability to climate hazards, combined with limited adaptive capacity. A number of environmental, economic, and socio-political factors contribute to its vulnerabilities, and leads to increased risks of climate change impacts in Tuvalu.

163. ***Small and low-lying islands***: The geophysical features of the islands, characterized by their small land area with low elevation, make Tuvalu particularly vulnerable to climate change impacts including sea level rise and coastal erosion. Tuvalu consists of nine islands with the total national land areas combined adding up to 26km^2, which makes Tuvalu the 4th smallest country in the world[35]. The country's maximum elevation is 4.6 meters above mean sea level[36], observed on Niulakita Island, and the other islands are substantially lower. The small and low-lying land area limits the physical space and natural resources required for economic development and climate change adaptation.

164. ***High coastal length ratio****:* The length of coastline relative to the landmass of the country has been acknowledged as an effective measurement tool for assessing the country's vulnerability as well as adaptive capacity[37]. Tuvalu is among the countries that have highest ratio in the world (10th longest according to the World Factbook). Further, the feasibility and implications of adaptation is least understood for SIDS and large deltas that typically have a high coastal length ratio[38].

165. ***Geographic and economic isolation***: The nine islands of Tuvalu are dispersed with the entire island chain extending across 700 kilometers of ocean. The physical distance, combined with a limited number of vessels, high fuel costs, and unstable communication networks make the exchange of people, goods, and information between these islands extremely challenging. In addition, the small domestic market provides limited potential to achieve economies of scale. With the exception of Funafuti, the outer islands rely heavily on limited natural resources for their livelihoods, with the majority of population, especially in the outer islands, involved in subsistence fishing and agriculture.

166. ***Narrow economic base***: Although incidents of absolute poverty is low in Tuvalu with a GNI per capita at $5,260, many experience economic hardships, where they do not have sufficient opportunities to access financial resources to cover basic needs such as medical and education expenditures[39]. This is due to the high economic cost of smallness of the country. The national revenue base is heavily influenced by the fluctuations of the global economy. Lack of jobs and opportunities compel youth in the outer islands to migrate to Funafuti[40], only to face even more hardships, as they often do not have access to land to produce food, water, electricity, sanitation, waste management, or adequate housing.

167. Over and above the baseline development challenges, climate change impacts are putting additional strains on Tuvalu's efforts towards attaining sustainable development. Available climate change projections suggest that Tuvalu will face rising sea-levels higher than the global average and less frequent but more intense tropical cyclone events. These two projections would pose a significant threat to the country where average elevation is barely above 4m and damages from wave overtopping are already reported during king tides and tropical cyclones.

168. Despite the level of exposure and vulnerability of the country with vulnerable coasts extending for about 8km, the country currently does not have a single coastal protection structure that withstands the future combined impact of sea-level rise and intensifying cyclones (except for two structures that are currently under design for 570m of the coastlines). Once extreme events strike, as seen during Cyclone Pam, the country faces considerable setbacks in terms of economic

[35] UN Statistics Division. (2006). Demographic Yearbook—Table 3: Population by sex, rate of population increase, surface area and density. http://unstats.un.org/unsd/demographic/products/dyb/dyb2006/Table03.pdf
[36] Lewis, J. (1989). Sea level rise: some implications for Tuvalu. Environmentalist, 9(4), 269–275.
[37] See, for example, IPCC CZMS 1992. Global climate change and the rising challenge of the sea. Report of the Coastal Zone Management Subgroup, Response Strategies Working Group of the Intergovernmental Panel on Climate Change, Ministry of Transport, Public Works and Water Management, The Hague, The Netherlands.
[38] IPCC, 1992; Bijlsma L Coastal zones and small islands. In Impacts, adaptations and mitigation of climate change: scientific–technical analyses Watson R.T, Zinyowera M.C, Moss R.H 1996pp. 289–324. Eds. Cambridge, UK:Cambridge University Press.
[39] According to MDG Progress report, nearly 20% of Tuvaluans made less thanUS$1 per day in 2010. However, this universal indicator does not capture definition of poverty in Tuvalu. In fact, there are no known cases of deaths as a result of starvation or proof that there are beggars in Tuvalu. Instead, hardship or 'poverty of opportunity' is experienced by many people in Tuvalu. Source: UNDP. (2011). Tuvalu MDG Report.
[40] Urban population in Tuvalu is estimated at 47%, with annual growth rate of 1.4%. Source: SPC. (2014). Population Datasheet. http://www.spc.int/sdd/index.php/en/downloads/doc_download/736-population-datasheet-jan-2014

growth, livelihoods and general well-being of the citizens. Due to the smallness of the country, a single shock can have a cascading effect in various sectors; and, due to the remoteness of the country, disaster recovery is slow and costly.

E.4.2. Financial, economic, social and institutional needs

169. According to the United Nations classification, Tuvalu has been classified as a Least Developed Country for the last 29 years. This is primarily because of the size of the economy including population, and geographic remoteness[41], factors that are closely linked with a nation's adaptive capacity. These have a significant bearing on the country's human development status. The causes of poverty and vulnerability are reported to include limited access to quality basic services and infrastructure and limited income generation opportunities particularly for women and youth with low qualifications. These are areas that can be exacerbated by the impact of climate change and that are of direct relevance for the focus of the proposed project.

170. Unstable macroeconomic conditions are an important factor affecting the ability of the Government to effectively respond to climate change threats. The economy of Tuvalu, and in particular government revenues, relies significantly on foreign aid, accounting for 51% of GDP in 2014, and potentially upwards of 55% in 2015. In addition, extra budgetary grants accounted for 21-32% of GDP during 2010-2015. Fishing license fees from foreign fishing vessels also account for a large part of government revenues, but fluctuates greatly between 15-45% over the same time period. As described earlier, Tuvalu's public debt had reached 41% of GDP by the end of 2013, with external debt accounting for 35% of GDP. The debt is expected to have risen to 56.9% in 2014 due to a recent loan agreement on a fishing joint venture. These macroeconomic statistics indicate that making planned, medium- to long-term public investments is extremely difficult for the GoT.

171. The private sector, in turn, is underdeveloped. Like many other SIDS, the public sector is the biggest source of employment (39% and additional 30% work in the public sector and semi-public sector or public corporations, respectively[42]), and the private sector accounts for only 28% of work force and 25% of GDP. For these reasons, the Government has historically relied on donor project financing to advance its development agenda. However, it is characterized by a similar set of challenges such as volatility and fragmentation of investments, as epitomized by the fact that the first climate resilient coastal protection support is being designed only now along the two stretches of coastlines in the country.

172. Weak institutional capacity is an additional factor contributing to the difficulty of the GoT in accessing the needed financial resources to build climate resilience, especially in the coastal areas. The GoT currently does not have the technical capacity to carry out detailed feasibility assessments for coastal protection design and thus its ability becomes further limited to seek donor assistance. Furthermore, the assessments typically needed for building coastal defense are highly technical and expensive and are usually beyond the capability of the GoT to produce.

173. The proposed project, therefore, intends to build the foundation for the GoT to gradually obtain the needed technical capacity to closely monitor the coastal dynamics of vulnerable coastlines, design locally-appropriate coastal protection measures and implement the measures that are within their technical and financial capabilities.

41 UNCTAD (2012). Vulnerability Profile of Tuvalu.
42 International Labour Organization (2010). *Decent Work Country Programme – Tuvalu (2010-2012)*.

E.5. Country Ownership

Beneficiary country (ies) ownership of, and capacity to implement, a funded project or programme

E.5.1. Existence of a national climate strategy and coherence with existing plans and policies, including NAMAs, NAPAs and NAPs

174. The proposed project is in line with, and supports, the implementation of the following national priorities:

- ***Te Kakeega II: National Strategies for Sustainable Development 2005-2015 (TK-II)***. It is envisioned that in the year 2015, Tuvaluans will have more employment opportunities, higher economic growth, better health and education, improved basic infrastructure and with continued social stability. The vision is articulated in the Malefatuga Declaration, which is the foundation of TK-II and from which arises the National Summit on Sustainable Development. A new national development plan beyond 2016 is currently under development.

- ***Te Kaniva: Tuvalu Climate Change Policy:*** The vision is "to protect Tuvalu's status as a nation and its cultural identity and to build its capacity to ensure a safe, resilient and prosperous future." Goal 4, Developing and Maintaining Tuvalu's Infrastructures to Withstand Climate Change Impacts, Climate Variability, Disaster Risks and Climate Change Projection, Strategy 4.2 Physical planning and development control for Funafuti and the Outer Islands. Expected outcome, "Coastal protection and causeways constructions followed best practices appropriate for Tuvalu's situation and reduce vulnerability to the impacts of climate change, climate variability and ecological hazards." GOAL 7: Guaranteeing the Security of the People of Tuvalu from the Impacts of Climate Change and the Maintenance of National Sovereignty.

- ***Cross-Cutting Policy and Disaster Risk Management (2012-2021) and Tuvalu National Strategic Action Plan for Climate Change and Disaster Risk Management 2012-2016 (NSAP, 2012)*** recognizes the need to strengthen Tuvalu's systems, institutions and individual capacities to better address land degradation in Tuvalu. These integrated policy and action plan development was coordinated through the MFATTEL, and proposes a framework that will build human capacity through addressing issues (such as food security, land and water) that affect Tuvalu's natural resources and strengthen community resilience.

