Government of Tuvalu

United Nations Development Programme

PROJECT DOCUMENT

UNDAF Outcome(s):	4.0 Sustainable Environmental Management
Expected CP Outcome(s):	4.2 Tuvalu communities effectively manage and sustainably use their environment as well as their natural and cultural resources
Expected CPAP Output(s):	4.2.1 Improved and supported adaptive capacity at all levels that contribute to the protection of marine, land, water resources and environmental services
Implementing Partner:	Ministry of Natural Resources and Environment (MNRE)
Responsible Parties:	United Nations Development Program

Programme Period: 2008-2012 **CPAP Programme Component:** Outcome 4.2.1.1 **Project Title:** Increasing Resilience of Coastal Areas and Community Settlements to Climate Change in Tuvalu **Award/Project ID:** 00058214 / 00072222 (FJI10) **Start date:** November 2009 **End date:** November 2013 (4 years) **PAC Meeting date:** July 2009	**Total budget:** USD 7,800,000 **LDCF (GEF):** USD 3,300,000 **Parallel co-financing:** USD 4,170,000 **Government (in kind):** USD 330,000

Agreed by Implementing Partner (Ministry of Natural Resources and Environment):

Ministry of Finance and Economic Planning):

Agreed by UNDP:

Date: *25th November 2009*

Government of Tuvalu
United Nations Development Programme

PIMS No. 4163
Increasing Resilience of Coastal Areas and Community Settlements to Climate Change in Tuvalu

Brief description

Tuvalu is experiencing increasing climate change-induced damage to human and economic development, with adverse effects already experienced by its small and dispersed communities living in highly vulnerable, low-lying atoll islands. There is a high risk of further climate-change related damage including irreversible loss of habitable areas of the country. Tuvalu's natural resource base and livelihood opportunities of its communities are seriously undermined by the combined effects of sea-level rise, increased frequency and intensity of tropical cyclones, rapidly progressing coastal erosion, increasing crop damage, and reductions of fresh water supply.

Through this initiative, the Government of Tuvalu aims to strengthen institutional capacities to identify and address climate change-driven events that systematically increase the vulnerability of island communities. LDCF resources will be used to to increase the protection of livelihoods in island communities from dynamic climate-related damage in all islands (Funafuti, Nanumaea, Nanumaga, Niulakita, Niutao, Nui, Nukufetau, Nukulaelae, and Vaitupu), based on the following closely interrelated components:

a. Increasing institutional capacity at all levels of public administration, island kaupules and communities, with policy support to plan for and respond/adapt to climate change-related damage:
- Integrating climate resilience into coastal management, public works, agriculture and water sector policies and plans including the Te Kakeega II (National Development Plan), with corresponding public sector budgets and asset management plans
- Training for government officials on policy, budgeting, and planning needs to cope with climate change and awareness-raising for households in vulnerable communities on effective community-based adaptation responses to ensure that adaptation is adequately resourced and supported by government and effectively implemented by communities
- Strengthening climate change coordination among key line ministries by establishing a National Climate Change Advisory Board

b. Implementing community-based adaptation measures
- Technical Assessments of each island (coastal erosion dynamics in the context of climate change, identification and adaptation of feasible techniques for coastal protection including tree-planting and 'soft' technologies, salt- and drought-tolerant crop production linked with water conservation measures, etc.)
- At the island and community levels, integration of climate change into the Island Development Plans, through comprehensive adaptation plans and targeted training
- Implementation of community-based adaptation demonstration projects for climate-resilient coastal protection, crop production and water resources use in each island

c. Knowledge capturing, management, and dissemination

Systematic documentation, analysis and applying of lessons learnt from the policy processes, technical assessments and adaptation plans, community engagement and especially the application of demonstration adaptation measures in all islands of Tuvalu to the planning and implementation of additional adaptation projects to counter the increasingly damaging effects of climate change.

This initiative will be implemented through the active engagement of all relevant line ministries and departments (Environment, Home Affairs, Agriculture, Fisheries, Finance and Public Works), ensuring cross-sectoral coordination throughout the policy-making, capacity building and implementation activities. The community-level implementation will be delivered through the engagement of island Kaupules, and with the support of national NGOs (such as TANGO and the National Council of Women). The involvement of CROP agencies (such as SOPAC, SPC) will provide regional expertise on the technical aspects of the initiative.

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Acronyms

ALM	Adaptation Learning Mechanism
APF	Adaptation Policy Framework
APR	Annual Project Report
AusAID	Australian Agency for International Development
AWP	Annual Work Plan
CAE	Country Assistance Evaluation
CBA	Community-Based Adaptation
CBOs	Community-Based Organizations
CCC	Climate Change Cell
CDMP	Comprehensive Disaster Management Program
CO	Country Office
CRA	Community Risk Assessment
CSOs	Civil Society Organizations
DoA	Department of Agriculture
DoE	Department of Environment (Ministry of Natural Resources and Environment)
DoF	Department of Fisheries
DoLS	Department of Land and Survey
EA	Executing Agency
EU	European Union
GEF	Global Environment Facility
GOT	Government of Tuvalu
IA	Implementing Agency
INC	Initial National Communication
IPCC	Inter-governmental Panel on Climate Change
IWRM	Integrated Water Resource Management
JICA	Japan International Cooperation Agency
LDCF	Least Developed Country Fund
LDCs	Least Developed Countries
M&E	Monitoring & Evaluation
MDG	Millennium Development Goal
MNRE	Ministry of Natural Resources and Environment
MOE	Ministry of Education
MOH	Ministry of Health
MPUI	Ministry of Public Utilities and Infrastructure
NAPA	National Adaptation Program of Action
NGOs	Non-Governmental Organizations
OECD	Organization for Economic Co-operation and Development
PIR	Project Implementation Review
PPG	Project Preparation Grant
PWD	Public Works Department
RCU	Regional Coordinating Unit
RRAP	Risk Reduction Action Plan
SGP	Small Grants Program
SLR	Sea Level Rise

SNC	Second National Communication
SOPAC	South Pacific Applied Geoscience commission
SPC	Secretariat of the Pacific Communities
TANGO	Tuvalu Association of Non Government Organisations
TNCW	Tuvalu National Council of Women
TPR	Tripartite Review
TTPR	Terminal Tripartite Review
UNDP	United National Development Program
UNFCCC	United Nations Framework Convention on Climate Change
USP	University of the South Pacific
WB	World Bank

SECTION I: ELABORATION OF THE NARRATIVE

PART I: Situation Analysis

Problem Statement

1. Tuvalu has already suffered severe damage to its habitable coastal areas and productive base due to climate change and faces extreme vulnerability to further damage due to its very limited land area, low-lying topography, geographic location that is unstable meteorologically and prone to extreme storm events and droughts. The country's small and dispersed population is highly dependent on fragile marine and terrestrial environments for sustenance. Given the small islands, communities live in close proximity to the coastal zone, and are therefore especially vulnerable to the direct effects of climate change, including increased frequency and severity of storms, sea level rise, salinity in cultivated areas, and coastline erosion.

2. The leading vulnerabilities and their effects include:

- **Sea Level Rise** in coastal areas means the sea is increasingly encroaching higher ground on already eroded and vulnerable coastline. This dynamic increases the coastal area subjected to coastal erosion and flooding.

- Tuvalu's land area is becoming smaller. In recent years, the country has lost a considerable but to date unmeasured land area due to **erosion.** At its widest point, Tuvalu only spans about 200 meters, so any rise in sea level is cause for urgent concern. From 1993-1999, the average sea level rise was 22 mm per year, a rate which is expected to increase in the future.

- **Saltwater Intrusion** - rising sea level and the porous soils of atoll islands create the ideal conditions for inland intrusion of saltwater, and the increasing salinity of groundwater lenses.

- **Inundation -** rising sea level pushes water closer to the land surface resulting in upwelling at low lying areas across the islands and high frequency of inundation at pulaka pits. In February 2004 and again in February 2006, king tides flooded homes and 40% of the tar-sealed airstrip in Funafuti. While king tides did occur occasionally in the past, they now occur nearly every year and cause major damage to pit grown root crops and bananas, the major staples in Tuvalu.

- **Drought -** increasing frequency of ENSO-associated erratic rainfall and low rainfall lead to household water shortages and increasing stress on groundwater lenses, affecting all biomes depending on groundwater resources.

- **Dry periods** are more common in the northern islands than the southern and occur between April and October. The atolls have poor soils that support only coconuts, breadfruit, pandanus, taro, pulaka and a few vegetables and fruits. Drinking water and

other household water supply is mainly from external tanks, which store rainwater collected from corrugated iron roofs.

- **Cyclones -** severe destruction of vegetation, crops and humans from strong tropical cyclone wind force, and flooding that increases breeding areas for vector-borne diseases. There is evidence that the level of cyclone risk in Tuvalu is increasing: Tuvalu was hit by an average of only 3 cyclones per decade between the 1940s and the 1970s, but eight occurred in the 1980s (Nunn, P. D., 1990) and at least ten were experienced in the 1990s.

- Tuvalu is frequently hit by **storm surges** associated with cyclones. Coincidence of high tides and a storm surge event can result in waves washing over low sections of the atolls and disrupting road access, increasing soil salinity, contaminating groundwater, and accelerating coastal erosion processes. There is evidence that maximum wave heights are increasing and projections of future conditions under climate change suggest that maximum wave heights will continue to increase. This suggests that storm surges may become more serious and possibly more frequent, thus causing increased damages.

- **Rising sea surface temperatures** - continue to affect coral bleaching, decreasing productivity of near shore coral reef ecosystems, and inshore fisheries.

- Increasing **heat stress** on humans, plants and animals.

Root Causes of the Vulnerability and Barriers to Climate Resilience

3. While climate change in Tuvalu cannot be avoided, the threat that climate change poses to the country in terms of adverse impacts consists, at its root, of the limited awareness among civil society and public officials alike about how the climate is changing, what danger this poses to lifestyles and livelihoods, and what, in practical terms, can be done about it. At the national level, there is little integrated coastal zone management policy incorporating climate resilience that can guide coastal communities in their infrastructure planning and housing decisions, as well as in land use practices in a way that reduces their vulnerability to climate change. There is little information exchange among coastal communities facing similar problems and between coastal communities and the national government that would provide a sustained source of heightened community awareness, consideration of practical adaptive solutions, avoidance of past mistakes and ability to capitalise on successes. Fundamentally, the country needs to be "knit together" better through a concerted effort to strengthen public policy to guide climate-aware development in coastal areas, organise communities effectively to recognise and confront their vulnerabilities, and channel resources to help the communities to implement community-based solutions.

4. Although there is a range of projects underway in Tuvalu that have relevance to building adaptive capacity in the coming decades, many of them have not been designed with long-term climate change in mind. The institutional and human capacities at different levels to assess climate information, and to develop and implement climate change

adaptation interventions are still in their early stages of development. Future changes in the climatic system and related risks are not explicitly reflected in the policies and strategies that influence coastal development. The lack of climate risk assessment in relevant policies (e.g., environment and coastal zone management) and programmes is a major constraint to achieving and sustaining MDGs. This is due in part to the fact that climate change concerns are relatively new, as well as lack of capacity to address a recognized deficiency in the policy and institutional environment. An integrated framework and targeted capacity building for assessing, planning, implementing, monitoring, and evaluating climate change risks in coastal areas and community settlements is urgently needed.

5. Based on current legislation, there appears to a range of institutional mandates to address aspects of climate change and coastal zone management throughout government. However, it appears that institutions involved in addressing these issues, despite a high level of commitment from those concerned, lack sufficient capacity and resources for sustained focus and effort on current issues. The loss of personnel previously involved in the NAPA process demonstrates how difficult it is to retain well-trained, knowledgeable and expert staff. The high turnover of qualified staff is a common issue throughout the Pacific.

6. The current approach to climate change by the Government is largely on a sectoral basis. Primary responsibility rests with the Department of the Environment which liaises with other Departments and organizations, e.g. Fisheries, Agriculture, as required. In common with other agencies of government, the Department of Environment has extremely limited resources and is currently unable to deal effectively with many of the climate change issues that arise. Elsewhere within government there appears to be limited capacity to deal with climate change related issues. The Public Works Department, normally responsible for engineering responses to climate change, such as construction of protective structures or provision of water tanks, is understaffed and financially overstretched and unable to commit resources to new programs or initiatives.

7. The Lands and Survey Department have a role in strategic monitoring of some climate change issues, e.g., coastal erosion, but do not have adequate resources for ongoing monitoring, including routine purchase and analysis of satellite imagery. (The current institutional relationships within the national government that are relevant to climate change and coastal zone management are outlined in Annex 3.)

8. Tuvalu has limited environmental law in place to guide the appropriate treatment and protection of the environment, or to control the degradation of the environment. However, Tuvalu's Environment Protection Act (2007) was recently introduced and provides some basis for developing the framework and mechanisms necessary for responding to climate change. Section 29 of the Act establishes the basis for strategies, programs and regulations specifically designed to address climate change in Tuvalu.

9. The key institutional gaps in Tuvalu's efforts to adapt to climate change currently are: (i) human resources in all relevant departments; (ii) financial resources for implementation of programs and projects; and (iii) specific legislative and regulatory instruments along

with the necessary technical capacity and resources to support programs and projects; (iv) lack of coastal management programs that recognize the integrated nature of climate change impacts; and (v) lack of coordination between the line ministries and departments and the island-level Kaupules representing communities for the implementation of adaptation measures. For Tuvalu to adapt successfully to climate change, a comprehensive plan and sufficient resources to implement it over the long term are required, together with a very substantial long term political, social, and economic commitment.