175. ***National Adaptation Programme of Action (NAPA), 2007*** highlights 7 key priorities:

- Coastal protection through increasing resilience of coastal areas and settlements;
- Agricultural protection, through the use of salt tolerant species;
- Water access, in particular during frequent water shortages;
- Health improvement, through the control of vector borne/climate sensitive diseases and access to quality potable water;
- Fisheries conservation of highly vulnerable near-shore marine ecosystems;
- Promoting alternative Fisheries resources and coral reef ecosystem productivity; and
- Disaster preparedness and response through strengthened community capacities.

176. ***National Adaptation Plans (NAP)***: Initial consultations and scoping have been initiated for Tuvalu to embark on medium and long-term adaptation planning through the NAP process. Coastal protection is likely to be a vital aspect of island level medium and long-term adaptation planning priorities.

177. The proposed project has been designed and developed with full ownership of the GoT through a series of consultations, at all levels of the government and at island community level. Multi-stakeholder consultations including with government agencies, NGOs, CSOs, and partners were conducted during June 2015 culminating in a GCF concept for further development with guidance from relevant stakeholders. Representation of women was ensured through the participation of community-level organizations as well as by including female staff members of the relevant partner agencies. Furthermore, the Feasibility Study (Annex II) was developed as a result of extensive stakeholder engagement and consultations with World Bank and JICA who produced two of the underlying feasibility studies on which the proposal is built. A series of consultations led by the Prime Minister's office (NDA) were conducted to gather feedback and obtain a buy-in on the proposal. All relevant stakeholders at the pre-appraisal meeting held on September 29, 2015 endorsed the

final proposal (See Annex VII). The NDA has issued a 'no objection' letter for the submission of the proposal reiterating GoT's commitment and ownership of the proposal, which is in-line with the country's national strategies and priorities. A series of follow up meetings were held in 2-9 February 2016 with participation from UNDP, during which the scope of the project was further strengthened.

E.5.2. Capacity of accredited entities and executing entities to deliver

Capacity of Accredited and Executing Entity: UNDP

178. See also Section C.4. UNDP has the required operational, financial and technical capacities to effectively manage and guide this project in Tuvalu under the umbrella of the United Nations Development Assistance Framework (2008-2012 UNDAF for the Pacific Sub-region) and the its extension (2013-2017). The Tuvalu 2013-2017 UNDAF country results matrix indicates four priority outcomes, including "4.1 Environmental sustainability and sustainable energy are mainstreamed into regional and national policies, planning frameworks and programmes. Pacific communities effectively manage and sustainably use their environment, as well as natural and cultural resources" and "4.2 Pacific communities effectively manage and sustainably use their environment, as well as natural and cultural resources". The UNDP national level support to Tuvalu is detailed in the UNDP Sub-Regional Programme Document for Pacific Island Countries 2013-2017 with one focus being 'Environmental management, climate change and disaster risk management'.

E.5.3. Engagement with NDAs, civil society organizations and other relevant stakeholders

179. The proposed project is informed by the several rounds of discussions with stakeholders at the national and island levels on climate change adaptation options and priorities in Tuvalu. The project builds on past and ongoing partnership between the GoT and UNDP with financing from the LDCF, GEF Trust Fund and bilateral sources such as the Government of Australia.

180. All of the country's islands were visited in 2007-2008 during the development and implementation of the NAPA 1 project. Community members, *Kaupules* and *Falekaupules* were consulted with regards to their priority actions to address vulnerability and enhance climate change resilience, with more than 50% of the population engaged. All islands indicated coastal protection was a priority action for climate change resilience and Nukufetau, Funafuti, Nanumea and Nukulaelae selected coastal protection measures as investments to be supported through NAPA 1.

181. Multi-stakeholder consultations including with government agencies, NGOs, CSOs, and partners were conducted during June 2015 culminating in a GCF concept for further development with guidance from relevant stakeholders. Representation of women was ensured through the participation of community-level organizations as well as by including female staff members of the relevant partner agencies. Furthermore, the Feasibility Study (Annex II) was developed as a result of extensive stakeholder engagement and consultations with World Bank and JICA who produced two of the underlying feasibility studies on which the proposal is built. The study reflects the learning, knowledge, and experience from the ongoing efforts and priorities and needs of the various stakeholders. The proposal was finalized with further stakeholder consultations facilitated during the pre-appraisal meeting that was held on September 29, 2015. The meeting was led by the Prime Minister (NDA) and various government agencies, CSOs, as well as private sector. The list of the stakeholders and key outcomes of the meeting are summarized in Annex VII.

182. The number of civil society organizations is limited in Tuvalu; there are no NGOs that have presence in all of the outer islands except for the Tuvalu Red Cross. Therefore, at the island level, CSOs will be engaged, including Tuvalu National Council of Women, Church organisations and Tuvalu Youth Development. Furthermore, Tuvalu Association of NGOs (TANGO), Tuvalu Council of Women's Association (TCWA), and Tuvalu Red Cross will play an important role in the project and Project Board to ensure that all stakeholders, including civil society organization, women, men, youth and children are engaged meaningfully in and benefit equally from the project implementation.

183. All consultations were led by the Climate Change Policy Unit of the Office of the Prime Minister and Department of Environment and the project will continue to engage various stakeholders (government agencies, NGOs, CSOs, private sector, and communities) extensively during implementation to establish the sites for coastal protection, design and implement suitable adaptation measures, support O&M and know-how, and to promote awareness on climate change and coastal protection and management. The detailed stakeholder engagement plan is provided in Annex XIII.

184. As described throughout this proposal, the project will pay a particular attention to the engagement of youth as a positive force for transformational change. The overall youth engagement strategy for the project is guided by UNDP's first corporate Youth Strategy "Empowered Youth, Sustainable Future," which is built on a four-pronged approach of 1) support through capacity development; 2) engage through advocacy and mainstreaming; 3) influence through thought leadership; and 4) sustain through national polity. For more details, see Annex XIII.

185. For implementing development projects which have community (island)-based activities, a particular attention must be paid in the logistical arrangement and in the way island communities are engaged in project activity. The strategy used in this project will build on critical lessons obtained within UNDP over years through the implementation of the two LDCF-financed project. This is detailed in the Community Engagement Strategy in Annex XIII.

E.6. Efficiency and Effectiveness

Economic and, if appropriate, financial soundness of the project/programme

E.6.1. Cost-effectiveness and efficiency

186. The proposed project will reduce the vulnerability of three islands of Funafuti, Nanumea and Nanumaga to coastal inundation and erosion. It is expected that this objective will be achieved in a cost-effective manner through the following considerations that have been reflected in the design of the project.

- Selection of appropriate mix of coastal protection options, both soft and hard, based on detailed site-specific assessments and public consultations, taking into considerations the O&M requirements
- A comprehensive approach to removal of multiple barriers

187. In this project, the use of a mix of options, both soft and hard, for coastal protection will be explored and will improve the cost-effectiveness of the coastal protection solutions considered. While 2,210m of high-value vulnerable coast will be equipped with hard-engineered solutions, the project also places emphasis on introducing EBA-based coastal protection measures in less high-value zones. During the implementation of the project, advantages and disadvantages of options such as geo-textile container revetments, dune restoration, or hybrid of the two, or even the possibility of relocating the boat access channel, will be fully discussed so that community acceptance to a range of options increases and optimal solutions can be obtained from the perspectives of society, economics and engineering integrity.

188. Second, as discussed in detail in the barrier section, the proposed project will address a range of issues that arise from the piecemeal approach to coastal protection in the past that have prevented effective solutions from emerging. Due, largely, to financial constraints, the limited number of support that did exist in Tuvalu focusing on building coastal resilience, focused on removing a barrier or two at a time. The proposed project, on the other hand, will remove a range of barriers under a single project framework, namely, the capacity barrier not only among the current but also future generations, financial constraints, and the local governance and domestic climate finance bottleneck. If addressed simultaneously, the development and transformational impact from the project are expected to be greater.

Adequacy of financing structure

189. The proposed investments in the areas of coastal protection, capacity building, and support in establishing a sustainable financing mechanism for continuous monitoring, maintenance and expansion of coastal protection, are considered a public good. Furthermore, this is an area for which the GoT has struggled to date to attract even international development finance because of the large capital investments required.

190. However, this project has been designed to crowd in potential public finance once the existing barriers are sufficiently removed. Output 1 and 3 have been consciously designed to leverage limited, but available domestic financing at the outer island level for the maintenance and expansion of coastal protection. The detailed island-level coastal assessments, which are envisaged to be carried out in all inhabited islands of Tuvalu, and successful demonstration of coastal protection investments through this project, will remove an entry barrier for other donors to finance similar needs in the remaining islands.

E.6.2. Co-financing, leveraging and mobilized long-term investments (mitigation only)

Not applicable

E.6.3. Financial viability

191. The proposed project does not involve any revenue generating or cost-recovery based outputs. As such beneficiaries of the project, largely people and their businesses, will not be expected to pay for any of the services (e.g. safety from intensifying wave action). Hence, a financial analysis is not deemed relevant.

192. That said, the GoT will be investing in O&M related to the planned infrastructure developments for coastal protection. Approximately $128,713 per year will be made available through the GoT's own infrastructure management fund for this purpose for the course of 15 years after the project completion. The technological solutions that are to be implemented in the three islands have been selected in part because they command relatively low maintenance requirements and are also deemed to be effective in averting damages from coastal inundation. The draft O&M plan is presented in annex XIII and described in section D.2 above. Public Works Department, island *kaupules* and local community will be responsible for the maintenance of the coastal protection works, under the oversight provided by the Office of Prime Minister. Commitments to ensure viability of the proposed public works has been made as outlined in Annex IV.

E.6.4. Application of best practices

193. The design of the proposed GCF project incorporates lessons and best practices from several other projects to bring about transformative impact that is effective, efficient and sustainable. These lessons include a) the use of locally-appropriate technologies based on information available that are expected to be most cost-effective; b) the effectiveness of comprehensive barrier removal strategy; c) an innovative approach for "capacity development" in the Tuvalu context; and d) the critical importance of leveraging available local resources for promoting longer-term autonomous adaptation. These lessons have been derived from experiences from the first LDCF-financed project in Tuvalu, and community-based adaptation initiatives in other SIDS from the region.

194. The coastal protection interventions proposed are based on the best knowledge available on coastal protection in the country and the region. The globally recognized three broad strategies for coastal vulnerability – retreat, accommodate and protect – have been carefully reviewed. The options proposed in the project are a result of a review of options for Tuvalu against these strategies. Potential coastal protection options were also informed by the three assessment studies conducted by UNDP, World Bank and JICA which offer a portfolio of options that are considered technically feasible in the context of Tuvalu. Based on a review of these reports as well as an assessment of local environmental, topographic and oceanic conditions[43] the following options have been proposed:

- **Geo-textile container revetment** (Outer islands only) have been proposed because they offer a sufficient level of protection while being logistically manageable compared with the options considered for Funafuti. Also an advantage of this option is that it provides some flexibility when there is a high degree of uncertainty about the level of threat such as in Tuvalu. Their construction and design is less complex than permanent seawalls and can be constructed by local labor using aggregates extracted directly on-site. This intervention has an advantage for very remote islands where transportation costs and logistical challenges could limit the construction of more complex interventions. (Found in Redcliff, Moreton Bay Australia; Manase, Samoa)
- ***Rock armour revetment*** are robust structures that provide a considerable level of protection. Design built with igneous rock provides higher protection, but need to be build using heavy machinery and using imported materials. (Found in Mission Beach, Queensland, Australia)
- **Pre-cast concrete (Seabee) revetment** combined with wave return wall are an effective solution to protect from flooding in high value asset areas. They involve local labor and need to be well designed and carefully constructed to resist overtime. Part of the materials will need to be imported. This option will be mixed with the rock armour revetment to overcome a drawback of the latter (Found in Boigu Island, Torres Strait, Australia)

195. The review and selection of the above mentioned options were done with a full recognition that, presently, international best practice leans towards the implementation of coastal protection strategies that aim to work with the natural processes rather than challenging the forces of the ocean head on. Also there was a recognition that the use of

[43] For Funafuti and Nanumea, the existing JICA and UNDP reports, respectively, provide information on these conditions. For Nanumaga, the assessment is based only on an observation of a satellite imagery.

hard engineering structures should not be considered as inconsistent with the use of softer solutions such as dune restoration and coastal vegetation. The possibility of introducing, combining, or in some cases, substituting hard engineering solutions with softer solutions, will be assessed and validated during the project implementation.

196. *Best Practices from the Pacific*[44] have also been taken into account in the design of the proposed project in terms of implementation approach. The study reviews lessons learnt from coastal protection projects implemented across 17 countries in the Pacific[45] and concludes that:

- In order for hard infrastructures to be an effective solution, it must be based upon rigorous site-specific feasibility studies. The report highlights case studies in the Pacific where poor seawall designs have resulted in "maladaptation" where communities have been harmed, rather than benefited, by coastal protection measures during extreme events in which debris detached from the defense caused damages to houses, agricultural land and other assets.
- Hard infrastructure investments for coastal protection must be combined with solid sustainability measures. Coastal protection structures can provide long lasting protection to the community, but in case they are not properly maintained their lifetime will be reduced substantially and might result in maladaptation as previously described.

197. The Study For Assessment Of Ecosystem, Coastal Erosion And Protection/Rehabilitation Of Damaged Area In Tuvalu conducted by JICA in 2010 has also been reviewed, where the importance of maintenance is emphasized in order for the coastal protection measures to function, as well as to avoid unintended negative impact to the surrounding ecosystem services. Reflecting this, the proposed project has therefore included a strong maintenance component at the national and island levels within Output 3.

198. Comprehensive barrier removal, long-term capacity building, and leveraging available local resources for promoting longer-term autonomous adaptation are all ideas that are only recently emerging in the region as a result of a trial-and-learning process. Scholarship programmes targeting students and government officers from the Pacific SIDS have existed for many years with financial support from countries like Australia and New Zealand. However, programmes that specifically aim to build climate change adaptation professionals are still limited to a few in the region such as the SPCR program in Tonga. Furthermore, programmes that specifically target students with the explicit intent to absorb them in existing adaptation initiatives after graduation is an innovative element of this project.

199. The importance of local governance and the effective use of available island-level finance has long been recognized in the region but extensive donor support in this area is sporadic. UNDP, in partnership with the Commonwealth Local Governance Forum, has provided technical assistance in this area (2005-2013) to a number of countries in the region. In Kiribati, GIZ is also providing technical assistance in the same area.

200. The comprehensive barrier removal approach is largely a result of UNDP's long years of engagement in the countries in the region, including Tuvalu. In the area of climate change adaptation, UNDP was invited as a partner for NAPA formulation and an executing agency for the first and second NAPA follow-up projects financed by LDCF. The recognition for the critical need for designing projects that aim to remove complex, interrelated barriers for achieving sustainable development has gradually emerged in the process of this partnership.

201. Lastly, the ways in which outer island communities will be engaged during the project implementation are based on critical lessons obtained within UNDP over years through the implementation of the two LDCF-financed project. This is detailed in the Community Engagement Strategy in Annex XIII.

E.6.5. Key efficiency and effectiveness indicators

GCF core indicators	Estimated cost per t CO_2 eq, defined as total investment cost / expected lifetime emission reductions (mitigation only)
	Not applicable

[44] Peaniu et al.,(2015) Coastal Protection: Best Practices from the Pacific. http://repository.usp.ac.fj/8219/
[45] 5 of them with comparable socio-economic and environmental conditions to Tuvalu

	Expected volume of finance to be leveraged by the proposed project/programme and as a result of the Fund's financing, disaggregated by public and private sources (mitigation only)	
	Not applicable	
Other relevant indicators (e.g. estimated cost per co-benefit generated as a result of the project/programme)		*Not applicable*

F.1. Economic and Financial Analysis

202. An economic cost-benefit analysis of the project was carried out in accordance with the Guidelines for the Economic Analysis of Projects of United Nations Development Program (UNDP 2015). The feasibility of the investments was determined by computing the net present value of the proposed project using a 10% discount rate. The period of analysis covers 40 years.

203. The expected benefits of the proposed project were estimated using the Country Risk Profile for Tuvalu prepared by the Pacific Catastrophe Risk Assessment and Financing Initiative in September 2011 (Annex XIII). This is the most recent assessment that has credible estimates of expected future losses in Tuvalu. Table 2 of the Profile presents "Estimated Losses and Casualties Caused by Natural Perils" for cyclones and tsunamis with mean return period of 50, 100, and 250 years. Damages therefore were estimated for a return period of 50, 100, and 250 years. While a more complete damage curve should also include a return period of 1 year, 5 year, 10 year, and 25 year, in the absence of estimates of damages for these shorter return periods, estimates of damages used in the analysis are solely for 1/50, 1/100 and 1/250. The losses presented in Table 2 of the Profile include the cost of repairing or replacing damaged assets as well as emergency costs. It is important to note that the estimated losses presented in the Tuvalu Country Risk Profile do not include any other losses such as contents losses, cost of displacement, loss of environmental assets in terrestrial and marine areas, business interruption losses, and losses to primary industries other than agriculture.

204. Based on the numbers presented in Table 2, we estimate an annual expected loss of $53.18 per capita in 2010. Once adjusted for inflation, this value becomes $59.42 in 2015. This annual expected loss is then assumed to remain constant in real terms over the period of analysis. Hence, in the absence of any adaptation, expected annual losses amount to $59.42 per capita per year in Tuvalu. This number includes estimates of the value of statistical life which is an intrinsic part of cost-benefit analysis (and does not and should not be interpreted to reflect the "value of life").

205. Given the above numbers, and assumptions underpinning the analysis including frequency of return periods of extreme events and the estimated cost of the project, the net present value of the project is negative and amounts to approximately $15 million upon using a 10% discount rate. The overall NPV remains to be negative even with a 0% discount rate. Table 2 also presents estimates of casualties as a result of these events. It should also be noted that in estimating the net present value of the proposed project, it has also been assumed that Tuvalu's population remains constant over the period 2015-2055. In doing so, the true expected benefits of the proposed project are thus under-estimated.

206. Consequently, the negative NPV for this project should be treated with a significant amount of caution. First, not all benefits that ought to have been included in the analysis are accounted for; only those for which reliable estimates of damages exist have been used. The absence of reliable damage estimates for a number of important impacts is a major constraint in accurately reflecting the benefits of the proposed intervention. Second, there are social and cultural reasons for the proposed investment. The fact of the matter is that short of relocating Tuvalu's population and assets away from Tuvalu no other solution is going to have any meaningful impact on reducing the current and future impacts of increased wave intensity that is affecting Tuvalu's coastline. However, moving people and assets from outer islands to Funafuti is not an option for so many cultural, ethical and practical reasons. Nor is it feasible to move people and assets within Funafuti. Moving people and assets away from Funafuti to outer islands is also not an option. Moreover, "cheaper" solutions including soft solutions such as mangrove plantations will not be possible in some locations because some of the islands are coral islands and the soils are not conducive for mangroves to take root. Moreover, ecosystem based solutions alone will not be effective to safeguard people and assets that are already highly exposed to the elements. Nor will building concrete seawalls around each island be economically possibly nor practical. Through this process of elimination, the only remaining options are a combination of engineered ('hard') coastal protection as proposed complimented with some ecosystem based solutions. These options still warrant a high expenditure given Tuvalu's geographic remoteness and capacity limitations.