10. While climate change has not been integrated into the National Development Plan (Te Kakeega II), and the recently established Island Development Plans, and policies relating to climate change have not yet been consolidated into a specific national climate change policy, the Department of Environment is using the NAPA as the main living document for climate-related issues. The Government, through the Ministry for Natural Resources and Environment has developed several climate change related initiatives (e.g., the NAPA itself and the Initial Communication on Climate Change, a blueprint submitted by the Government to the Secretariat of the COP14).

11. The Environment Protection Act 2007 provides a framework for environmental conservation, protection and management, including climate change adaptation and mitigation, environmental impact assessment, biodiversity conservation, and management of solid, liquid and chemical wastes.

12. Further details describing Tuvalu's baseline vulnerabilities, policy framework, and institutional capacities are contained in Annexes 2, 3, and 4.

Normative Situation

13. Countering the damaging effects of climate change in Tuvalu in the long term requires full government capacity to design, implement, evaluate, and replicate effective community-based adaptation projects. The process of community-based adaptation implementation and climate-resilient policy formulation strengthens the capacity of communities, planners, and NGOs to share information and experience and effectively deal with the risk of cyclones, sea level rise, salinization, and other climate change impacts. Specifically, effective capacity to deal with climate change in Tuvalu includes:

- Integrated adaptation measures that demonstrate effectiveness in introducing, safeguarding, and sustaining coastal erosion protection (soft technology and tree planting), crop production and water conservation techniques in all islands, supported by an ability of households to pursue livelihood strategies that help to build and safeguard such integrated systems.
- Planning and replication of effective adaptation measures in other vulnerable coastal areas in Tuvalu (and overseas), resulting in growing momentum of adaptation implementation in all islands over time. Proposed or ongoing programs related to coastal development incorporate lessons learned through adaptation, paving the way for upscaling of the community-based adaptation measures.

- Climate change considerations are mainstreamed at all levels and adaptation measures are effectively coordinated across national and local institutions. Community participation in the design and implementation of community-based adaptation promotes sustainability and strong interest among households in pursuing climate-resilient livelihoods.
- Capacity is sufficient among national and local coastal development planners in the MNRE, PWD, Agriculture, and Fisheries Departments to identify climate risks and to prioritize, plan, and implement measures for adaptation in target areas.
- National policies and action plans on coastal management and land use promote sustainable, climate-resilient development. Adaptation experience is incorporated into climate-resilient national strategies, including coastal land use policy. Careful monitoring of project performance, efficiency, cost-effectiveness, and sustainability is applied to develop similar projects in the future.

Outcomes/Outputs

14. Adaptation to climate change related risks at the communal level under the project will reduce the costs associated with climate-induced damage on coastal zones and island communities over time. In this context, the Tuvalu NAPA top three priorities aimed at "increasing the resilience of coastal areas and community settlements to climate change throughout Tuvalu", "increasing subsistence pit grown pulaka productivity", and "adaptation to frequent water shortages"[1] provide a compelling argument that risk reduction in coastal areas can only be achieved through fostering community awareness and self-reliance through community-based adaptation measures that enhance and diversify livelihoods.

15. The project is designed to develop capacity in the MNRE and the MPUI at the national level and in each island Kaupule in Tuvalu to incorporate climate resiliency into coastal zone management and planning, government budgeting for infrastructure investment and maintenance, and planning and priorisation of current and future projects in the islands; provide training to communities and island kaupule on the design and implementation of effective community-based adaptation to counter the encroaching damage of climate change; build active civil society networks and organise communities to ensure cooperative community action and exchange of needed information on adaptation measures that work and pitfalls to be avoided; build and strengthen linkages among communities, NGOs, the kaupule, and the national government to ensure that adaptation progresses as a truly national effort in which all levels of society play key parts; and provide resources for priority community-based adaptation demonstration projects that will protect communities and provide the public sector and the communities with a base of experience from which to draw lessons and capitalise on successes through replication. The project is designed to catalyse and build momentum in the pace of adaptation planning and implementation into the long term.

[1] Tuvalu NAPA, pg 7

16. The proposed project addresses three key closely inter-linked priorities of the Tuvalu NAPA and outlines an integrated adaptation approach comprising of the following:

- Enhancing adaptive capacity of local communities to anticipate dynamic climate-related threats and protect their livelihoods through priority community-led adaptation interventions that focus on mangrove afforestation and other soft coastal protection measures, improved fresh water storage, and piloting drought- and saline-resistant local agriculture;
- Ensuring that Tuvalu's coastal zone management policy framework is effectively integrating climate change resilience, with a view to facilitating climate-resilient investment and land-use in vulnerable coastal zones and island communities;
- Increasing the individual, institutional and networking capacity at the national and local levels of public administration (MNRE, MPUI, and island kaupule) and NGOs to understand climate change risks in coastal areas, anticipate climate risk dynamics and prioritize and implement appropriate climate risk reduction measures;
- Capturing and disseminating lessons learnt and best practices from pilot activities, capacity development initiatives, and policy changes to all community, national and international stakeholders (such as those implementing community-based adaptation measures in other countries) and development partners, thus promoting the sharing of project knowledge both within Tuvalu and with other countries.

17. Tuvalu is building experience in community-based livelihoods interventions, community-based disaster management projects, and public health protection projects and is well positioned to build on these capacities to integrate the impacts and risks posed by climate change. The institutional mechanisms required to support adaptation in coastal communities will be enhanced through the proposed project.

18. This project will facilitate the development of adaptive capacity at various levels. Most importantly, the project will develop the capacity of community-based organisations and specifically vulnerable population groups to internalize climate risk management in island livelihoods. At the national level, institutional coordination will be streamlined, information flows will be analysed and improved and policy support targeted at national decision makers will be provided to ensure incorporation of an anticipatory climate change resilience dimension into national policies that regulate development and environmental protection in coastal zones. The project will also strengthen existing institutional structures at the local level (kaupule and community training centres) and complement the existing knowledge-management mechanism between national agencies and communities to facilitate community-based adaptation.

Context

19. Climate changes in Tuvalu comprise increasing variability in occurrence and intensity of extreme weather events, and more gradual and long-term climatic change. Tropical cyclones appear to have increased in frequency in Tuvalu. The most recent severe event

was cyclone Percy (March, 2005); ENSO events have been experienced with greater frequency over the last two decades; sea level is rising, with some structures built in the last 100 years becoming submerged, and some families evacuated due to flooding from king-tide inundation of low-lying areas (first experienced in Funafuti in 2006). The extent of projected increments in sea-level, temperature, and changes in precipitation were established during the NAPA process climate change assessments, where observed long-term temperature changes within Tuvalu suggest an increase of 0.5-2.2^{o}C by 2050 and of 0.9-4.5^{o}C by 2100. The level of the sea around Tuvalu is currently projected to rise between 14 and 88 cm by 2100 whereas at the same time a significant increasing trend in the cyclone frequency is being observed. These scientific assessments confirm that Tuvalu faces a multitude of adverse climate impacts including reduction of fresh water availability in coastal communities, reduced protective functions of coastal ecosystems, acceleration of destructive geomorphologic processes, and increased human and material losses resulting from more intense storm surges, droughts and floods.

20. Climate change exerted pressures, and development of community resilience in coastal areas and islands of Tuvalu are complicated by a range of non-climatic factors. Vulnerability has increased due to anthropogenic activities such as destruction of mangroves by encroaching habitation, thereby reducing natural protective barriers to coastline erosion and inundation. Sand mining activities along the coastline have led to the shifting and/or degradation of coastal morphological dynamics thereby undermining their effectiveness as physical barriers against flooding. The continuous increase in soil and water salinity (due to sea level rise and receding coastlines resulting from erosion) contributes to the further degradation of natural defences and undermines livelihoods.

21. The coastal zones of the Islands of Tuvalu are exposed to extensive erosion, and this has progressed to the point that some infrastructure and buildings are near collapse. The severity of coastal erosion depends on the strength of coastal currents and sediments at the sea/land interface; the coastal currents are normally strong between islets, exacerbated by human-induced coastal degradation as mentioned above. The narrowing of channels between islets due to erosion on atoll islets further increases the channel's coastal current force flow, thus leading to more erosion on adjacent islets and islets and lands. In addition, salt water intrusion threatens the security of fresh water supplies and damages crops and livelihoods. Sea level rise plays a key role in both coastal erosion and salt water intrusion. Coastal areas and human settlements are prone to extreme events such as strong winds from storms, cyclones, and tidal surges which damage buildings and infrastructure, contaminate water supplies, and destroy cultivated areas. The frequency of tropical storms and associated surges are projected to increase as a consequence of climate change.

22. The construction of coastal defences and the planting of green belts along coastlines play a vital role in stabilizing shorelines and protection to coastal communities against cyclones and tidal surges. Recent experiences with coastal erosion have shown that local ideep-rooted, salt-tolerant tree species can substantially reduce coastal erosion on stony coastlines. Placement of channel current breaker structures within the channels between islets and other locations of strong coastal current flow will dissipate coastal current force and this will further reduce erosion. It is evident that mangroves and salt-tolerant non-

mangrove species can mitigate or reduce risk of natural disasters such as cyclones[2], and will be planted wherever shoreline geological conditions are appropriate. Past experience shows that hard structures do not provide ideal solutions and disintegrate over a mid-term period. Therefore, soft engineering solutions will be required where planting mangroves or other species is not feasible, such as reef flats or beaches with insufficient sediment for mangroves. Initiating and maintaining such plantations and soft engineering solutions with community participation can create sustained livelihood opportunities. Effective engagement of communities for management of coastal protection is necessary to deliver permanent protection from natural disasters.

23. In addition, the introduction of salt-tolerant food crops (e.g., pulaka) and other means to support agriculture (including storing more fresh water for human and livestock consumption) will be increasingly required to sustain local food production. Increasing salinity of the groundwater in most islands has damaged crops, and capacity to manage and store fresh water on the islands to replace groundwater for agriculture and for domestic use during droughts is becoming increasingly inadequate to sustain life.

24. NIWA has reported (in SPREP 1999) that a measurable change has occurred in the Pacific's climate from the 1970s, and Tuvalu has become drier and sunnier. Average air temperatures in Tuvalu have increased with high humidity, increasing the heat stress on the people, plants, animals and other living organisms. Evaporation has reduced soil moisture to levels that affect plant growth. With rising temperatures, Tuvalu is also experiencing a higher occurrence of severe drought, associated with an increasing frequency of El Nino events in the Pacific. In the current decade, increasing climate variability and extreme events are also manifest in tropical cyclones and frequent inundation of low lying and coastal areas. These are adversely affecting domestic agricultural productivity, freshwater availability, and community livelihoods.

25. Stakeholders from the outer islands have reported saltwater intrusion into taro (pulaka) pits and overtopping waves. Coastal erosion is evident on all the islands of Tuvalu, quickened by sea level rise. However, coastal erosion is exacerbated also by human excavation of coastal aggregates for construction purposes. In addition, coastal development infrastructure such as ramps sometimes disturbs natural current patterns and hastens coastal erosion in certain areas.

26. Whilst the growing population of Tuvalu is placing pressure on sensitive environments and sources of food security and livelihoods, these effects are exacerbated by climate and sea level changes and extreme events. Though there is a lack of detailed baseline information on which to assess the impact of climate change under realistic scenarios in Tuvalu, alarming signs of adverse impacts are already evident in the form of inundations, crop failures, and a rising incidence of human disease from water-borne vectors.

[2] Mazda, Y., Magi, M., Kogo, M., Hong, P.N., 1997. Mangrove on coastal protection from waves in the Tong King Delta, Vietnam. *Mangroves and Salt Marshes* 1, 127-135.

Figure 1: Map of the Islands of Tuvalu

27. All islands in Tuvalu are extremely low-lying (3 m or less geographical elevation above mean sea level). About one-third of the working-age population in the outer islands engage in subsistence activities (fishing, agriculture, and handicrafts), compared to only about 6 percent on Funafuti.[3] Human sustenance in the outer islands is heavily dependent on subsistence production. Of all of the fishing, agriculture, and handicrafts activities in the outer islands, the great majority are conducted strictly for subsistence (own-consumption) whereas in Funafuti, where there are relatively well-developed markets, such activities are mostly for cash sale. Almost half of the cash incomes available to households in the outer islands is derived from wages (largely from formal employment in the public sector), and a further 25% is derived from cash remittances from overseas and elsewhere in Tuvalu, as shown in Table 1 below.

[3] *Tuvalu 2002 Population and Housing Census*, Vol 1, Analytic Report, Secretariat of the Pacific Community, 2005

Table 1: Main Sources of Household Income (%)

Income sources	Tuvalu	Funafuti	Outer Islands
No income	6.20	3.00	8.40
Wages	59.10	76.50	47.10
Own business	5.40	7.80	3.70
Sale of fish/ handicrafts/ agricultural produce	9.10	4.20	12.40
Remittances	18.10	7.00	25.70
Other	2.20	1.40	2.70

Dependency is relatively high in the outer islands. The dependency ratio (defined as the proportion of the population under 14 years of age or over 60, to the working-age population (between 15 and 59 years of age) – i.e., the proportion of people dependent upon the working age population for livelihood and life support – is 90.2 percent in the outer islands, compared to about 72 percent in Funafuti.Due to chronically economically depressed conditions in the outer islands, the populations in the majority of the outer islands (with the exceptions of Vaitupu and Nukulaelae) have been declining since 1991, as shown in Table 2 below.[4]

Table 2: Population Changes between 1991 and 2002, by Island

Island	Area (km^2)	Total Population		Population Change (1991-2002)			Pop Dist (%)	Density (persons/ km^2)
		1991	2002	Total	(%)	AAGR *(%)	2002	
Funafuti	**2.79**	**3,839**	**4,492**	**653**	**17.0**	**1.4**	**47.0**	**1,610**
OuterIslands	**22.84**	**5,204**	**5,069**	**-135**	**-2.6**	**-0.2**	**53.0**	**222**
Nanumea	3.87	824	664	-160	-19.4	-1.9	6.9	172
Nanumaga	2.78	644	589	-55	-8.5	-0.8	6.2	212
Niutao	2.53	749	663	-86	-11.5	-1.1	6.9	262
Nui	2.83	606	548	-58	-9.6	-0.9	5.7	194
Vaitupu	5.60	1,202	1,591	389	32.4	2.6	16.6	284
Nukufetau	2.99	751	586	-165	-22.0	-2.2	6.1	196
Nukulaelae	1.82	353	393	40	11.3	1.0	4.1	216
Niulakita	0.42	75	35	-40	-53.3	-6.7	0.4	83
Tuvalu	**25.63**	**9,043**	**9,561**	**518**	**5.7**	**0.5**	**100**	**373**

* Average Annual Growth Rate

[4] Ibid.

28. Because of its small and isolated population, limited base of livelihoods, and low-lying physical characteristics, Tuvalu is one of the most vulnerable countries in the world to future climate and sea-level change and extreme events.

29. As described above, global climate model results suggest an increase in ground temperatures in Tuvalu of 0.5-2.2^{o}C by 2050 and of 0.9-4.5^{o}C by 2100. Concerning rainfall, model results so far available are not definitive on whether Tuvalu's climate will become wetter of drier in coming decades. Similarly, current model results have not yet been produced to be able to project changes in sea level at a regional scale of direct relevance to Tuvalu. However, estimates derived from the IPCC emission scenarios, IS92a (best guess) and IS92e (high), indicate a 68% probability that the rate of long-term relative sea level change at Funafuti will be between 0.4 and 2.0 mm/year

30. Tuvalu is highly vulnerable to cyclones, coastal flooding and inundation, drought and sea level rise, moderately vulnerable to storm surge and least vulnerable to earthquake and landslides (McKenzie, E. 2005). Given the low elevation and limited land area of Tuvalu, the most direct and severe effect of climate and sea level change will be an increasing risks of coastal erosion, flooding and inundation. The magnitude of such effects will be influenced, in a mutually reinforcing feedback, by climate change impacts on coral reef ecosystems, which is the islands' first natural defence against waves.

PART II: Strategy

31. The project uses a closely inter-linked approach of the following three components to increase the resilience of coastal areas and community settlements to climate change, as illustrated overleaf in Figure 2:

(i) **Implementation of Community-based Adaptation Projects:**

32. The adaptive capacity of local communities to counter damaging climate-related impacts and protect their livelihoods will be substantially increased through the implementation of a number of immediate and pressing community-based adaptation demonstration projects that were identified by the island kaupules during the preparatory phase consultations, including 'greenbelt' coastal protection projects and other soft measures, water supply security enhancement projects, and means to sustain productivity in local cultivation of pulaka (taro) and other staples. Implementation of community-based adaptation projects will be supported by detailed and island-specific technical assessments of coastal erosion dynamics, identification of optimal plantation and 'soft' technologies for coastal protection, and agricultural suitability of salt-tolerant species (other technical assessments may be carried out as required by local circumstances). Comprehensive island-specific adaptation plans will be developed early in the project for each island. Community-based adaptation measures at the local level will help sustain livelihoods, strengthen natural barriers against climate change-induced inundation and erosion, improve the security of food and water supplies and facilitate the flow of climate-related information.

(ii) **Climate-resilient Policy Development and Capacity Building**

33. Individual, institutional and systemic capacity will be strengthened at public administration, Island Kaupules, community mebers and among relevant NGOs to plan for climate change risks in coastal areas and implement effective adaptation measures. Institutional capacity will be strengthened to incorporate climate risk reduction into coastal zone development and management at the national and island levels. Policy will be developed or strengthened to guide climate-resilient development in coastal areas, related agriculture and water sector policies, and budget processes and development plans will incorporate climate resiliency. The establishment of a National Climate Change Advisory Board will enhance inter-ministerial coordination for high-level policy guidance in climate change matters as a permanent body.

(iii) **Knowledge Capturing, Management, and Dissemination**

34. Lessons learned and knowledge gained from the demonstration adaptation activities, island-specific technical assessments and adaptation plans, community engagement processes, capacity development initiatives, and policy changes will be systematically captured, analysed and disseminated to key government planners, kaupule representatives, communities, civil society and development partners, in order to help build long term momentum for community-based adaptation throughout Tuvalu. Knowledge gained will be shared through the UNDP Adaptation Learning Mechanism and the regional Pacific Adaptation to Climate Change (PACC) project to assist countries faced with similar threats in coastal communities successfully adapt to climate change.

35. Policy development and related capacity building and coordination are needed to create a supportive environment for the implementation of community-level adaptation measures and, in turn, need to be informed by the grass-root level experience. The top-down and bottom-up approaches are linked with both national and community level work in close interaction. Capturing and documenting good practices and lessons learned is similarly important from the early stages of project: capturing and applying lessons from the assessment, community engagement, and adaptation planning stages, through the implementation and evaluation of measures will create a body of practical knowledge that will help sustain the adaptation measures and replicate them in the future, and will become a valuable resource for future professionals and community members.

36. Community participation in managing coastal plantations and a long-term agreement between the government and the communities is essential to reduce vulnerability and protect settlements. Enhancing existing livelihood options through support to agriculture via water supply improvements, introduction of salt-tolerant crop species, and improved cultivation practices (and parallel management of inshore fisheries to maintain yields) will sustain income sources to complement the protection of island ecosystems afforded by the coastal protection projects. Such an increase in the sustainability of coastal buffer zones and livelihood options of coastal communities requires an accompanying amendment of coastal zone policies, as well as strengthened institutional capacity in national government departments.

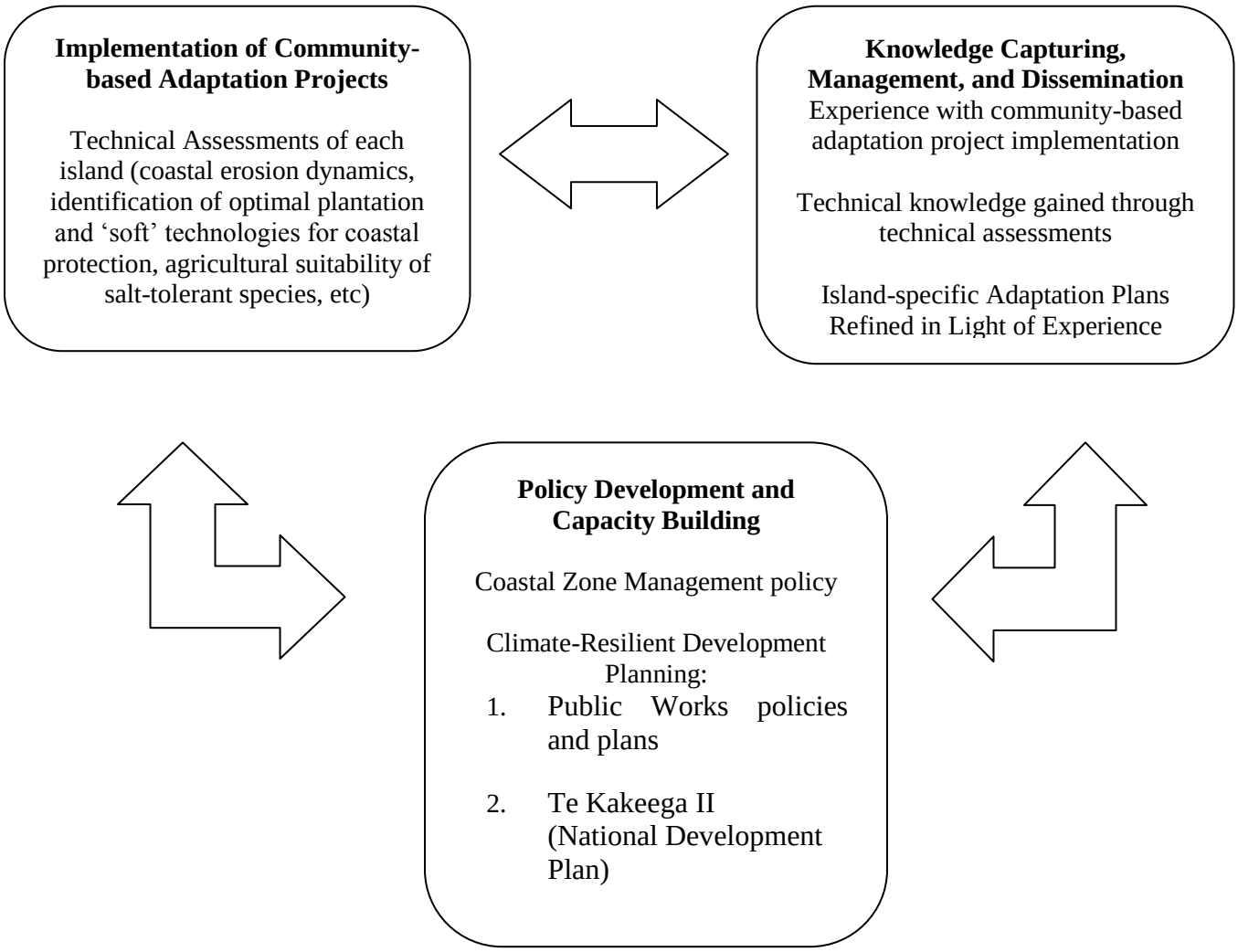
37. The island adaptation demonstration projects were identified by island kaupule representatives and government stakeholders through the PPG consultations, and are indicative. Projects and resource allocations may be modified to suit current priorities after the project commences (during inception phase), or adjusted to accommodate new developments, needs, and possibilities. All adaptation demonstration projects will be supported through project-supplied technical expertise (technical advice, coordination support), capacity building activities (technical training), and other project support. A chart on Professional inputs to the project is provided in Annex 6.

38. The project will undertake island- and site-specific assessments (for example, study erosion and sediment patterns, saline intrusion levels and locations, water volumes and uses, distribution and shortages, etc.), island-level adaptation plans (addressing community needs in an integrated way and linked with the recent Island Development Plans), targeted technical training (e.g., methods of starting and maintaining coastal plantations, install and maintain ‘soft’ coastal protection options, cultivate salt-tolerant pulaka, etc.), feasibility studies for the optimal implementation of practical adaptation measures (with reference to cost effectiveness, materials, socio-cultural issues, maintenance) tailored to each of the atolls and pilot communities.

39. Through participatory processes, the technical expert team will undertake thorough consultations with communities to identify and put in place coastal protection measures that are optimal and feasible environmentally, socially, and economically for the communities concerned; introduce the most appropriate salt-tolerant species and cultivation techniques for agriculture; and introduce solutions for water management.

40. In the project's inception phase, the project strategic results framework, management arrangements, budget, and other aspects will be reviewed and, as necessary, adjusted to fit new developments or priorities.

Figure 2: Interrelationship of the Three Primary Project Components



Project Rationale, Policy Conformity, and Linkages with Parallel Initiatives

41. The project is aligned with the development priorities of the Government of Tuvalu as set out in **Te Kakeega II** (National Development Plan). This policy is committed to the realization of the MDGs, in particular to: Improving the quality of life for every Tuvaluan; Providing the enabling environment for employment and private sector development; Strengthening human capacity and ensuring sustainable development and conservation of Tuvalu's natural resources and protection of the environment.

42. The integration of climate change adaptation into sectoral policies, programs and development projects is vital and requires increasing the awareness of stakeholders at all levels of society. It is important that climate change impacts are incorporated into national development plans, especially plans and programs for the most climate sensitive sectors such as water supply, coastal zones, agriculture, disaster mitigation, etc. A broad interdisciplinary and multiple sector approach to integrated coastal zone management and climate change adaption is possible through implementation of the provisions of the **Environment Protection Act**, e.g the policy, program, and regulatory provisions of section 29.

43. There are examples in Tuvalu of benefits of engagement and empowerment of local communities for effective adaptation, for example tree nursery and planting programs. A Poverty-Environment Partnership report on poverty and climate change highlighted that for adaptation to be effective, it is especially important to empower civil society to participate in the assessment of risks and the design and implementation of adaptation activities.[5] Community-based adaptation to climate change, for example through the SPA-funded **Community-Based Adaptation Program**[6]**,** addressing both variability and extreme events, will enhance the adaptive capacity of communities, and the ecosystems on which they rely, to climate change.

44. Strong linkages will be made with regional and national programmes where UNDP is the Implementing Agency, including the **Second National Communication (SNC)** to the UNFCCC**.** These programs address baseline natural resource, disaster response, and economic development issues. The lessons from these ongoing programs will be applied to the implementation of the proposed project. Lessons form the project will in turn be entered in the UNDP-GEF's **Adaptation Learning Mechanism**.

45. This LDCF project will ensure coordination with CBA mechanisms at the local level through national NGOs (such TANGO) and through UNDP. Recently, Tuvalu also became a member of the **GEF/Small Grants Programme** which highlights community-based adaptation to climate change projects as a high priority.

46. The MNRE led the preparation of Tuvalu's **National Adaptation Program of Action (NAPA).** A wide range of stakeholders participated in the consultative process that led to the identification of priorities and recommendations concerning resources to be allocated to climate change risk management and adaptation. The Tuvalu NAPA was submitted to the UNFCCC Secretariat in 2007, and it identifies the first priority to "[i]ncrease the resilience of coastal areas and community settlements to climate change". The proposed project is the first community-based adaptation project to be implemented by the Government of Tuvalu to deal with adverse impacts of climate change with special focus on cyclone, storm surges, salinity, and community livelihoods.