207. On the above basis, the proposed project is deemed to be justifiable on social reasons. The people and assets of Funafuti, Nanumea and Nanumaga simply do not have any other alternatives to protect themselves from the wave actions that are adversely impacting the coastline on an increasingly regular and intensive basis.

F.2. Technical Evaluation

208. This proposal builds on an analysis of international best practices, extensive experience of the authors of this proposal in undertaking similar projects in the Pacific, lessons from on-going efforts in Tuvalu, and several pre-feasibility assessments carried out in the country recently. A Feasibility Study assessing the various options for consideration including a Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis is presented in Annex II. An analysis of international best practices (ranging from 'retreat', 'accommodate', or 'protect') reveals that an effective use of 'protection' with an appropriate mix of hard and soft solutions and becomes extremely important in Tuvalu where alternatives are highly limited.

209. Previous studies (JICA 2011; UNDP 2014; World Bank, 2015) have also identified several options suitable to alleviate some of the erosion and inundation problems currently facing Tuvalu. The assessment, supported by the LDCF-financed UNDP project, was carried out in two islands of Nukufetau and Nanumea. The World Bank assessment was carried out for all islands as part of post-TC Pam recovery assistance. The third study conducted by JICA in 2011 explored in detail the application of gravel beach nourishment and reclamation along 2.6 km of the western (lagoon-facing) shore of Fongfale Island in the Funafuti atoll[46].

210. Both the UNDP project and World Bank reports suggest that structural solutions utilizing geo-textile sand container revetments may be an appropriate adaptation measure for the outer islands. As described earlier, geo-textile revetments are considered suitable in the context of outer islands because of several reasons: first, they offer some flexibility when there is a high degree of uncertainty about the level of threat while providing a sufficient level of protection; and relative ease of logistical management compared with other engineered solutions, which is critical in outer islands where landing facilities do not exist.

211. Technical evaluation of the various measures for the different sites suggests a mix of hard and soft engineering solutions. In Funafuti, the proposed project aims to rehabilitate 1,000 m of the eroded and degraded foreshore on the lagoon-side of Vaiaku waterfront of Fongafale Island. This area is important economically and socially as it fronts Tuvalu's largest population center and is the center of commerce and trade for the nation. Based on the feasibility and scoping studies already completed, it is concluded that rock armor revetments and seawalls made from precast concrete units (Seabee) would provide the most cost-effective solution for the condition in Funafuti.

212. For Nanumea, the geo-textile container revetment is an attractive and viable option for the following reasons. Presently, only a very narrow beach exists between the village and the reef flat. This restricts the potential effectiveness of ecosystem-based adaptation options such as sand redistribution and beach nourishment, dune and beach ridge restoration. Alternatively, the reconstruction, removal or relocation of vulnerable structures were considered considering that the vulnerable shoreline is facing the outer ocean, i.e. high level of exposure, but rejected immediately due to the lack of space available to the community for relocation. Thus, it is proposed that a sand-filled geo-textile revetment be constructed along the length of the vulnerable shoreline of the village. Such structures have been shown to be highly durable and long lasting and able to withstand the impact of large cyclone driven waves and tides.

213. In Nanumaga, a geo-textile revetment fronting the village is also a possible solution for protection from future storm surge events. However, before the detailed design of this option is finalized, several issues need to be addressed. First is the possibility that under storm conditions, a highly reflective seawall located at the upper beach would enhance erosion and loss of sand, rendering the beach less resilient to future storm surges. Second is the issue of access from the village to the sea. A geo-textile revetment constructed between the village and the beach would impede pedestrian access forcing people to climb over and down the structure to get to the other side. Not only would this be troublesome, but it could lead to premature and unnecessary damage to the structure itself. Alternatively, if a gap were left in the wall for pedestrian access, it would render the rest of the barrier ineffective as flooding storm surges would enter the village through the gap. Implementation of this solution would therefore require prior public consultations to understand the mobility patterns and needs of the affected population in terms of using the beach and their day-to-day interaction with the coastline. This could lead to consensus on alternative routes for accessing the coast including walkways constructed over the revetment.

[46] The scope of the investment was scaled back to 180m subsequently.

214. Other complimentary options for Nanumaga include reestablishing the dune and beach ridge to an appropriate elevation and controlling foot traffic through the establishment of elevated wooden walkways to reduce the degradation of the dune and enhance the natural coastal protection function of this important geographic feature. A possible long-term option could also be the relocation of the boat access channel to divert foot traffic around any proposed sea wall.

215. For all three of the sites targeted in this funding proposal, island-level surveys of the oceanographic and coastal environment as well as public consultations would be required to finalized the detailed design of the structure.

F.3. Environmental, Social Assessment, including Gender Considerations

216. This project has completed the UNDP social and environmental screening procedure (see SESP attached as Annex VI(a)). This screening was undertaken by a highly experienced coastal and marine ESIA specialist to ensure this project complies with UNDP's Social and Environmental Standards. UNDP's Social and Environmental Standards were reviewed by the GCF accreditation panel and deemed sufficient to accredit UNDP to submit low and medium risk projects. Based on the specialist's extensive experience of undertaking ESIA on some of the largest port and coastal developments internationally (including the largest export port in the world, mega port and coastal development projects in World Heritage Areas, projects requiring dredging of up to 60 million m^3) as well as small to medium scale coastal developments and coastal protection infrastructure in the Pacific of a very similar nature (e.g. coastal protection infrastructure in Kiribati, Samoa and Tonga), the overall social and environmental risk category for this project is **Moderate**. It is highly unlikely that the project will have any medium to long term and/or irreversible impacts, and potentially moderate risks associated with the proposed construction of coastal protection structures and dredging of materials can be sufficiently managed. Specific project risks are listed in Section G below, together with appropriate mitigation measures. There are three key factors that determine that this project is classified as a Category B (or Moderate Risk) project:

a. The proposed project will not be undertaken in pristine or protected areas where the construction of a built structure could potentially cause irreversible changes to the biological, ecological and physical environment. The project will be undertaken in areas that have been impacted by both anthropogenic and natural processes (e.g. Cyclone Pam in March 2015) in the past and that have ever changing environmental conditions through hydrodynamic and coastal processes as an example.

b. The coastal protection measures that are considered in the project (i.e. igneous rock armour revetment, geo-textile container revetment, and pre-cast concrete revetment (Seabee)) will be parallel to the existing beach profile and coast line. These structures, in comparison with those that extend out to sea (e.g. through the construction of a groyne, revetment or breakwater as constructed to protect port infrastructure as an example), are expected to have much less significant impact on coastal hydrodynamic processes as they will follow the existing coastal profile. Similar projects of this nature in the Pacific Islands have been considered as Category B projects and have been approved by international organisations following the preparation of an Initial Environmental Examination (IEE) rather than a full ESIA (e.g. CIF-Funded ADB project in Tonga for coastal protection works as discussed above that the specialist was involved in and wrote the IEE). The beach profiling proposed as part of the project (see E.3 above) will also be undertaken pre and post construction to provide a definitive baseline that will be used in the engineering design to avoid adverse environmental and social impacts. This is a consistent approach used throughout the Pacific.

c. Dredging will be extremely limited (approximately 30,000m^3) in contrast to large dredging projects that are considered to be of greater risk based on international practices (for example, the specialist has recently completed a Public Environment Report – a lower level assessment than an ESIA for a 3 million m^3 capital dredging campaign within the Great Barrier Reef World Heritage Area). Further, the amount of sediment being dredge is significantly less than normal maintenance dredging undertaken at many ports throughout the Pacific which do not require an environmental impact assessment but are undertaken consistent with an ESMP. Importantly, the type of dredge proposed (backhoe) to undertake dredging will have significantly less impact on the marine environment as there is no overflow that can impact water quality.

217. The investment is expected to deliver the following economic, environmental and social benefits across the project area:

a. Reduced loss of assets including houses and property, which will raise environmental and social wellbeing and economic productivity;

b. Reduced sea flood damages through improved coastal protection;

c. The development of new habitat for marine fauna;

d. Increasing capacity through education programs on climate change

Coastal Protection Infrastructure

218. Notwithstanding that the proposed coastal protection infrastructure is small scale in nature, there are a range of low to moderate environmental and less so, social impacts associated with the construction of the coastal protection infrastructure. The impacts include:

a. Sedimentation of the marine environment through the movement of sediment to set the base for the construction of the infrastructure;
b. The low level impacts on marine and terrestrial systems as a result of potential fine scale hydrodynamic changes in coastal processes;
c. Limited changes in the habitats where dredging and/or sediment/gravel collection takes place (previous research indicates marine fauna in these areas quickly re-establish, often above the ambient environment (for example, Moreton Bay Sand Extraction studies));
d. Limited potential for the entrainment and impingement/entrapment of higher order marine organisms during construction of coastal infrastructure (it is anticipated that there will be an impact on sessile marine invertebrates during the construction of the coastal protection infrastructure; however it is well established that these animals are highly resilient to change from living in a dynamic environment and quickly re-establish following any impact);
e. Terrestrial and marine noise during the dumping of rock; and
f. The anticipated waste associated with construction of the project will be limited to damaged sand-filled geo-textile containers bags, although it is anticipated that this waste will be extremely limited.