[5] Poverty-Environment Partnership, 2003. *Poverty and Climate Change: Reducing the Vulnerability of the Poor through Adaptation*. UNDP, UNEP, World Bank, ADB, AfDB, GTZ, DFID, OECD, EC on behalf of the Poverty-Environment Partnership. http://www.energyandenvironment.undp.org

[6] Community-Based Adaptation Programme. http://www.undp-adaptation.org/projects

47. The project is fully in line with the **UNDP's country program for Tuvalu**, specifically the third strategic outcome area: Environment and Sustainable Management (*improving capacity to mainstream environmental sustainability* and *strengthening community capacity to adapt to environmental changes and demands on natural resources*) The project also addresses the Millennium Development Goals (MDGs), specifically MDG Goal 7: *"Ensure Environmental Sustainability*" and MDG 1: "*Eradicate Extreme Poverty and Hunger"*.

48. The proposed NAPA follow-up project is part of the proposed **GEF-Pacific Alliance for Sustainability (G-PAS**), which is led by the World Bank on behalf of all GEF Agencies. It will complement the activities proposed by the SCCF-funded **Pacific Adaptation to Climate Change (PACC)** and the Sustainable **Integrated Water Resources Management (IWRM)** projects and ensure that the alignment of these projects in a programmatic manner maximizes the degree of learning and replication of high-impact adaptation solutions. The key focus of PACC and IWRM interventions in Tuvalu is on water resource management; both programs are highly complementary to the project. As both the PACC and IWRM projects are in their inception phase, with national level activities in Tuvalu are being planned, synergies and complementarities with the project will be closely identified.

49. While the G-PAS technically seeks to increase the efficiency and effectiveness of GEF Trust Fund support to Pacific Island Countries (PICs), the proposed project provides a complementary operational mechanism for a regional partnership with national level activities. Through this programmatic setup, LDCF, SCCF and funding by the GEF Trust Fund will play a catalytic role in leveraging national level investments to meet the additional costs of climate change adaptation in Tuvalu.

50. UNDP is well suited to ensure exchange of knowledge with other community-based adaptation projects, most notably the SPA-funded Community-Based Adaptation Programme (CBA), the SGP projects, community-focused components of regional GEF projects (PACC, IWRM), as well as similarly focused projects in other regions, such asthe LDCF-funded project "Community-based Adaptation through Coastal Afforestation in Bangladesh". The CBA demonstrates a range of community-based adaptation options in 10 different pilot countries (Samoa being the pilot country in the Pacific, to be rolled out to the broader region), whereas the Bangladesh project focuses on livelihood diversification and participatory greenbelt management in low-lying, flood-prone communities. Together with the proposed project, these experiences will deliver a 'critical mass' of knowledge about community-based adaptation in coastal zones, which will enable documentation of livelihood-based and low-cost alternatives to large-scale infrastructure projects that have limited chance for short-term replication. Channeling of this knowledge through the Adaptation Learning Mechanism (ALM) platform will enable exchange of project experiences with governments around the globe.

51. In line with the above efforts, the proposed project addresses the intersection of disaster risk reduction and climate change adaptation. All of these major guiding strategies emphasize the UN's goal to promote an equitable and sustainable growth in Tuvalu that

contributes to faster and more efficient poverty reduction and sustainable use of natural resources.

52. In addressing climate change and adaptation, the project will be implemented as a nexus of strong linkages between national stakeholders (government and communities), regional organisations, and development partners, as shown below in Figure 3. Linkages with regional organisations (SOPAC, USP, and the SPC) will support technical assessments of island-specific erosion dynamic processes and soft erosion control techniques, water resource management issues, and identification of salt-tolerant species for agriculture. Linkages with development partners (JICA, EU, and AusAID), will support erosion management, community awareness raising, disaster risk management, and increasing water storage capacity for domestic use.

53. The Government of Tuvalu, together with regional organisations and development partners, has made a commitment of US$3.3 million towards parallel co-financing activities in the context of this project. With financial support of the LDCF, the national coastal development and management framework will begin to build the necessary human, institutional, and ecological adaptive capacity to address the dynamic and growing impacts of climate change, including gradual hazards such as sea level rise, erosion and salinization, which severely affect Tuvalu.

54. Further details of relevance of the project within Tuvalu's current policy and legislative context are provided in Annex 4. Threats, Risks, and Assumptions are provided in Annex 3.

Country Ownership: Country Eligibility and Country Driven-ness

55. The proposed project fits with objectives of the LDCF, Tuvalu's national development priorities as outlined in Te Kakeega II, Tuvalu's NAPA and National Communication to the UNFCCC, and the MDGs. Tuvalu, one of the 48 LDCs, ratified the UNFCCC in 1992 and is eligible for technical assistance from UNDP. This project has been endorsed by the national GEF operational focal point.

56. Consistent with the Conference of Parties (COP-9), the project will implement priority interventions in Tuvalu's NAPA in fulfilment of the criteria outlined in UNFCCC Decision 7/CP.7 and GEF/C.28/18. It will catalyze and leverage additional co-financing resources from bilateral and other multilateral sources. The project requests the LDCF to finance the additional costs of achieving sustainable development imposed on the LDCF-eligible countries by the impacts of climate change. It is country-driven, cost-effective, and will integrate climate change risk considerations into coastal zone management plans and national budget allocation processes, which are priority interventions that are eligible under LDCF guidelines. The project focus of (i) expanding community-based adaptation options to increase resilience against climate change risks; (ii) monitoring conditions for and development of response strategies and measures to respond to the adverse effects of sea level rise; and (iii) improving local awareness and understanding of communities and other key stakeholders about the necessity and benefits of preparedness for climate change risks, is aligned with the scope of expected interventions as articulated in the

LDCF programming paper and decision 5/CP.9. As climate impacts fall disproportionately on the poor, the project recognizes the link between adaptation and poverty reduction (GEF/C.28/18, 1(b), 29).

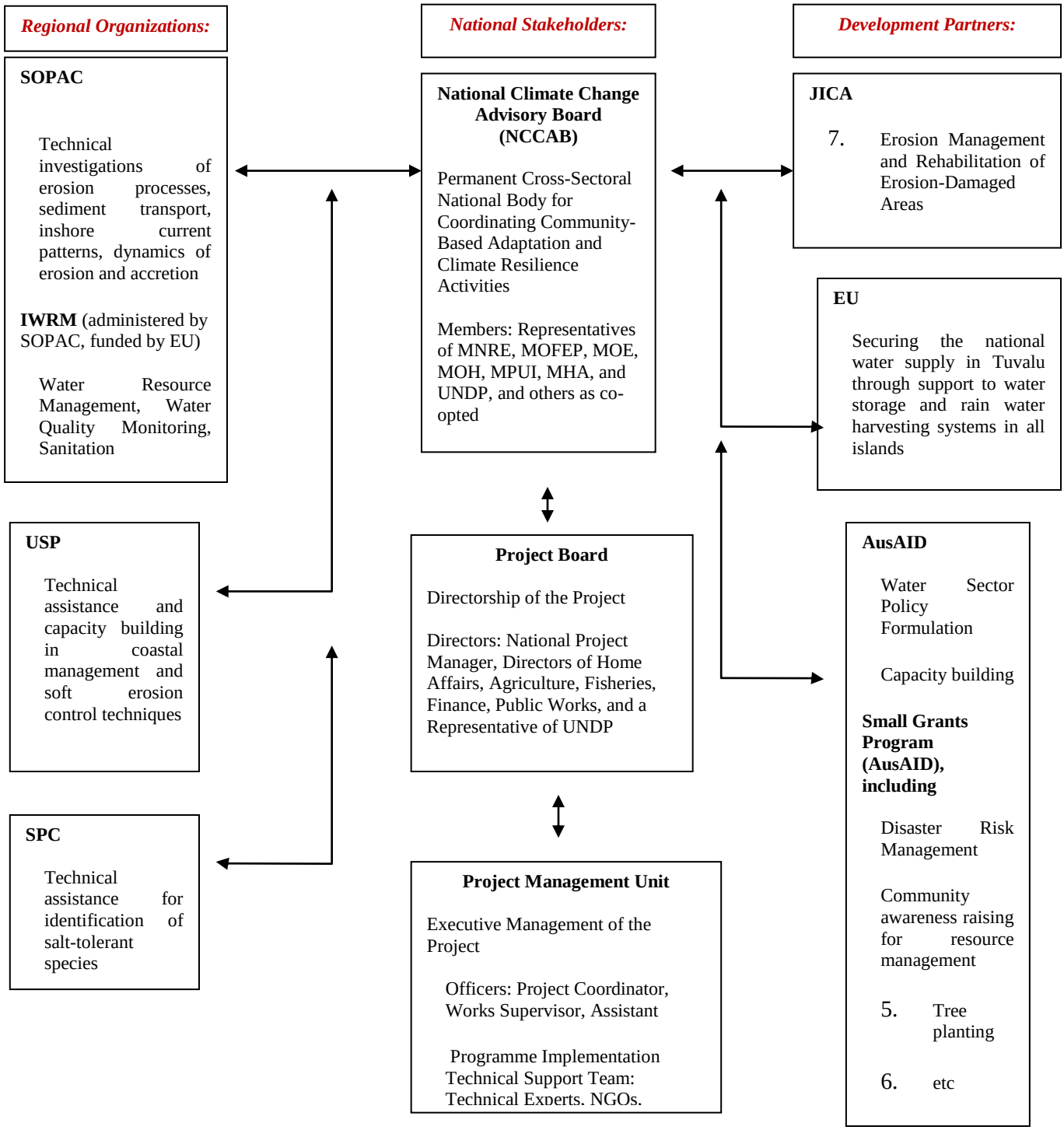
57. The proposed project will pilot interventions that a country-driven process has deemed urgent and immediate, and in this respect, it meets the eligibility criteria of the Least Developed Country Fund (LDCF) as outlined in the LDCF guidance paper. It is consistent with the Government-endorsed UNDP CPAP for Tuvalu (2008-2012)7 Responding to the needs of Tuvalu, UNDP will extend support to (i) improving capacity to mainstream environmental sustainability, which covers addressing priorities identified in the NAPA; and (ii) strengthening community capacity to adapt to environmental changes and demands on natural resources. .

58. This project has emerged from the Tuvalu NAPA document, which was completed in 2007. The methodology used to develop the NAPA was a widely consultative process involving stakeholders at the national, district, and grassroots levels, and it covers agriculture, forestry, livestock, environment, roads, health, finance, planning, and home affairs.

59. The UNDP Country Office has built strong linkages with the Government of Tuvalu, the international donor community, and civil society organizations. Support for sustainable development and climate resilience in Tuvalu has begun through institutional capacity development with a range of stakeholders from several government departments, including MNRE and the Ministry Agriculture. Strong productive links with key NGOs, including TANGO and the National Council of Women have been established.

[7] UNDP, 2009. *UNDP Fiji-MCO - Country Programme Action Plan (CPAP).*

Figure 3: Agency Linkages for Climate Change Risk Management



Project Goal, Objectives, Outcomes, and Outputs/Activities

60. The **goal** of the project is to increase the resilience of coastal areas and community settlements to climate change throughout Tuvalu. The **objective** of the project is to increase the protection of livelihoods in coastal areas from dynamic risks related to climate change and climate variability in all inhabited islands of Tuvalu.

61. The three outcomes and their output areas outlined below are not sequential: policy development and capacity building, demonstration project implementation, and the capture of knowledge and lessons learned will be carried out in parallel, mutually reinforcing, and closely linked.

OUTCOME 1: Enhanced capacity of MNRE and MPUI , Island Kaupules, communities and participating NGOs, with policy support to plan for and respond to climate change risks in coastal areas and settlements

Without LDCF intervention (baseline Project)

62. Climate change, its impacts, and what could be done to manage emerging risks in the context of uncertainly are currently poorly understood by government agencies or more generally by civil society in Tuvalu. Climate risks do not prominently feature in coastal planning efforts at either the national or local levels. Climate change concerns in Tuvalu are still new in the context of national development policy, and there are significant gaps in legislation and policy, and in budgeting and coastal zone management expertise necessary for incorporating climate risk information in sectoral planning.

63. Activities that are ongoing in relation to climate change include some community-based efforts, including coastal tree-planting projects sponsored by government and by NGOs on some islands. However, such activities are generally *ad hoc*, piecemeal, and not specifically designed for managing long term climate change, including variability issues. Furthermore, they are not supported by integrated policy or nationally coordinated supervision and management and as a result, quality control and efficiency is undermined. Without LDCF intervention, these gaps will persist; policy makers, development planners, and disaster management professionals will not be able to efficiently interpret and integrate climate risk scenarios and adaptive measures into concrete policies, plans and programmes. Sectoral planners, policy makers and vulnerable communities will not be able to anticipate climate change impacts and integrate these concerns into policy revision, financial planning and decision-making processes.

64. Moreover, the scope of current initiatives will not be broadened to include climate change considerations into national and local planning efforts focusing on the protection of livelihoods. Livelihoods and coping ranges within coastal communities will thus continue to deteriorate as a result of sea level rise and increasing soil and aquifer salinity, which in turn severely constrain freshwater supply and subsistence crops. The existing Disaster Coordination Office will continue to deal with extreme events, including becoming

functional (beyond a public information role) after a disaster has occurred . Attention to the multiplicity of climate change-induced threats will remain extremely limited within current institutional frameworks.

65. Findings from climate risk assessments have not been incorporated into coastal development strategies or sectoral planning processes. There is little or no policy support directing planning and financial resources to the essential community-level monitoring, training, and management functions that are required to build and maintain momentum for coastal zone adaptation that Tuvalu's future depends on. .

With LDCF intervention (adaptation alternative)

66. The education and training and other capacity building activities that are proposed for national and island level planners and communities under this project will raise awareness of climate change and adaptation and will help to improve coordination among institutions. The island kaupule and participating NGOs such as TANGO and TNCW will be able to better integrate climate change risk management into island planning processes and intervention programs. Public officials at all levels will be better able to support community-based adaptation.