219. Prior to the commencement of the construction, a number of environmental studies should be undertaken including:

a. Chemical, ecological and physical assessments (and associated modelling) that consider the adjacent marine ecosystems including but not limited to, marine water quality within the areas of influence, disturbance to habitats through the placement of infrastructure, noise, and vibration impacts, impact on benthic biota, and potential contamination from disturbed acid sulfate soils. All these studies should consider spatial and temporal characteristics (there is significant information already available within the JICA report);
b. Hydrodynamic modelling to ensure the coastal protection infrastructure do not result in changes to sediment deposition;
c. An assessment of proposed locations where dredging and/or sediment collection will take place; including an assessment of existing water quality; marine habitats and species utilization and any important use of this area by species or humans (e.g. fishing grounds) and what impacts might occur and how quickly the locations will recover, particularly re benthic fauna, any seagrass, water quality and other relevant issues (see note above);
d. An assessment of the location of any important fishing grounds to the local community that may be impacted by the construction of coastal protection infrastructure. This information will be gained from consultation with the local community; and
e. A terrestrial and marine noise assessment to ensure the construction of coastal protection infrastructure does not have an impact on human communities and marine fauna, respectively.

220. Stakeholder consultation should be conducted to ensure appropriate land title is not impacted and that information is gained to feed into the environmental studies.

Social assessment

221. There are limited social impacts associated with the coastal protection infrastructure. Importantly, no people will be displaced or relocated. Careful planning and stakeholder consultation will be undertaken prior to determining the specific locations of the coastal protection infrastructure which will ensure communities are not negatively impacted. Further, stakeholder consultations will be undertaken when assessing the sites that might be utilized for the supply of sediment. There may potentially be an impact on fishers currently utilizing areas in proximity to the coastal protection infrastructure and or dredging locations. This risk could potentially materialize in two ways: First is through the impediment of pedestrian access to the coast caused by a coastal protection structure; second is through the disruption of fishing grounds during the sourcing of sand materials or construction of a coastal protection structure. To ensure there is limited impact on people, community consultation will be undertaken to ensure the infrastructure and dredging are not located in important fisheries areas. Where available, local people will be employed to undertake construction and maintenance of the coastal protection infrastructure, thereby providing a social benefit to the community.

Gender considerations

222. Acknowledging that men and women derive benefits differently from access to ocean (i.e. collection of shellfish, crustacean, shrimps in the nearshore area is typically a responsibility of women and children while men tend to engage more in pelagic or coastal fishing) and are impacted differently at the time of extreme events, the project has been designed with a special to gender considerations. Women and women's association have been separately engaged during consultations; Tuvalu's relevant policies and strategies on gender have been reviewed; information and lessons from past studies and assessments have been incorporated into the design of the GCF project; and gender considerations have been integrated into the project indicators, targets and activities. At the end of the project implementation, the project will specifically look into gender-differentiated impact of the project by engaging a technical specialist. Results from this assessment will be widely disseminated at a regional or national workshop, contributing to heightened awareness and understanding about the impact of coastal protection on gender equality or empowerment.

223. Apart from the gender impact of coastal protection, the project will also contribute to women's empowerment through two additional avenues: enhanced participation and increased responsibilities. One of the fundamental principles of ISP support is participatory development planning, budgeting, execution and monitoring. Unlike the conventional communal decision making process in Tuvalu, where the island assembly is open only to men over the age of 50, the ISP formulation process opens the door to all in the society, including women and youth. The project will build on the community mobilization platform being used in the baseline UNDP projects and provide an opportunity for women to raise and reflect their concerns, in relation to climate change and coastal vulnerability, into their own island development plan.

224. Moreover, the project's gender-responsive strategy will go beyond promoting women's token participation. As an integral part of the ISP process, women's group members will be given specific responsibilities to monitor the execution of ISP priorities and island budget through the participatory video tool.

225. General awareness raising about climate change and coastal processes will be mainly delivered through engagement of school teachers. This is likely to have a positive gender spillover effect as 83 percent of teacher positions in the country is held by women, and the additional knowledge, information, and skills that teachers will learn through this GCF project will contribute to empowering female teachers.

226. In addition, the project will create a condition where some of the additional responsibilities that women will take on will be financially rewarded. More specifically, women members of society, in addition to youth groups, will receive skill trainings on beach profile survey, basic monitoring and maintenance of the coastal protection structures, and execution of simple 'soft' coastal protection measures, and these responsibilities will be financially rewarded, initially through the project budget during the implementation, but through the island-level development grants after the project closure. It is expected that 36 people will be newly recruited and trained for beach profiling and at least half of them will be women. There is one Land Clerk in each island (total of nine) who will also be trained on beach profiling. Four out of nine of them are currently women. The scholarship programme will target 24 students to obtain higher degrees in disciplines that are specifically relevant for coastal protection, and the minimum 50 percent target will be adhered to. Through these efforts, the project will ensure significant gender benefits (See Section E.3.1). During consultations, those that were directly linked to expanded economic opportunities (such as the recruitment of women for beach profiling and monitoring and maintenance of the coastal infrastructure) were particularly welcomed by women. The Gender Assessment and Action Plan for this project is presented in Annex XIII.

F.4. Financial Management and Procurement

227. The financial management and procurement of this project will be subject to UNDP financial rules and regulations available here: https://info.undp.org/global/documents/frm/Financial-Rules-and-Regulations_E.pdf. Further guidance is outlined in the financial resources management section of the UNDP Programme and Operations Policies and Procedures available at https://info.undp.org/global/popp/frm/Pages/introduction.aspx. UNDP has comprehensive procurement policies in place as outlined in the 'Contracts and Procurement' section of UNDP's Programme and Operations Policies and Procedures (POPP). The policies outline formal procurement standards and guidelines across each phase of the procurement process, and they apply to all procurements in UNDP. See here: https://info.undp.org/global/popp/cap/Pages/Introduction.aspx.

228. The project will be implemented following the Direct Implementation Modality (DIM) following UNDP POPP available here: https://info.undp.org/global/popp/frm/Pages/direct-implementation-dim-modality.aspx. For project activities carried out by the government as a Responsible Party, fund transfer to the government shall follow DIM guideline. UNDP will ascertain the national capacities of the implementing partner by undertaking an evaluation of capacity following the Framework for Cash Transfers to Implementing Partners (part of the Harmonized Approach to Cash Transfers - HACT). All projects will be audited following the UNDP financial rules and regulations noted above and applicable audit guidelines and policies.

229. During implementation, UNDP will provide oversight and quality assurance in accordance with its policies and procedures, and any specific requirements in the Accreditation Master Agreement (AMA) and project confirmation to be agreed with the GCF. This may include, but not limited to, monitoring missions, spot checks, facilitation and participation in project board meetings, quarterly progress and annual implementation reviews, and audits at project level on the resources received from UNDP.

230. The project will be audited in accordance with UNDP policies and procedures on audits, informed by and together with any specific requirements agreed in the AMA currently being negotiated with the GCF. According to the current audit policies, UNDP will be appointing the auditors. In UNDP scheduled audits are performed during the project cycle as per UNDP assurance/audit plans, on the basis of UNDP's guidelines. A scheduled audit is used to determine whether the funds were used for the appropriate purpose and in accordance with the work plan. A scheduled audit can consist of a financial audit or an internal control audit.

231. UNDP provides a variety of assurance activities which will comprise of (but not be limited to): (1) *Periodic on-site reviews (spot checks)* of the financial records of the project. These may be performed by qualified UNDP staff or third party service providers; (2) *Programmatic monitoring* of activities, which provides evidence regarding the state of project implementation and use of the GCF resources; and (3) *Scheduled and special audits (financial or internal control)* of the financial records. UNDP prepares and reports financial statements in full accordance with the International Public Sector Accounting Standards (IPSAS). Full compliance with IPSAS was achieved effective January 2012. IPSAS was mandated by General Assembly Resolution 60/283 and is considered best practice in accounting for public sector and not-for-profit organizations.

232. A draft procurement plan (which will be further discussed and revised prior to UNDP Project Document signature) is provided in Annex XIII.

G.1. Risk Assessment Summary

Environmental Risks

233. As identified above, the project has a number of low to moderate environmental and social risks associated primarily with the coastal protection infrastructure which will be temporally restricted except for any potential changes in fine scale hydrodynamic processes. There are also potential risks on marine ecosystems and fishing grounds associated with dredging areas although these are significantly reduced by using a backhoe dredge. The earth works will move sediment that, if not properly contained, may enter the marine environment.

234. To ensure that the sediment is not mobilized through water movement, it will be necessary to prepare an erosion control sediment plan and install silt curtains to restrict sediment movement. The plan should contain aspects including but not limited to the installation of sediment curtains to reduce sediment movement and the covering of sediment where practicable.

235. The risks associated with acid sulfate soils are considered minimum as there is no known mangrove habitats along the proposed coastlines. Prior to any excavation, however, sediments will be tested for their presence of acid sulfate soils and/or potential acid sulfate soils. If the analysis proves positive, the sediment can be treated by a range of techniques including but not limited to liming the sediment. Reference should be made to appropriate standards and guidelines[47]. Every effort should be made to ensure there is no direct or residual impact following treatment.

236. By undertaking the relevant studies and community consultation, these risks will be reduced significantly. Given the size of the coastal protection infrastructure, it is highly unlikely that, in comparison to much larger projects internationally, that they will have irreversible and/or long term significant impacts. The relevant mitigation measures are identified in Section F.3 of the proposal.

237. Overall, it is expected that the project will have some environmental impacts although these can be mitigated effectively through appropriate management measures. The project will have significant environmental benefits in the short to long term through the improvement of water quality, provision of new habitat, coastal protection, and most importantly, through providing communities with areas to live that will not be inundated during king tides and during cyclone events

Social risks

238. There are limited social risks associated with the project. Importantly, no people will be displaced or relocated. There will potentially be an impact on fishers if the location of dredging or coastal protection is an important fishing ground. Coastal protection measures may also alter the way local communities interact with the coast. Participatory local consultations will be carried out during the implementation so that views and concerns can be reflected in the adjustment of the design and construction of the coastal protection measures. Importantly, the coastal protection infrastructure will act as a buffer during storm, events and therefore reduce the potential loss of lives and assets.

Other risks

239. Several other categories of risks have also been identified during the project design. Under the technical and operational risks, there are two main risk factors that could affect the achievement of the expected results and outcomes of the project. Currently, there are two passenger boats that make scheduled trips to outer islands, in addition to one research boat owned by the Fisheries Department and one patrol boat in the country. These boats are always on high demand and the Tuvaluan seas often make these boats unnavigable. Another operational risk is the high staff turnover and the difficulty in identifying suitable candidates for project positions. Political risks are another risk category. In Tuvalu, changes of government, often through the parliamentary vote of no confidence, are frequent. While the change of government does not necessarily mean changes in policy directions, it poses a risk of delays in project decision making process.

[47] For example, refer to Ahern, C.R., Ahern, M.R. and Powell, B. (1998) *Guidelines for Sampling and Analysis of Lowland Acid Sulfate Soils (ASS) in Queensland* QASSIT, Department of Natural Resources, Resource Sciences Centre, Indooroopilly; Ahern, C.R., McElnea, A.E. and Sullivan, L.A. (2004) *Acid Sulfate Soils Laboratory Methods Guidelines*. In Queensland Acid Sulfate Soils Manual. Department of Natural Resources, Mines and Energy, Indooroopilly, Queensland, Australia; and Dear, S.E., Moore, N.G., Dobos, S.K., Watling, K.M. and Ahern, C.R. (2002). *Soil Management Guidelines. In Queensland Acid Sulfate Soil Technical Manual*. Department of Natural Resources and Mines, Indooroopilly, Queensland, Australia.

G.2. Risk Factors and Mitigation Measures

Please describe financial, technical and operational, social and environmental and other risks that might prevent the project/programme objectives from being achieved. Also describe the proposed risk mitigation measures.

Selected Risk Factor 1

Description	Risk category	Level of impact	Probability of risk occurring
Exclusive reliance on government scheduled boat and chartered boat to outer islands limit the delivery of Outcomes in a timely manner.	Technical and operational	High (>20% of project value)	Low

Mitigation Measure(s)

The logistical issues will be addressed through two risk mitigation measures. First, for the transport of construction materials and machinery, one of the selection criteria for the vendor/construction company is the transportation capability so that the project will not rely on the existing boats in the country. Second, for transporting project personnel for carrying out activities in outer islands, the partnership with the UNDP-supported LDCF and GEF project will provide a full access to a boat dedicated for these projects. This will permit the project to reliably adhere to the original island visit schedule.

Selected Risk Factor 2

Description	Risk category	Level of impact	Probability of risk occurring
Complex land tenure in project locations can cause delays and limit the successful construction of coastal protection interventions.	Social and environmental	High (>20% of project value)	Medium

Mitigation Measure(s)

The project will be along the coastline which is owned partly by the crown (seabed) and the rest by private citzens (the *Foreshore And Land Reclamation Act)*. It is expected that landowners will allow the contruction of coastal infrastructure. However, given the high number of private lands owners involved who all need to endorse the project, and this process could create delays in implementation. The project aims to work through *kapuales* to ensure that communities are part of the decision making process thus increasing ownership. The process of obtaining a community endorsement will start during the environmental and social impact assessment. Awareness campaigns on coastal protection will improve the understanding of the proposed interventions making sure they are supported and endorsed by the community.

Selected Risk Factor 3

Description	Risk category	Level of impact	Probability of risk occurring
Extreme climate events such as cyclones will affect the progress of project and moreover, the design of the coastal protection infrastructure may not withstand climate change impacts including both sea level rise and increased intensity of cyclones.	Social and environmental	High (>20% of project value)	Low

Mitigation Measure(s)

Notwithstanding that the annual probability of severe cyclones affecting the country is relatively low, coastal protection infrastructure will be designed to ensure longevity based on methodologies that considers worst case scenarios.

A state of emergency was declared in March 2015 due to Cyclone Pam and in 2010 due to a severe drought, and as a result, many government agencies were engaged in early response and recovery activities which caused delays in the implementation of the first LDCF project. In order to mitigate this risk, the constructions of the coastal protection interventions will be undertaken from April to November when the risk of cyclones is significantly lower. Also the duration of the project has been set to minimize the impact of delays.

Selected Risk Factor 4

Description	Risk category	Level of impact	Probability of risk occurring
High staff turnover and limited local human resource base could compromise the project management unit and delay implementation	Technical and operational	Low (<5% of project value)	Medium
Mitigation Measure(s)			
Project Management Unit will have some necessary "redundancies" in the functions of project personnel so that staff turnover would have minimum impact in terms of continuity of the project implementation. This is based on lessons from earliner projects. Moreover, there is an ongoing discussion between the Government and UNDP to create several positions that straddle multiple UNDP-supported projects. This will facilitate better coordination across these projects and a more flexible arrangement whereby a shortage of staff in one project can be supplemented, at least in the interim.			
Selected Risk Factor 5			
Description	Risk category	Level of impact	Probability of risk occurring
Political Risks: Changing leadership at national and local level resulting in project delays or refocus and/or suspension	Other	Low (<5% of project value)	Medium
Mitigation Measure(s)			
The probability of a leadership change resulting in refocus of the project is highly unlikely given that coastal protection is unequivocally a national priority. However, delays in project decision making is a likely consequnece. The project will work closely with the national advisory committee on climate change (NACCC) and island *Kaupules* to ensure that these key stakeholders are updated with progress and would be able to keep national and local leaders updated.			
Selected Risk Factor 6			
Description	Risk category	Level of impact	Probability of risk occurring
Spillage of construction materials. The transport and supply of material, barges, dredges, excavator, truck and any other machinery may have impacts that may arise from accidental spillage of construction materials (e.g. cement); oils and other chemical spills. Further, there may be the release of actual construction material.	Social and environmental	Low (<5% of project value)	Low
Mitigation Measure(s)			
Through compliance with the Environmental and Social Management Plan, these risks will be significantly reduced.			
Selected Risk Factor 7			
Description	Risk category	Level of impact	Probability of risk occurring
Changes in hydrodynamic processes and deleterious sediment movement as a result of the construction of the coastal protection infrastructure	Social and environmental	Medium (5.1-20% of project value)	Low
Mitigation Measure(s)			
Prior to final design and site selection of the coastal protection infrastructure, a number of environmental and social studies should be undertaken including: a. Chemical, ecological and physical assessments (and associated modelling) that consider the adjacent marine ecosystems including but not limited to, marine water quality within the areas of influence, potential contamination from marine sediments that may currently be contaminated, disturbance to habitats through the placement of infrastructure, noise, and vibration impacts, and impact on benthic biota. All these studies should consider spatial and temporal characteristics; and			

b. Hydrodynamic modelling to ensure the coastal protection infrastructure does not result in the change to coastal processes within natural variables respectively. The study should evaluate various coastal infrastructure types and design.

The information from the studies will be used to inform the environmental and social management plan for the project. The plan should ensure it includes water quality monitoring in the short to long term.

Selected Risk Factor 9

Description	Risk category	Level of impact	Probability of risk occurring
Changes in coastal erosion and/or deposition as a result of the removal of sediment/gravel for the use in the coastal protection infrastructure	Social and environmental	Medium (5.1-20% of project value)	Low

Mitigation Measure(s)

Prior to the selection of sites where material might be obtained for use in the coastal protection infrastructure, environmental and social studies will be undertaken including chemical, ecological and physical assessments (and associated modelling) that consider factors such as existing sediment erosion and deposition, potential contamination, disturbance to terrestrial and littoral zone habitats through the removal of sediment, noise, and vibration impacts and impact on biota.

Selected Risk Factor 10

Description	Risk category	Level of impact	Probability of risk occurring
Terrestrial and marine noise including through the use of construction equipment and rock dumping will occur as a result of the project. This can impact on local communities and marine and terrestrial fauna using the adjacent area.	Social and environmental	Medium (5.1-20% of project value)	Medium

Mitigation Measure(s)

An assessment of the terrestrial habitat where the coastal protection infrastructure is to be located should consider any sensitive receptors including communities. Further, noise shields should be constructed to reduce the potential for noise to reach these communities. With respect to the marine environment, the studies that will be undertaken will provide input into the final location of coastal protection infrastructure to ensure underwater noise does not impact marine organisms and sensitive receptors.

Other Potential Risks in the Horizon

Potential risks in price determination

The coastal protection work proposed will likely involve minimum of two contractors: first to carry out island-level assessments in all islands; second to construct the coastal protection structures as per the detail drawings produced as a result of the assessment process. Due to this two-step process and limited experience of coastal protection in Tuvalu at the scale proposed in the project, there is a certain level of uncertainty in the pricing of the final work contracted. Although the project budget has been developed with the best available estimates using the industry standard and through consultations with experts who have worked in the region, the overall project budget must be carefully monitored.