67. The project will be assisted by local and international expertise, and improved institutional coordination between the MNRE, Ministries of Agriculture, Fisheries, Education, Health, and NGOs. Planners from government agencies and NGOs will be trained in climate risk assessment and reduction, vulnerability assessment, identification and design of appropriate adaptation options, and climate-resilient coastal planning.

68. With LDCF funding, a climate change sensitive coastal zone management policy will be developed. Coordination among the agencies of national government concerned with coastal zone management and environmental protection (MNRE and MPUI), and between these agencies and the coastal communities will be institutionalized, to ensure that feedback from the impacts of coastal zone policies is communicated to the national level. Greater stakeholder involvement in policy development and implementation will be promoted.

Outputs and indicative activities

69. Enhancement of technical capacity of national planners, kaupule, and communities includes vulnerability assessment techniques, evaluation of existing adaptation techniques and tailoring them to the specific conditions of each islands through participatory planning processes. Coastal zone management policy will be developed and proposed to government as a means to guide appropriate development and regulation of the environment (including guidelines for sand mining and fuel wood extraction) in coastal areas, linking with related sectoral policies (e.g. Public Works, Agriculture, Water). Capacity development activities for the integration of climate change risks into sectoral planning will be developed for national and island levels.

Output 1.1: *Financial provisions are reflected in the national budget, public sector asset management plans, and National Development Plan for climate change risk management in coastal areas.*

Indicative Activities:

70. Analyses and guidelines for climate-resilient coastal planning will be developed and disseminated for use by sectoral planners. These materials will be used for capacity development and policy advocacy by the Project Management Unit.

71. Training seminars on the procedures of climate-resilient coastal and land-use planning for relevant national ministries and organizations will be conducted, involving participants from the Ministry of Natural Resources and Environment; Lands and Surveys; Ministry of Agriculture; Ministry of Fisheries; the island Kaupule; the Ministry of Works, the Ministry of Education, and the Ministry of Health. Ministry of Local Government, Rural Development, and Co-operatives; and the Ministry of Water Resources. The seminars will focus on climate change impacts and on managing climate risks for natural resources and infrastructure in coastal areas; and will detail ways to facilitate policy dialogue between the national and island levels and implement policy cooperatively, supported by practical adaptation demonstration projects that stimulate policy revision and coastal development planning.

72. Government officials in the planning section of the relevant ministries/departments, including the ministries mentioned above, will be trained in procedures, techniques of economic, financial, and technical assessment, and budget guidelines for incorporating climate risk into planning evaluations and adaptation into project and policy design. National sectoral planners involved in infrastructure, housing, and environmental protection in coastal zones will be able to anticipate climate change-induced risks in their professional sector and advocate/plan for suitable corresponding adaptation measures, and all relevant ministries will explicitly recognise and accept their roles and responsibilities in addressing climate change. Successful training and capacity building will be indicated by all key agency budgets at the national level incorporating provisions to ensure that climate risk management is effectively financed through a combination of internal and external resources.

73. National officials will visit each island where different climate-resilient activities and measures are being implemented, to enhance the officials' practical knowledge of community-based adaptation and sustainable management of protective systems.

Output 1.2: *A coastal zone management policy is developed and related project plans and sector development strategies are modified to incorporate climate risk management provisions on the basis of specific climate risk scenarios.*

Indicative Activities:

74. Following a detailed policy review, a new national policy will be prepared supporting integrated coastal zone management (CZM) that incorporates measures for climate

resilience. In conjunction with this, climate resilience considerations and provisions will be integrated into each island's coastal development plan, incorporating health, water resources, agriculture, fisheries, and other sectors. Island-level development plans will be prepared or enhanced to integrate climate resilience. A coastal zone development strategy incorporating climate change risk on the basis of specific scenarios will be developed for each island.

75. Under the project, training workshops will be designed and conducted in all islands for kaupule members, local villagers (emphasising the participation of women), and local NGOs on assessing, planning, and implementing community-based adaptation measures, and strengthening linkages between key institutions, such as the kaupule, relevant NGOs, and especially the national government. Technical and financial support will be provided to local institutions, such as the kaupule and community training centres, to act as "Local Climate Resource and Support Centers" and ensure coordination among different stakeholders of vulnerable sectors and their current portfolios, including consistent monitoring by the institutions of links between climate change, current climate risks, and community-based adaptation measures. Project support will enable the kaupule and training centres to facilitate meetings, review community-based adaptation initiatives to identify complementary activities, and assess organizations' specific expertise in implementing community-based adaptation. By end of the project, kaupule officials will be able to anticipate climate change risks and facilitate community-based adaptation measures in coastal areas.

Output 1.3: *A National Climate Change Advisory Board is established, trained and resourced to support community-based adaptation planning and implementation in Tuvalu.*

Indicative Activities:

76. At commencement of the project, a National Climate Change Advisory Board (NCCAB) will be established to oversee the project and to manage, coordinate, and secure finance for community-based adaptation and other responses to climate change risks in Tuvalu. The NCCAB will provide overall policy guidance and coordination among the Ministries, Departments, and NGOs involved (including MNRE, MPUI, MOH, MOE – see Part III, Management Arrangements). Technical support will be provided by the Project Coordinator and the technical experts hired under the project in close coordination with development partners (see Part III).

77. Under the NCCAB acting as the "National Climate Resource and Support Center" for community-based adaptation in each island of Tuvalu, climate resilience will be integrated into island development plans and approved by the respective kaupule.

Output 1.4: *A national awareness and training campaign for local communities and kaupule is designed and implemented*

Indicative Activities

78. Representatives of all vulnerable communities in all of Tuvalu's islands will be trained and assisted in assessing, prioritizing, planning, and implementing community-based adaptation measures. Assessments will be conducted by the project coastal zone and adaptation specialists with active participation of community stakeholders to determine which communities are most vulnerable to climate risk and, within these, the existing capacities and training needs for them to deal effectively with longer-term climatic and environmental changes. These assessments will be coordinated with the community-based adaptation plans under Output 2. NGO representatives, village level Red Cross workers, and other community members will be trained to apply appropriate methods to assess climate change issues, community-based adaptation planning, and household-level risk reduction interventions.

79. Island-level climate change networks of coastal communities represented by their leaders will be established to raise community awareness of climate risk reduction, local participation, decision-making, and livelihood security in each island. Utilising the networks, culturally appropriate tools will be developed to raise awareness on climate change impacts on relevant sectors. A community awareness campaign will be designed and conducted on climate change risks, using culturally appropriate tools and aimed at both genders, including information packs that comprise examples of community-based adaptation measures in all relevant livelihood segments (fisheries, agriculture, livestock, forestry, water, communal services, etc.)

80. At least 1000 households in all islands will be made aware of climate change-related risk issues and community-based adaptation options. The effectiveness of awareness programs will be monitored and lessons learned will be applied to improve the quality of local capacity building efforts.

OUTCOME 2: Enhanced capacity of local communities to adapt to dynamic climate-related impacts and risks and to protect their livelihoods through implementation of practical community-based adaptation measures specifically tailored to each islands

81. This outcome will focus on the participatory development of a community-based adaptation plan in each island, encompassing the following initiatives:

    i) 'soft' coastal protection (mangroves, soft structures and techniques, and other model demonstrations as determined by the communities);

    ii) improvements in the security of household and community water supplies; and

    iii) improvements in the resilience of local agriculture.

82. Site-specific adaptation plans will include a thorough analysis of the most appropriate mix of greenbelt (plantation) and 'soft' coastal protection technologies which can be installed and maintained by communities using chiefly local materials; the definition of roles and responsibilities among community members, government institutions, and NGOs; and mechanisms to monitor the impacts of interventions. The adaptation plans

will be supported by detailed technical assessments carried out under the project and under parallel initiatives of regional organisations and development partners (see Figure 3 above) and will detail the specific areas for mangrove and non-mangrove plantation, identify the communities involved and families that will receive water supply and agricultural livelihood support based on their vulnerability to climate change-related challenges and opportunities.

Without LDCF intervention (baseline)

83. As the frequency of extreme climatic events, such as cyclones and storm surges, as well as gradual climatic effects such as salinization, gradual erosion, and coastal inundation are projected to increase, it is highly likely that the technical range and geographical reach of current baseline interventions will be insufficient to reduce vulnerability. Without LDCF intervention, climate change will not be adequately factored into current and planned coastal development projects, and the potential of climate-resilient livelihood options will not be fully analyzed and exploited.

With LDCF intervention (adaptation alternative)

84. The project will introduce active community participation and incentives for maintaining new mangrove plantations and thinking about community-based adaptation activities that will effectively counter rising threats due to climate change, involving *inter alia* possible changes in land-use, expansion of coastal protection, changes in cultivation methods and in the types of crops sown, alteration of solid and liquid waste disposal methods, and water storage capacities and regulations. Sustaining such activities into the indefinite future, as demanded by climate change, will require community-level know-how, awareness, and leadership, supported appropriately by the policy and resources of the national government. Initially, this will be accomplished under the overall direction and coordination of the NCCAB, developing and using processes that will be sustained by capacity building activities undertaken by the project.

85. With funding through the LDCF, coastal communities will be actively involved in developing defences and planting mangrove and other species as well as, where required, constructing low-tech 'soft' coastal protection options. The project will support the development of climate-resilient agricultural livelihoods, which will improve the sustainability of coastal areas and of ecosystems needed to safeguard communities against climate change-induced hazards. Opportunities for reducing vulnerability through alternative climate-resilient livelihoods in the coastal areas remain to be assessed in their full potential, an assessment that is addressed in Outcome 3.

86. LDCF funding will be used to build on current experience in Tuvalu and help further to develop mechanisms for community-based greenbelt and protective development, as described in indicative activities below. Interventions will include constructing energy-absorbing coastal defences and facilitating alternative livelihood options through crop diversification, creating freshwater reservoirs for dry season agriculture, and harvesting rainwater. These will be piloted at project sites, with mechanisms for upscaling identified.

87. During the Project Preparatory Grant (PPG) phase, government officials and representatives of the island kaupules were consulted to determine the priority local adaptation needs of each island and the currently available adaptation measures for coastal afforestation, existing livelihood options (agriculture- and fisheries-based), and local preparedness systems for extreme events. Information gained during the PPG will be used to design site-specific activities during the adaptation planning process. Island project "profiles" developed as a result of this consultation are presented in Annex 5.

Outputs and indicative activities

Output 2.1: *Community-based adaptation plans for coastal protection, water supply security, and agricultural livelihood sustainability are developed for all islands in Tuvalu.*

Indicative Activities:

88. Community-based adaptation plans on coastal protection, water supply security, and/or resilient agriculture and livelihood sustainability will be developed with the active participation of local communities and the respective island kaupule and local NGOs. Community groups in each island will be organised, civil society networks will be established, and extensive awareness raising among all affected communities will be conducted in order to build consciousness of priority climate-risk related priorities and determine community-directed means to address them. Through this process, additional initiatives, including community-based means to diversify livelihoods in agriculture, coastal land management, and inshore fisheries will be closely examined and developed for future implementation.

89. In regard to coastal protection, the development of adaptation plans in each island will include a thorough analysis of the appropriate site-specific mix of coastal protection technologies to be employed in each case with community participation, options for which will include 'greenbelt' plantations of mangrove and non-mangrove species and, where indicated by local geologic and marine conditions, 'soft' coastal protection works that can be installed and maintained by the communities.

90. A community-based adaptation study for each island will be completed which identifies potential community-based adaptation projects for future implementation and replication. The existing range and future potential of community-based climate change adaptation options for Tuvalu will be identified and documented.

Output 2.2: *Community-based adaptation projects with a focus on participatory management of protective ecosystems and climate-sensitive natural resources are designed and implemented in at least 1 pilot site on each of Tuvalu's 9 islands*

Indicative Activities:

91. The community-based adaptation projects identified by the island kaupules during the PPG consultations address immediate and pressing needs of each island, but allow for more comprehensive adaptation planning and implementation specifically tailored to each island and vulnerable community. Specific adaptation projects will be further adjusted during the project inception phase.

92. Model demonstration projects of planting mangrove and non-mangrove species effective in coastal protection will be established in 4 islands including Funafuti. This activity will focus on training in nursery development, maintenance of plantations and sustainable natural resource management. Families will be directly involved in nursery development, plantation, and maintenance of the plantations, which will provide direct livelihood support to the involved families. Household-level information, particularly their livelihood assets, will be used during the selection process to identify participating families. The location of plantations will be based on the availability of land and maximization of protective benefits of the physical and social system. The aim will be to adopt a mix of species that are able to withstand higher salinity and inundation levels, longer inundation times and ensure overall protective functions in extreme weather conditions. People in all vulnerable communities will participate in the management and protection of new coastal plantations financed by the project.

93. Water supply security (rainwater storage) initiatives will be facilitated in a participatory manner in four target islands. All households in the affected communities will participate in each island. The plans will focus on initiatives and promotion of different livelihood options that will vary by pilot area as appropriate.

94. Pulaka and breadfruit cultivation and productivity will be substantially improved through protection from saline groundwater. Crop diversification will include promotion of salt-tolerant varieties, and irrigation with stored rainwater.

95. Effective models for coastal protection projects will be demonstrated by the project. Coastline protection will be significantly enhanced through the development of protective measures designed to absorb rather than deflect wave energy. This will be undertaken using currently available technology suitable for use by community members. Communities will establish protective measures and evaluate their effectiveness for potential replication elsewhere. The aim will be to introduce communities to soft engineering technology which can be repaired, replaced and re-used as required to enhance and extend plantation protection, providing the most cost-effective approach to coastal protection from erosion.

96. Measures will be undertaken to secure long-term and adequate water supplies for some islands to strengthen local agriculture, now weakened because of salt intrusion. These measures will be taken in response to either currently inadequate water supplies or failure of current water storage systems. Ensuring adequate fresh water will enhance community resilience through ensuring longer-term availability of freshwater supplies for domestic or agricultural purposes. The project will demonstrate that enhancement of community water supplies can be undertaken in a cost-effective and targeted way to improve the quality of community life.

97. Output 2.3: The results of all community-based demonstration projects are analysed and fed into the formulation of a government-endorsed replication programme

    Indicative Activities:

98. Supported by the capacity building, community organising, and awareness-raising activities of Outcome 1, and the community-based adaptation plans developed under Output 2.1, experience with community-based adaptation at the design and implementation levels will be reviewed and thoroughly analysed. The lessons learned throughout implementation of community-based adaptation activities under the project will be carefully documented by communities, the kaupule, and the national coordinating authority, with a view to selecting a robust set of effective community-based activities that can be applied by government and NGOs in expanded efforts to replicate and promote future CBA projects in all islands.

99. Under the NCCAB, with assistance from personnel throughout government and NGOs trained in adaptation planning and implementation (Outcome 1), the knowledge and experience gained in the adaptation project implementations carried out under the project will be applied in a continuing process of adaptation project planning and execution in all islands. Supporting this, the policy frameworks and strategies revised under the project will create an effective framework for long-term adaptation actions. Revisions to operational budget plans and to the National Development Plan (Outcome 1), covering expenditure of both external and government resources, will reflect adaptation-related work in the future. The documentation of community-based demonstration projects will ensure that information is generated and available for current and future professionals and community practitioners.

100. OUTCOME 3: Project knowledge and lessons learned are captured, analysed and disseminated to facilitate replication of practical adaptation solutions in all islands

Without LDCF intervention (baseline)

101. Tuvalu, as one of the most vulnerable countries in the world to damage from climate change, will demonstrate effective low-cost and community-based adaptation approaches under the project, and learn lessons of great value to other low lying countries and regions of the world. Future development interventions in such countries need to incorporate these lessons in order better to focus assistance and projects in the future. To counter climate change effectively, external assistance to adaptation must steadily increase and achieve steadily greater impact. Without the project, lessons learned from the project will not be exchanged to stakeholders in a systematic manner. Lessons from successful community-based adaptation interventions will not be systematically documented, synthesized, and communicated to wider audiences. Therefore, valuable experience generated from the proposed project would remain inaccessible to users and planners in other countries facing similar challenges.

With LDCF intervention (adaptation alternative)

102. The project will improve the collection and exchange of knowledge and thus enhance the replicability of successful coastal management and adaptation to climate change both within Tuvalu and in other countries. Systematic contribution to the Adaptation Learning Mechanism (ALM) and hosting of national and international workshops on coastal protection and other community-based adaptation measures are included in the project activities. Synergies will be created to other regional processes and projects (such as PACC, IWRM) with knowledge management components to incorporate the lessons learnt from this project.

Outputs and indicative activities

103. Recommendations for integrating climate change into national and sectoral policies will be developed on the basis of local needs. A special focus will be on improving the sustainability of coastal afforestation, land use, and livelihoods systems. Regular dialogue among stakeholders at the national to local levels established for effective coordination among institutions.

Output 3.1: *Climate change risk projections and scenarios for Tuvalu are analysed, updated and disseminated to sectoral planners and policy makers*

Indicative Activities:

104. A scientific risk assessment of each island will be prepared by national government and NGOs for dissemination and use in planning future projects. Appropriate policy briefs will be developed by the national coordinating authority, outlining and demonstrating the impacts, costs and benefits of a particular sectoral policy on the resilience of livelihoods and habitation in coastal areas. These will, for example, review impacts of existing land use policies on the sustainability of protective greenbelt structures and develop policy recommendations for MNRE to enhance the sustainability of coastal protective tree cover. These assessments will e closely coordinated with the Second National Communications, currently being developed in Tuvalu

105. The institutional coordination process over the project lifetime will be monitored and the results communicated to policy stakeholders at all levels. Barriers and challenges of institutional coordination will be assessed and mechanisms proposed for integrated and synergistic approaches to joint climate-resilient development planning in coastal zones.

106. A thorough review of existing climate change modelling of relevance to Tuvalu will be undertaken and links with international climate modeling groups working with the IPCC will be firmly established by the government. Gaps will be identified in the existing modelling data and these gaps will be communicated to the climate modeling groups. This will enable climate change risk projections to be easily and routinely updated by government and disseminated to implementing agencies and NGOs. Existing modelling information as updated from time to time will be routinely disseminated to relevant agencies of the national government, NGOs, and communities as appropriate by the PMU.

107. Gaps in baseline data for each island will be identified under the direction of the NCCAB. Baseline data on climate change vulnerability will be collected and assessed for at least two key sectors (e.g., fisheries, agriculture, water supply) in each island.

Output 3.2: *Lessons learned from community-based adaptation projects are collated and disseminated to communities, sectoral planners and policy makers on a continuous basis*

Indicative Activities:

108. Project experience and lessons learned from community-based adaptation project implementation will be fed back into the project in a continuous feedback loop from the earliest stages of the project in order to guide project refinements on an on-going basis and to inform future adaptation planning and replication, both in Tuvalu and in other countries. Feedback will be collected from the communities in the project sites through the community consultation and awareness-raising processes of the project, and in the course of the specific technical assessments undertaken on each island, both by project experts and by regional organisations and development partners.

109. One national and one international workshop on coastal afforestation and other climate-resilient livelihoods will be conducted. A government website will be established and routinely updated, documenting community based adaptation activities implemented under the project, with updated national and local vulnerability assessments, and proposals for future projects.

Output 3.3: *Project lessons are shared within and outside of the Pacific region and incorporated into the Adaptation Learning Mechanism (ALM)*

Indicative Activities:

110. Guidelines for extracting lessons learned will be drawn from the ALM. All project monitoring and evaluation reports will be screened for inclusion in the ALM, and key project lessons will be captured and disseminated.

111. A government website will be created and maintained under the direction of the PMU, for the purpose of facilitating exchange of information and world-wide access to project lessons of relevance to community-based adaptation ongoing or planned outside of Tuvalu. The website will also be used by national stakeholders (the government, NGOs, and communities) to be kept informed of the project as it is implemented on all islands.

112. A review of community-based adaptation projects and activities world-wide will be undertaken to identify and establish close links with those for which experience in Tuvalu under the project is highly relevant, such as the CBA program and LDCF-funded activities in other countries. Close contacts with relevant projects outside of Tuvalu will be maintained to facilitate exchange of up to date data and lessons learned as they emerge. Follow-up/replication projects within Tuvalu will be designed on the basis of these project lessons. The project will aim to inform follow-up/replication projects

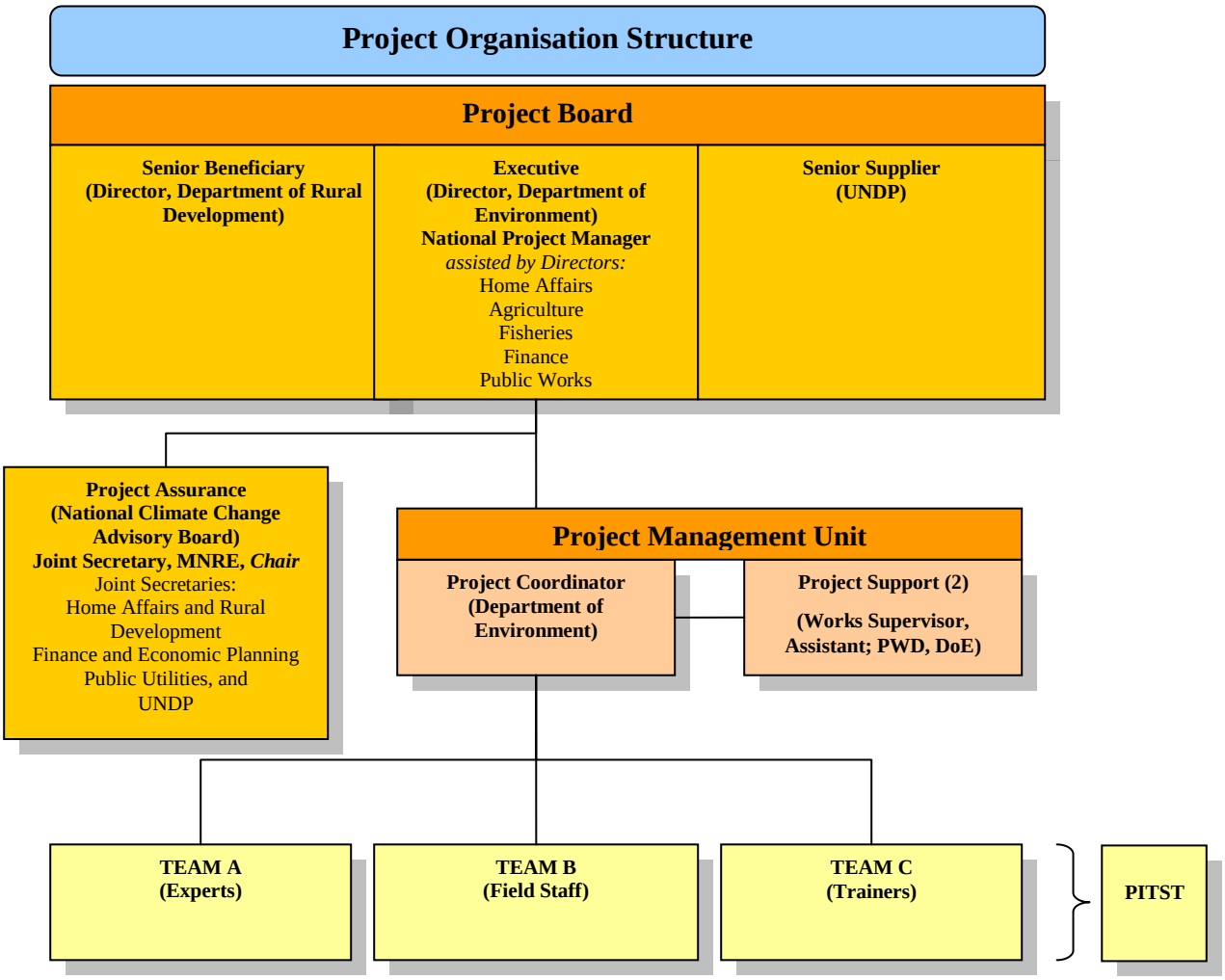
outside of Tuvalu with project lessons. New research initiatives for coastal adaptation will draw on knowledge gaps identified during the project.

PART III: Management Arrangements

113. The project will be implemented over four years beginning in November 2009 in line with the organogram shown below. The project will be executed by the Ministry of Natural Resources and Environment (MNRE) and the Department of Environment as the lead Implementing Agency. The Secretary, MNRE, will chair the National Climate Change Advisory Board (NCCAB) to be established under the project. UNDP will serve as the GEF Implementing Agency for this Project. MNRE and UNDP will jointly monitor and evaluate all project activities. The project will be governed in accordance with the Guidelines, GEF Rules and Procedures and Government of Tuvalu operational principles.

114. Establishing an effective project management structure is crucial for the project's success. The project need effective direction, management, control and communication and has been designed according to the following project organisation structure:

Figure 4: Project Organisation Structure



115. A Project Board will be responsible for making executive management decisions for the project and will comprise the Director of Department of Environment as the Executive to chair the group, the UNDP as Senior Supplier to provide guidance on the technical feasibility of the project, and the Director of Department of Rural Development as the Senior Beneficiary to ensure the realization of project benefits from the beneficiaries' viewpoint. This group shall provide guidance to the Project Coordinator at the Department of Environment when needed including project revisions. Reviews by this group to ensure quality programming is undertaken are to be made at designated decision points during the running of the project, or as necessary when raised by the Project Coordinator. This group is consulted by the Project Coordinator for decisions when project tolerances have been exceeded.

116. As Executing Agency for the project, the MNRE will have responsibility for facilitating project coordination with other relevant departments, agencies and organizations in Tuvalu. MNRE will ensure the timely and effective delivery of project outputs and the proper use of project resources.

117. The MNRE will appoint the Project Coordinator who will be responsible for the overall planning and implementation of the project, coordination with the Director and other stakeholders and for the preparation of reports (including financial reports) to UNDP and the NCCAB. The Project Manager will be responsible to UNDP and to the Project Assurance body, the Tuvalu National Climate Change Advisory Board (NCCAB), for the effective implementation of the project. As far as possible, consideration of previous and ongoing projects, studies and reports relating to renewable energy technologies will be considered.

118. **National Climate Change Advisory Board**: The NCCAB will meet at least once per year. It is the highest oversight body at the national level and will ensure that the project is aligned with the Government's broader climate change, environmental and development objectives as well as complementary to the implementation of PRS and MDGs (for detailed TORs, see Section IV, Part III). The Secretary of MNRE will chair the meetings of the NCCAB, and representation from other ministries will not be below the rank of Joint Secretary. Other members of the NCCAB will include the Ministries of Home Affairs & Rural Development, Finance & Economic Planning, and Public Utilities, UNDP; and others relevant may be co-opted. Apart from the UNDP representative, members of the NCCAB are employed by the government, and expenses relating to meeting allowances, etc., will be met by the government.