Potential risks of community engagement

Coastal protection is undoubtedly an urgent priority shared by all levels of society. At the same time, there is a sense of “consultation fatigue” within Tuvaluan communities. This is because of some of past development assistance that had a series of consultations without concrete benefits on the ground. This could potentially create impatient demands to see the construction as soon as the project implementation starts. To manage expectations of the community, during the initial island visits, implementation schedule, expectations, and community engagement requirements will be clearly spelled out.

H.1. Logic Framework.

Please specify the logic framework in accordance with the GCF's Performance Measurement Framework under the Results Management Framework.

H.1.1. Paradigm Shift Objectives and Impacts at the Fund level[48]						
Paradigm shift objectives						
Increased climate-resilient sustainable development	The proposed project will directly contribute to safeguarding human development progress in target islands of Tuvalu through coastal protection and thus contribute to climate-resilient sustainable development. The project approach that combines concrete investments, long-term human resource development, knowledge management, and reallocation of available domestic development budgets towards climate change adaptation will facilitate a paradigm shift that affect geographical and inter-temporal decisions that Tuvaluan will make on resilience building.					
Expected Result	**Indicator**	**Means of Verification (MoV)**	**Baseline**	**Target**		**Assumptions**
				Mid-term (if applicable)	Final	
Fund-level impacts						
A3.0 Increased resilience of intrastructure and the built environment to climate change	3.2 Number of new infrastructure constructed to withstand condition from climate variability and change	Annual progress report; mid-term review; terminal evaluation	No single engineered coastal protection solution exists in the country	N/A	3 coastal protection measures have been put in place in 3 islands	Environmental and social impact assessment is completed and approved without delay; There is a land-use agreement with the landowners

[48] Information on the Fund's expected results and indicators can be found in its Performance Measurement Frameworks available at the following link (Please note that some indicators are under refinement): http://www.gcfund.org/fileadmin/00_customer/documents/Operations/5.3_Initial_PMF.pdf

H.1.2. Outcomes, Outputs, Activities and Inputs at Project/Programme level

Expected Result	Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions
				Mid-term (if applicable)	Final	
Project/programme outcomes	**Outcomes that contribute to Fund-level impacts**					
A5.0 Strengthened institutional and regulatory systems for climate-responsive planning and development	5.1 Institutional systems that improve incentive for climate resilience and their effective action	Climate change related budget and expenditure report from island councils; Annual progress report	Only one round of ISPs has been produced and they neither are climate sensitive nor govern budget use	At least two cycles of ISP production	ISP production, execution of priority actions, and community review have become an annual event	Domestic unconditional grants (FTF/SDE) which currently finance island-level activities remain at similar volume
A7.0 Strengthened adaptive capacity and reduced exposure to climate risks	7.2 Number of males and females benefiting from climate risk reduction measures	Implementation report by construction vendor; Annual progress report; mid-term review; terminal evaluation	Currently, no Tuvaluans benefit from hard-engineered coastal protection measures	Coastal protection design and implementation started to have at least 3,100 individuals (50% women) who are in inundation areas protected by a coastal protection	At least 3,100 individuals (50% women) who are in inundation areas protected by a coastal defense	There is a land-use agreement with the landowners; Environmental and social impact assessment confirms that the proposed measures have minimum risks
Project/programme outputs	**Outputs that contribute to outcomes**					
1. Strengthening of institutions, human resources, awareness and knowledge for resilient coastal management	Number of technical officers trained on: - Monitoring / data synthesis on dynamic coastal processes - Designing of coastal protection (both hard and soft) measures - Environmental social impact assessment - Project management, V&A assessment, CBA	Annual progress report; questionnaires; mid-term review; terminal evaluation	Currently, there is no institutional arrangement where technical officers can gain technical skills	N/A	At least 12 technical government staff (50% women) exposed to hands-on trainings on the three areas	Skill building trainings do not result in accelerated turnover of staff The host departments allow their staff to be away for skill building for sustained period of time
	Number of students that are supported at higher-level studies (tertiary level or higher) on disciplines related to coastal protection work	Annual progress report; questionnaires; mid-term review; terminal evaluation	Tuvalu sponsored students in tertiary education totaled to 163[49]. DFAT(24 awards in	At least 24 students (50% women) are supported for at higher level studies AND obtain a CCA-	At least 24 students (50% women) are supported for at higher level studies AND obtain a CCA-related	The scholarship arrangement in which students are required to come back to the country after completing studies is properly enforced

[49] Figures released by Tuvalu High Commission in Suva, 21st July 2015.

			2012[50]) and NZAID (NZD 11million[51]) awarded a total of 20-30 scholarships each per year	related position in the country	position in the country	
2. Vulnerability of key coastal infrastructure including homes, schools, hospitals and other assets is reduced against wave induced damages in Funafuti, Nanumea and Nanumaga	Island-level coastal assessment report produced	Implementation report by assessment/ construction vendor; Annual progress report; mid-term review; terminal evaluation	No island-level reports containing assessment results such as local hydrodynamic processes are currently available	All 9 islands of Tuvalu has a coastal assessment report	N/A	There is a land-use agreement with the landowners; Environmental and social impact assessment confirms minimum risks
	The length of vulnerable coastlines protected	Implementation report by assessment/ construction vendor; Annual progress report; mid-term review; terminal evaluation	In the proposed locations, there is no structural measures to mitigate the risk of wave over-topping or coastal inundation events	Construction of coastal protection commenced	2,210m of vulnerable coastlines are protected by a coastal defense measure	
	Knowledge about gender-differentiated impact of coastal protection enhanced	Implementation report by assessment/ construction vendor; Annual progress report; mid-term review; terminal evaluation	Awareness about gender-differentiated impact of coastal protection is low	Island-level social impact assessment includes a section on gender	The final technical assessment report includes gender-differentiated impact and the results are shared at a regional/national forum	The technical assessment takes place sufficiently before the closure of the project so that a regional/national forum can be organized after the assessment
3. A sustainable financing mechanism established for long-term adaptation efforts	Adaptation actions financed and implemented from island level plans (no. and type)	Audited Island accounts Compiled report produced by the ISP officer on the consolidated island-level budgets and use	To date, no adaptation action has been implemented based on Island Strategic Plans	All islands have an ISP with specific budgets for development priorities	At least 16 adaptation priority actions (two in each island), outlined in ISPs, are financed by either domestic or external resources and executed	There is high level commitment and buy-in from officials in the central government and kaupule to revise ISPs and use domestic funds for adaptation purposes; Available domestic funds to outer islands remain viable sources; the role of women's group as a checks-and-
	Women's distinct role in the context of island	Focus group discussions;	Women are only "consulted"	The use of scorecards and	Women's group	

[50] http://fiji.embassy.gov.au/files/suva/120912%20-%20AusAID%20Tuvalu%20awards%20-%20FINAL.DOC
[51] Aid budgeted for scholarships and others http://www.aid.govt.nz/where-we-work/pacific/tuvalu

	decision making established	key informant interviews	during the island decision making process, but no distinct roles are established	participatory video has started	recognized by both men and women as an important interest group in the evaluation of *kaupules*	balances function is not diluted in the small island setting

Activities	**Description**	**Inputs**	**Description**
1.1. Technical capacity, knowledge and awareness of the Government and community strengthened for coastal monitoring, protection and maintenance of coastal protection infrastructure	Strengthened and improved local capacity and inter-sectoral partnership/coordination in identifying, collecting and analyzing data in various aspects of coastal vulnerability.	1.1.1. Training of coastal monitoring workers in outer islands on the use of survey equipment; agreement of contracts including the frequency of data collection and transfer. 1.1.2. Training of DoLS staff on the synthesis and digitization of survey data collected from outer islands. 1.1.3. Training of DoE staff on environmental and social impact assessment 1.1.4. Training of PWD staff members on the structural maintenance of the GCF investments 1.1.5. Training of PWD staff, NGOs, and CSOs on the application of EBA coastal protection 1.1.6. Comprehensive training program designed targeting CCPU staff 1.1.7. Two regional conferences and/or workshop on coastal protection organized	Improved monitoring at island level of coastal change; synthesis and analysis of beach profile data; improved ESIA capacity; improved knowledge and skills for EBA coastal protection; improved skills for maintenance of coastal protection infrastructure; improved coordination and CCA program management capacity for CCPU staff It is estimated that a total of 18 trainings will be organized in the lifetime of the project targeting PWD, DoLS, DoE and CCPU. The total number of individuals to be trained is 12.
1.2. Long-term national human resource capacity and awareness enhanced for sustainable coastal protection	Build and improve technical capacity of Tuvaluans to lead and take ownership in further development, implementation, and sustaining coastal protection measures by the project, as well in the future.	1.2.1. A scholarship program is designed with the MoE; criteria for selecting eligible candidates agreed by the second Project Board meeting 1.2.2. Scholarship agreement made with at least 18 students 1.2.3. At least 6 new graduates are identified and recruited to assist the government in implementing the project and in carrying out coastal vulnerability and environmental and social impact assessment 1.2.4. Contractual agreement signed with the selected 6 students who are in a master's program relevant for coastal protection 1.2.5. Training of trainer events organized specifically targeting school teachers 1.2.6. Primary school curriculum modified and approved	Scholarship program for building future experts for coastal protection targeting high school and university students; professional exposure for students; revision of primary school curriculum.

2.1. Coastal protection design, site-specific assessments and Environmental and Social Impact Assessments undertaken in all islands in a participatory manner	Site-specific assessments in all islands of Tuvalu to inform coastal protection options	2.1.1. Organization of community consultations to inform the design and ESIA. 2.1.2. Collection of wave, current and sediment data, public consultations and ESIA 2.1.3. A national consultation and validation of the findings of the assessment. 2.1.4. Establishment of a permanent survey benchmark engaging youth organizations to carry out surveys	ESIA, site assessments, detail drawings, BoQs, and public consultations for effective, sustainable, gender-responsive coastal protection
2.2. Coastal protection measures implemented	Coastal protection measures installed and monitored in identified sites.	2.2.1. Construction of coastal protection infrastructure in Funafuti, Nanumea and Nanumaga covering 2,210m of vulnerable coastlines 2.2.2. Organization of community consultations for handover of the assets 2.2.3. Engaging youth based organizations to play a role in monitoring on a quarterly basis during and after project implementation	Procurement for construction companies; oversight for timely completion of the construction work
3.1. All Islands Strategic Plans and annual budgets integrate island-specific climate risks through existing gender sensitive, participatory processes	Community members, including men, women, children, and the elderly, empowered to participate in climate resilient planning process of the ISPs, taking into consideration climate change impacts and integrated coastal, land, and marine resource management principles.	3.1.1. National ToT workshop organized for incorporating climate change risks, including coastal management, into ISPs targeting kaupule representatives, minority groups, DRD staff, NGO staff and women's groups. 3.1.2. Facilitation of outer island workshops to integrate climate risks into the existing ISPs and to produce/enhance annual budgets 3.1.3. Compilation, analysis and reporting of all outer island annual budgets 3.1.4. Release of performance-based top-up grants 3.1.5. Operational and financial arrangement finalized for community-based disaster early response/recovery support	Technical assistance throughout the iterative process of planning, budgeting, execution and monitoring for the lifecycle of the project. Two national workshops are expected in the course of the project; from year 2, an island level workshop will be organized once a year in each island to review the new ISP at the beginning of the budget cycle.

3.2. Capacity of Kaupules, Falekaupules and community members strengthened for monitoring coastal adaptation investments	Community capacities to monitor, evaluate and communicate results and impacts of coastal protection adaptation investments enhanced	3.2.1. Outer island level awareness raising events organized targeting different interest groups about monitoring and maintenance needs of the coastal investments (in the island of Funafuti, Nanumea and Nanumaga) and the needs for EBA for all the islands (Following Activity 1.1) 3.2.2. A national Training of Trainers events organized inviting representatives from these interest groups for participatory video. 3.2.3. Technical assistance on the use of community scorecard to assess performance of outer island administrations 3.2.4. National level consultations organized to review the process of annual budgeting, monitoring and evaluation for coastal protection	Strengthening the perception of internal accountability through the continuous use of community scorecard From year 4, island-level workshop to review the execution of ISPs will be organized every other year in each island; participatory video demonstration and review will be organized 5 times in year 4-8.

H.2. Arrangements for Monitoring, Reporting and Evaluation

240. Project-level monitoring and evaluation will be undertaken in compliance with the UNDP POPP and the UNDP Evaluation Policy. The primary responsibility for day-to-day project monitoring and implementation rests with the Project Manager. The Project Manager will develop annual work plans to ensure the efficient implementation of the project. The Project Manager will inform the Project Board and the UNDP Country Office of any delays or difficulties during implementation, including the implementation of the Monitoring & Evaluation (M&E) plan, so that the appropriate support and corrective measures can be adopted. The Project Manager will also ensure that all project staff maintain a high level of transparency, responsibility and accountability in monitoring and reporting project results.

241. The UNDP Country Office will support the Project Manager as needed, including through annual supervision missions. The UNDP Country Office is responsible for complying with UNDP project-level M&E requirements as outlined in the UNDP POPP. Additional M&E, implementation quality assurance, and troubleshooting support will be provided by the UNDP Regional Technical Advisor as needed. The project target groups and stakeholders including the NDA Focal Point will be involved as much as possible in project-level M&E.

242. A project inception workshop will be held after the UNDP project document has been signed by all relevant parties to: a) re-orient project stakeholders to the project strategy and discuss any changes in the overall context that influence project implementation; b) discuss the roles and responsibilities of the project team, including reporting and communication lines and conflict resolution mechanisms; c) review the results framework, re-assess baselines as needed, and discuss reporting, monitoring and evaluation roles and responsibilities and finalize the M&E plan; d) review financial reporting procedures and mandatory requirements, and agree on the arrangements for the annual audit; e) plan and schedule Project Board meetings and finalize the first year annual work plan. The Project Manager will prepare the inception report no later than one month after the inception workshop. The final inception report will be cleared by the UNDP Country Office and the UNDP Regional Technical Adviser, and will be approved by the Project Board.

243. A project implementation report will be prepared for each year of project implementation. The Project Manager, the UNDP Country Office, and the UNDP Regional Technical Advisor will provide objective input to the annual PIR. The Project Manager will ensure that the indicators included in the project results framework are monitored annually well in advance of the PIR submission deadline and will objectively report progress in the Development Objective tab of the PIR. The annual PIR will be shared with the Project Board and other stakeholders. The UNDP Country Office will coordinate the input of the NDA Focal Point and other stakeholders to the PIR. The quality rating of the previous year's PIR will be used to inform the preparation of the next PIR. The final project PIR, along with the terminal evaluation report and corresponding management response, will serve as the final project report package.

244. An independent mid-term review process will be undertaken and the findings and responses outlined in the management response will be incorporated as recommendations for enhanced implementation during the final half of the project's duration. The terms of reference, the review process and the final MTR report will follow the standard templates and guidance available on the UNDP Evaluation Resource Center. The final MTR report will be cleared by the UNDP Country Office and the UNDP Regional Technical Adviser, and will be approved by the Project Board. The final MTR report will be available in English. An independent terminal evaluation (TE) will take place no later than three months prior to operational closure of the project. The terms of reference, the review process and the final TE report will follow the standard templates and guidance available on the UNDP Evaluation Resource Center. The final TE report will be cleared by the UNDP Country Office and the UNDP Regional Technical Adviser, and will be approved by the Project Board. The TE report will be available in English. The UNDP Country Office will include the planned project terminal evaluation in the UNDP Country Office evaluation plan, and will upload the final terminal evaluation report in English and the management response to the public UNDP Evaluation Resource Centre (ERC) (www.erc.undp.org). The MTR and TE will be carried out by an independent evaluator. The evaluation report prepared by the independent evaluator is then quality assessed and rated by the UNDP Independent Evaluation Office.

245. The UNDP Country Office will retain all M&E records for this project for up to seven years after project financial closure in order to support ex-post evaluations. A detailed M&E budget, monitoring plan and evaluation plan will be included in the UNDP project document.

246. Implementation of Output 2 will follow a phased implementation approach. Island-level assessments across all islands will be carried out by a single contractor to ensure consistency in the assessment. The assessments will start from the three targeted islands. Timely contractual arrangement and oversight of the assessment process will be an important indicator to monitor the performance of the project in the early stage of project implementation. Since the assessments and construction will be fully outsourced to an international contractors, the overall monitoring of the project will be on the basis of periodic progress report produced by the contractors.

247. Monitoring of project activities for both Output 1 and 3 will require more careful coordination and planning. Monitoring of progress of capacity building targeting government officers will be done primarily through reports produced by, or in partnership with, respective host departments (DoLS, PWD, DoE and CCPU). Similarly, the progress of scholarship programme will be reported by the Ministry of Education. For monitoring of progress on awareness raising, at the start of the project implementation, a simple questionnaire will be administered to different target groups (parliamentarians, government officers, community, and school children). This is not only to understand different learning needs, but to also obtain baseline information against which the progress will be monitored over time.

248. Progress monitoring on ISP process will use several tools and means of verification. For monitoring of operational progress on capacity building and awareness raising, progress reports produced by the ISP officer will be used. For monitoring of outcome-level progress, information drawn from the actual ISPs, island-level budgets, island audit report, community scorecards, and participatory video report will be synthesized and analysed.

249. UNDP will perform monitoring and reporting throughout the Reporting Period, including semi-annual reporting, in accordance with the AMA and Funded Activity Agreement (FAA). UNDP has country presence and capacity to perform such functions. In the event of any additional post-implementation obligations over and above the AMA, UNDP will discuss and agree these with the GCF Secretariat in in the final year of the project and will prepare a post-implementation monitoring plan and budget for approval by the GCF Board as necessary.

I. Supporting Documents for Funding Proposal

☒ NDA No-objection Letter **Annex I**

☒ Feasibility Study **Annex II**

☐ Integrated Financial Model that provides sensitivity analysis of critical elements **Annex III** ***Not Applicable for this project***

☒ Confirmation letter or letter of commitment for co-financing commitment **Annex IV**

☒ Term Sheet (including cost/budget breakdown, disbursement schedule, etc.) **Annex V (a)**

☒ Confirmation as per AMA **Annex V (b)**

☒ Environmental and Social Impact Assessment (ESIA) or Environmental and Social Management Plan
Social and Environmental Screening Template **Annex VI (a)**
Environmental and Social Management Plan **Annex VI (b)**

☒ Appraisal Report or Due Diligence Report with recommendations **Annex VII**

☒ Evaluation Report of the baseline project **Annex VIII**

☒ Map indicating the location of the project/programme **Annex IX**

☒ Timetable of project/programme implementation **Annex X**

☒ Project/Programme confirmation **Annex XI**

Additional information

☒ Economic Analysis **Annex XII (a), Annex XII (b)**

☒ Additional Background Details **Annex XIII**

☒ Responses to GCF comments on Proposal **Annex XIV**

☒ Letter of Endorsement from UNDP Senior Management **Annex XV**

** Please note that a funding proposal will be considered complete only upon receipt of all the applicable supporting documents.*