119. **Project Board**: The Project Board will meet once per quarter, or more frequently as necessary. The Project Board will be the main decision-making body of the project. Work of the Project Board will be guided by the continuous review, alignment and approval of Annual Work Plans (AWPs), which will be endorsed by the Implementing Partners and UNDP. The approved annual/quarterly work plans will be the instruments of authorization through which the Project Coordinator will deliver results. The Project Board will consist of: (1) the ***National Project Manager (NPM)*** (the Executive), representing project ownership and chairing the Project Board. The MNRE will nominate the NPM, who, given the strategic importance of the project, is expected to be a senior official from the MNRE; (2) ***Directors from Home Affairs, Agriculture, Fisheries, Finance and Public Works*** departments who will be nominated by the respective Ministry and will be responsible for implementing specific project components; (3) a ***UNDP representative*** in the role of Senior Supplier (representing the interests of the parties concerned which provide funding and/or technical expertise to the project) will provide guidance regarding technical feasibility and support to the project.

120. Kaupule and Director of the Department of Rural Development will jointly act as Senior Beneficiaries to promote community level ownership over the project and ensure the appropriateness of interventions in meeting community priorities.

121. **Project Management Unit (PMU)**: The Department of Environment will provide office space for the Project Management Unit (PMU) and professional staff. The PMU will be composed of the following project staff.

- 1 Project Coordinator
- 1 Works Supervisor (to be located within PWD)

- 1 Administrative Assistant

122. **Programme Implementation Technical Support Team (PITST**): The Programme Implementation Technical Support Team will consist of short-term and medium-term experts of different scale and types of individual who will be engaged to deliver different Outputs and Outcomes of the project. These include:

Experts:

- An international and a local expert in CZM
- An expert to develop capacity building and training materials in climate-resilient development planning and to assist in the establishment of the NCCAB, and a team to conduct the capacity building activities
- Trainers and community organisers to conduct training and community awareness at the island level
- An international and a local monitoring and evaluation expert, who will assist also with collection and dissemination of lessons learned
- A expert in the technical constraints and opportunities of introducing salt-tolerant species in island agriculture
- An MIS specialist to assist with database management and development and maintenance of a government website on the project
- Technical experts from line ministries involved
- Technical experts from regional organizations and development partners such as SPC for agriculture, SOPAC for water issues and coastal morphology, JICA for erosion control technical support, etc.

Field staff based at each Kaupule in project areas. Kaupule's Offices will provide office space for the technical advisers and field staff as required.

123. The Department of Environment will provide office space with basic amenities (such as electricity and water) for the PMU and the kaupules will support the field offices. PMU staff will be funded by the project throughout its duration to ensure delivery of results as specified in the Strategic Results Framework. The Project Coordinator will be responsible for delivery of outputs as indicated in the Strategic Results Framework. The Project Coordinator will be responsible for channeling the flow of results and knowledge from the project to the NCCAB and relevant Government ministries departments and kaupules as appropriate. In addition, the Project Coordinator will ensure provision of high-quality expertise and inputs to the project and also be responsible for day-to-day operations.

124. See Terms of Reference for the above positions and managing bodies in Section IV, Part III.

PART IV: Monitoring and Evaluation Plan and Budget

125. Project monitoring and evaluation will be conducted in accordance with established GoT and UNDP-GEF procedures by the project team and the UNDP CO. The Strategic Results Framework in Section II provides *performance* and *impact* indicators for project implementation along with their corresponding *means of verification*. These will form the basis on which the project's Monitoring and Evaluation system will be built.

126. The following sections outline the principle components of the Monitoring and Evaluation Plan and indicative cost estimates related to M&E activities.

Monitoring and Reporting

Project Inception Phase

127. Work Plans and Progress Reports: Annual and quarterly work plans will be the main management instruments governing the implementation of the project. The project will prepare an Annual Work Plan (AWP) with well-defined result indicators, using the standard format for UNDP-supported projects. Annual Work Plans will be appraised and endorsed by the NPD/MNRE and UNDP and based hereon quarterly work plans will be prepared. Upon approval, the annual and quarterly work plans will be an instrument of authorization to the Project Manager for implementation of the project. Human resources mobilization and procurement plans will be added to the AWP as annexes and be subject to review and endorsement by the NPD/MNRE and UNDP.

128. A Project Inception Workshop will be conducted with the National Project Director, Project Manager, MNRE and other relevant ministries and implementing partners of the Project Board, co-financing partners, the UNDP-CO and representation from the UNDP Regional Coordination Unit, as well as UNDP HQ as appropriate. The results of the Inception Workshop will be documented in an Inception report.

129. A fundamental objective of this Inception Workshop will be to finalize preparation of the project's first operational annual work plan (AWP) on the basis of the project's strategic results framework (SRF). This will include reviewing the SRF (indicators, means of verification, and assumptions) and imparting additional details as needed. On the basis of this exercise, the AWP will be finalized with precise and measurable performance indicators, and in a manner consistent with the expected outcomes for the project.

130. Additionally, the purpose and objective of the Inception Workshop will be to: (i) introduce project staff to the UNDP-GEF *expanded team* which will support the project during its implementation, namely the CO and responsible Regional Coordination Unit staff; (ii) detail the roles, support services, and complementary responsibilities of UNDP-CO staff vis à vis the project team; (iii) provide a detailed overview of UNDP-GEF reporting and M&E requirements, with particular emphasis on the annual Project Implementation Reviews (PIRs) and related documentation, the Annual Project Report (APR), Tripartite Review Meetings, as well as mid-term and final evaluations. Equally,

the IW will provide an opportunity to inform the project team on UNDP project-related budgetary planning, budget reviews, and mandatory budget rephrasing.

131. The workshop will also provide an opportunity for all parties to understand their roles, functions, and responsibilities within the project's decision-making structures, including reporting and communication lines, and conflict resolution mechanisms. The Terms of Reference for project staff and decision-making structures will be discussed again, as needed, in order to clarify each party's responsibilities during the project's implementation phase.

Monitoring Responsibilities and Events

132. A detailed schedule of project review meetings will be developed by the project management, in consultation with project implementation partners and other stakeholder, and incorporated into the Project Inception Report. Such a schedule will include: (i) timeframes for Tripartite Reviews, Project Board Meetings, and other relevant advisory and/or coordination mechanisms; and (ii) project-related M&E activities.

133. *Day-to-day monitoring* of implementation progress will be the responsibility of the Project Manager based on the Annual and quarterly Work Plans and associated indicators, with overall guidance from the National Project Director. Project team members will inform the Project Manager and UNDP-CO of any delays or difficulties faced during implementation so that the appropriate support or corrective measures can be adopted in a timely and remedial fashion.

134. *Quarterly monitoring* of implementation progress will be undertaken jointly by the Project Manager and UNDP-CO through quarterly progress and financial reports, and quarterly meetings of the Project Board (or more frequently as deemed necessary). This will allow parties to take stock and to troubleshoot any problems pertaining to the project in a timely fashion to ensure smooth implementation of project activities. The project's performance indicators will be fine-tuned in consultation with stakeholders at the Inception Workshop, with support from the UNDP-CO and UNDP-GEF Regional Coordination Unit. Specific targets for the first year of implementation will form part of the AWP and will be used to assess whether quarterly implementation is proceeding at the intended pace. Targets and indicators for subsequent years would be defined annually as part of the internal evaluation and planning processes.

135. *Annual Monitoring* will occur through the *Tripartite Review (TPR).* The TPR provides for international oversight of the project and consists of the three signatories to the project document (UNDP, MNRE, and the GEF Operational Focal Point). The project will be subject to TPR at least once every year. The first such meeting will be held within the first twelve months of the start of full implementation. With support by the Project Manager, the Project Director will prepare an Annual Project Report and submit it to UNDP-CO and the UNDP-GEF regional office at least two weeks prior to the TPR for review and comments. The TPR has the authority to suspend disbursement if project performance benchmarks are not met, based on delivery rates and qualitative assessments of achievements of outputs.

136. *The Annual Project Report (APR)* will be used as one of the basic documents for discussions in the TPR meeting. With support by the Project Manager, the Project Director will present the APR to the TPR, highlighting policy issues and recommendations for the decision of the TPR participants. The project proponent also informs the participants of any agreement reached by stakeholders during the APR preparation on how to resolve operational issues. Separate reviews of each project component may also be conducted if necessary.

137. UNDP Country Offices and UNDP-GEF RCUs as appropriate, will conduct yearly visits to the project field sites (based on an agreed upon schedules to be detailed in the project's Inception Report and Annual Work Plan) to assess firsthand project progress. Any member of the NCCAB can also accompany the visit, as decided by the NCCAB. A Field Visit Report will be prepared by the CO and circulated no less than one month after the visit to the project team, all National Project Board members, and UNDP-GEF.

138. *The Terminal Tripartite Review (TTR)* is held in the last month of project operations. With support by the Project Manager, the Project Director is responsible for preparing the Terminal Report and submitting it to UNDP-CO and GEF's Regional Coordination Unit. It shall be prepared in draft at least one month in advance of the TTR in order to allow review, and will serve as the basis for discussions in the TTR. The terminal tripartite review considers the implementation of the project as a whole, paying particular attention to whether the project has achieved its stated objectives and contributed to the broader environmental objective. It decides whether any actions are still necessary, particularly in relation to sustainability of project results, and acts as a vehicle through which lessons learnt can be captured to feed into other projects under implementation or formulation.

Project Monitoring Reporting

139. The Project Manager in conjunction with the UNDP-GEF extended team will be responsible for the preparation and submission of the following reports that form part of the monitoring process. Items (a) through (f) are mandatory and strictly related to monitoring, while (g) through (h) have a broader function and the frequency and nature is project specific to be defined throughout implementation.

(a) Inception Report (IR)

140. The Inception Report should address the following issues (and others deemed necessary): i) review and finalize project institutional arrangements including the role and responsibility of various participants for achieving the project outcomes; ii) review and finalize project management arrangements of the project, including reporting lines; iii) review, agree on and finalize the M& E framework for the implementation of the project; iv) re-confirm and coordinate all co-financing sources with the project work plan; vi) review, and where necessary identify additional project risks and prepare a detailed risk management strategy for project implementation; v) prepare a detailed work plan for the first year of implementation and prepare a budget revision if necessary; vi) update on progress to date on project establishment and start-up activities; and vii) update of any changed external conditions that may affect project implementation.

141. The preliminary first draft Inception Report will be shared with the UNDP-Fiji and UNDP -GEF as soon as available and before a final draft Inception Report is to be prepared. The final draft version is to be circulated to all stakeholders before the Inception Workshop for discussion and endorsement at the Inception Workshop. The agreed final Project Inception Report will be sent to stakeholders no later than 2 weeks after the national Inception Meeting.. It will include a detailed First-Year AWP divided in quarterly timeframes detailing the activities and progress indicators that will guide implementation during the first year of the project. This AWP includes the dates of specific field visits, support missions from the UNDP-CO or the Regional Coordination Unit (RCU) or consultants, as well as timeframes for meetings of the project's decision-making structures. The Report will also include the detailed project budget for the first full year of implementation and any M&E requirements to effectively measure project performance during the targeted 12 months.

(b) Annual Project Report (APR)

142. The APR is a UNDP requirement and part of UNDP's Country Office central oversight, monitoring, and project management. It is a self-assessment report by project management to the CO and provides input to the country office reporting process, as well as forming a key input to the Tripartite Project Review. An APR will be prepared on an annual basis prior to the Tripartite Project Review, to reflect progress achieved in meeting the project's AWP and assess performance of the project in contributing to intended outcomes through outputs and partnership work.

143. The format of the APR is flexible but should include the following:

- An analysis of project performance over the reporting period, including outputs produced and, where possible, information on the status of the outcome
- The constraints experienced in the progress towards results and the reasons for these
- The three (at most) major constraints to achievement of results
- AWP, Country Assistance Evaluation (CAE), and other expenditure reports generated
- Lessons learned
- Clear recommendations for future orientation in addressing key problems

(c) Project Implementation Review (PIR)

144. The PIR is an annual monitoring process mandated by the GEF. It has become an essential management and monitoring tool for project managers and offers the main vehicle for extracting lessons from ongoing projects. Once the project has been under implementation for a year, a Project Implementation Report must be completed by the UNDP Country Office together with the Project Management Unit. The PIR can be prepared any time during the year (July-June) and ideally prior to the TPR. The PIR should then be discussed in the TPR so that the result would be a PIR that has been agreed upon by the project, the executing agency, UNDP CO and the concerned Regional Coordinating Unit (RCU).

145. The individual PIRs are collected, reviewed, and analyzed by the RCUs prior to sending them to the focal area clusters at the UNDP-GEF headquarters. The focal area clusters supported by the UNDP-GEF M&E Unit analyze the PIRs by focal area, theme and region for common issues/results and lessons. The TAs and PTAs play a key role in this consolidating analysis.

146. The focal area PIRs are then discussed in the GEF Interagency Focal Area Task Forces in or around November each year and consolidated reports by focal area are collated by the GEF Independent M&E Unit based on the Task Force findings.

147. The GEF M&E Unit provides the scope and content of the PIR. In light of the similarities of both APR and PIR, UNDP-GEF has prepared a harmonized format for reference.

(d) Quarterly Progress Reports

148. Short reports outlining main updates in project progress will be provided quarterly to the local UNDP Country Office and the UNDP Regional Center in Bangkok by the PMU.

(e) Periodic Thematic Reports

149. As and when called for by UNDP, UNDP Regional Center or project financing partners, the PMU will prepare specific thematic reports, focusing on specific issues or areas of activity. The request for a thematic report will be provided to the project team in written form by UNDP and will clearly state the issue or activities that need to be reported on. These reports can be used as a form of lessons learnt exercise, specific oversight in key areas, or as troubleshooting exercises to evaluate and overcome obstacles and difficulties encountered. UNDP is requested to minimize its requests for thematic reports, and when such are necessary will allow reasonable timeframes for their preparation by the project team.

(f) Project Terminal Report

150. During the last three months of the project the project team will prepare the Project Terminal Report. This comprehensive report will summarize all activities, achievements and outputs of the Project, lessons learnt, objectives met, or not achieved, structures and systems implemented, etc. and will be the definitive statement of the Project's activities during its lifetime. It will also lay out recommendations for any further steps that may need to be taken to ensure sustainability and replicability of the Project's activities.

Independent Evaluations

151. The project will be subjected to at least two independent external evaluations as follows:

Mid-term Evaluation

152. An independent Mid-Term Evaluation will be undertaken at the end of the second year of implementation. The Mid-Term Evaluation will determine progress being made towards

the achievement of outcomes and will identify course correction if needed. It will focus on the effectiveness, efficiency and timeliness of project implementation; will highlight issues requiring decisions and actions; and will present initial lessons learned about project design, implementation and management. Findings of this review will be incorporated as recommendations for enhanced implementation during the final half of the project's term. The consultancy will be organized by the UNDP CO and the Terms of Reference for the mid-term evaluation will be prepared by the UNDP CO based on guidance from the Regional Coordination Unit and UNDP-GEF.

Final Evaluation

153. An independent Final Evaluation will take place three months prior to the terminal tripartite review meeting, and will focus on the same issues as the mid-term evaluation. The final evaluation will also look at impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental goals. The Final Evaluation should also provide recommendations for follow-up activities. The consultancy will be organized by the UNDP CO and the Terms of Reference will be prepared by the UNDP CO based on guidance from the Regional Coordination Unit and UNDP-GEF.

Learning and Knowledge Sharing

154. Results from the project will be disseminated within and beyond the project management cycle through a number of existing information sharing networks and forums. In addition:

- The project will participate, as relevant and appropriate, in UNDP-GEF sponsored networks, organized for senior personnel working on projects that share common characteristics. The **Adaptation Learning Mechanism (ALM)** will function as key electronic platform to capture project learning. The ALM lessons learned template will be adapted for use by the project. To support this goal, adaptation-related activities from the project will contribute knowledge to the ALM, such as the following:
- The project will identify and participate, as relevant and appropriate, in scientific, policy-based and/or any other networks, which may be of benefit to project implementation though lessons learned.
- The project will identify, analyze, and share lessons learned that might be beneficial in the design and implementation of similar future projects. Identifying and analyzing lessons learned is a continuous process, and the need to communicate such lessons as one of the project's central contributions is a requirement to be delivered not less frequently than once every 12 months. UNDP-GEF shall provide a format and assist the project team in categorizing, documenting and reporting on lessons learned. To this end a percentage of project resources will need to be allocated for these activities.
- The project will capture best practices in integrating adaptation into national and local development policy, and project design and implementation mechanisms.

- The project will capture lessons learned on removing the most common barriers to adaptation, with special attention to the roles of local partners, international partners, UNDP, and GEF in designing and implementing projects
- The project will capture conditions for success (or failure) in community-based adaptation, including conditions for replication and scaling up.
- The project will create synergies with other regional processes and projects (like PACC, IWRM) that have knowledge management components, in order to share the Tuvalu experience.

Table 3: Indicative Monitoring and Evaluation Work Plan and Corresponding Budget

Type of M&E activity	Responsible Parties	Budget US$ excluding project team staff time	Timeframe
Inception Workshop (IW)	National Project Manager (NPM) Project Manager (PM) UNDP Country Office (CO) UNDP-GEF Regional Coordination Unit (RCU)	$5,000	Within first two months of the appointment of NPD and Project Manager
Inception Report	NPM, Project Coordinator and PMU staff UNDP CO	None	Immediately following IW
Measurement of Means of Verification for Project Purpose Indicators	PM under close supervision of NPD will oversee the hiring of specific institutions and delegate tasks and responsibilities to relevant PMU members	To be finalized in Inception Phase and Workshop.	Start, mid and end of project
Measurement of Means of Verification for Project Progress and Performance (measured on an annual basis)	Project Board chaired by Secretary, MNRE; Project Board with oversight by UNDP CO and NPD; Measurement of progress conducted by Kaupule's	To be determined as part of the Annual Work Plan's preparation.	Annually prior to Annual Project Report/Project Implementation Review (APR/PIR) and to the definition of annual work plans
APR and PIR	PM and PMU staff UNDP-CO UNDP-GEF	None	Annually
TPR and TPR report	GEF OFP UNDP CO NPM	$5,000	Every year, upon receipt of APR
Project Board Meetings	NPM Project Board Members UNDP CO	None	Following Project IW and subsequently at least once a year
Annual status reports /seminar /workshop	NPM and PMU members	$5,000	To be determined by Project team and UNDP
Technical reports/ knowledge and advocacy material	MoEF, FD, NPM and PMU members, UNDP. External consultants as needed	$10,000	To be determined by Project Team and UNDP

Mid-term External Evaluation	NPM and PMU members UNDP-CO, UNDP-GEF RCU, External Consultants (i.e. evaluation team)	$20,790	At the mid-point of project implementation.
Terminal External Evaluation	NPM and PMU members UNDP-CO UNDP-GEF RCU External Consultants (i.e. evaluation team)	$20,790	At the end of project implementation
Lessons learned and shared at international level	PMU and UNDP	Will cover from Outcome 4	Yearly
Audit	FAPAD and UNDP	None	Yearly
Visits to field sites (UNDP staff travel costs to be charged to IA fees)	UNDP CO UNDP-GEF RCU (as appropriate) Project Board members	n/a, financed through IA fees	Yearly
TOTAL INDICATIVE COST **Excluding project team staff time and UNDP staff and travel expenses**		**USD 66,580**	

PART V: Legal Context

155. This document together with the CPAP signed by the Government of Tuvalu and UNDP which is incorporated by reference constitute together a Project Document as referred to in the SBAA [or other appropriate governing agreement] and all CPAP provisions apply to this document.

156. Consistent with the Article III of the Standard Basic Assistance Agreement, the responsibility for the safety and security of the implementing partner and its personnel and property, and of UNDP's property in the implementing partner's custody, rests with the implementing partner. The implementing partner shall:

    a) put in place an appropriate security plan and maintain the security plan, taking into account the security situation in the country where the project is being carried;
    b) assume all risks and liabilities related to the implementing partner's security, and the full implementation of the security plan.

157. UNDP reserves the right to verify whether such a plan is in place, and to suggest modifications to the plan when necessary. Failure to maintain and implement an appropriate security plan as required hereunder shall be deemed a breach of this agreement.

158. The implementing partner agrees to undertake all reasonable efforts to ensure that none of the UNDP funds received pursuant to the Project Document are used to provide support to individuals or entities associated with terrorism and that the recipients of any amounts provided by UNDP hereunder do not appear on the list maintained by the Security Council Committee established pursuant to resolution 1267 (1999). The list can be accessed via http://www.un.org/Docs/sc/committees/1267/1267ListEng.htm. This

provision must be included in all sub-contracts or sub-agreements entered into under this Project Document.

SECTION II: STRATEGIC RESULTS FRAMEWORK (SRF) AND GEF INCREMENT

PART I: Strategic Results Framework (SRF, formerly GEF Logical Framework)

Table 4: Strategic Results Framework for the Increasing Resilience of Coastal Areas and Community Settlements to Climate Change

Project Strategy	**Objectively verifiable indicators**				
Outcome/Output	**Indicator**	*Baseline*	*Target*	**Sources of verification**	**Risks and Assumptions**
Objective – Increase the protection of livelihoods in coastal areas and island communities from dynamic risks related to climate change and climate variability in all inhabited islands of Tuvalu	Number of households in Tuvalu that have increased capacity to anticipate and address climate change-induced risks through targeted adaptation measures	Coastal communities face climate change risks largely due to lack of adaptive capacity The country's responses to climate change risks and adaptation are ad hoc and piecemeal, and not adequately supported by legislation. Planners, policy makers, Kaupule, and vulnerable communities are unable to anticipate climate change impacts and integrate these into policy revision, financial planning and decision-making processes	By the end of the project, • at least 1000 households in Tuvalu are able to anticipate climate change-related risks and select the most effective risk reduction options • at least 75% of DoE and DoA officials and planners in other government agencies (DoF, Education, DoH, DMO, PWD) in Tuvalu and in the islands' Kaupule, and 100% of personnel in NGOs participating in the project (TANGO, NCW) are able to (i) identify climate-induced risks in coastal areas; (ii) prioritize and plan effective adaptation measures on the basis of participatory assessments; and (iii) sustain community awareness of climate change-related risk issues	Qualitative-based surveys (QBS) Interviews Environmental and CZM policy documents Coastal zone development plans developed by government Climate risk assessments conducted in each island NGO quarterly and annual reports End of project evaluation report	Stakeholders are able to perceive reductions in vulnerability over the time-scale determined by project duration Effective coordination between key government agencies exists Institutional linkages between agencies involved in the project and other relevant ministries and NGOs is functional and supportive Strong communication and information links with all island communities are built and sustained by government and NGOs

Project Strategy	**Objectively verifiable indicators**				
Outcome/Output	**Indicator**	*Baseline*	*Target*	**Sources of verification**	**Risks and Assumptions**
Outcome 1 – Enhanced capacity of public administration , Island Kaupules, communities and NGOs, with policy support to plan for and respond to climate change risks in coastal areas and settlements	Percentage of national planners, kaupule, and communities (respectively) in Tuvalu able to identify climate-related risks and prioritize, plan, and implement effective adaptation measures Number of coastal zone management – related policy documents formulated and approved as a result of the project Number of housing and/or infrastructure projects planned in coastal areas throughout Tuvalu that explicitly incorporate climate-resilient development as a result of the project	Coastal development planners currently take extreme events into account at the national, district, and local levels (e.g., through the Disaster Coordination Office), but planning for and reacting to dynamic climate change risks is ad hoc and piecemeal. There is a lack of an integrated framework and human and institutional capacity for assessing, planning for, and addressing climate change-induced risks at coastal areas or implementing integrated coastal zone management approaches at the national, kaupule, or community levels.	• By the end of the project, at least 75% of DoE and DoA national civil servant **staff**, representatives of Kaupule in all islands, and NGO staff involved in the project are able to identify climate risks and prioritize, plan, and implement community-based adaptation measures in coastal areas. • By the end of the project, at least 2 national policies or action plans on coastal management are revised to promote sustainable, climate-resilient development	Qualitative-based surveys (QBS) Interviews Training reports NGO Reports Records of Kaupule deliberations Policy documents	Appropriate staff members are selected for training by their host agencies and staff turnover does not negate training benefits DoE and DoA continue to support adaptation within coastal management programs, and to apply and maintain adaptive capacity built during the project Key government agencies including the Depts of Education and Health are partnering in the development of strong communication and awareness links between the national government and all island communities National Environment Council and Island Environment Committees are established Ministries and

Project Strategy	**Objectively verifiable indicators**				
Outcome/Output	**Indicator**	*Baseline*	*Target*	**Sources of verification**	**Risks and Assumptions**
					departments support establishment of National Climate Change Advisory Board (NCCAB)
Output 1.1 -- *Financial provisions are reflected in the national budget, public sector asset management plans, and National Development Plan for climate change risk management in coastal areas*.	Amount of funding programmed in the national government budget for climate change risk management in vulnerable coastal areas as a result of the project Number of project investments and infrastructure maintenance budgets by the national government revised to reflect climate-related risk Percentage of national sectoral planners with improved understanding of climate change risks and adaptation measures	Current government budgeting and project investment proposals lack recognition of climate risks Current capacity at the national level relevant to the integrated planning and management of climate change/ adaptation issues and CZM is limited to a core group of experts within the MNRE, MOH, Fisheries, and some NGOs. The members of the original NAPA team are no longer available.	• By the end of Year 1, 5 briefing notes prepared on specific climate-related risks in the islands with fact sheets identifying the specific physical, social, and environmental context of each risk • By end of Year 2, at least 3 maintenance budgets of Public Works Department revised to reflect climate risk reduction • By the end of Year 2, 2 national training seminars for relevant national ministries and organizations on climate-resilient coastal planning conducted (2 total) • By the end of the project, at least 80% of relevant national sectoral planners are able to anticipate climate change-induced risks in their professional sector and advocate/plan for suitable corresponding	Briefing notes, factsheets, and cross-sectoral guidelines Capacity assessment report, training reports, and QBS Interviews with government planning officials and budget administrators National Budget documents Annual and long term development plans of the relevant ministries and departments under MNRE, MOH, and MPUI	Concerned ministries and other stakeholders organizations are willing to participate and promote broader involvement of staff in capacity development initiatives Stakeholders relevant for decision and policy making in coastal zone management are correctly identified All ministries and departments actively support climate change activities and not restricted solely to MNRE

Project Strategy	**Objectively verifiable indicators**				
Outcome/Output	**Indicator**	*Baseline*	*Target*	**Sources of verification**	**Risks and Assumptions**
			adaptation measures		
Output 1.2 -- *A coastal zone management policy is developed and related t project plans and sector development strategies are modified to incorporate climate risk management provisions on the basis of specific climate risk scenarios.*	Number of new policy and/or legislative documents supporting integrated coastal zone management with an explicit focus on climate change risk Number of existing policy documents and sector development strategies reviewed against their effects of reducing or increasing climate change risk Number of national and kaupule officials able to maintain compliance with revised coastal zone management policies	Although there is a certain competence in disaster management, especially in response planning, the current capacity of national and kaupule officials is low with regard to climate change issues There has been no systematic examination of relevant coastal management policies' impacts regarding climate change resilience at the community level A new Environment Act is undergoing enactment, expected in 2009. The new Act provides for Environment Committees to be established on each island, under national coordination by MNRE..	• By the end of Year 1, 1 cross-sectoral guideline for climate-resilient coastal planning developed and disseminated to national and island level sector planners • By the end of Year 2, a new national policy prepared and implemented that supports integrated CZM • By the end of Year 3, a coastal zone development strategy incorporating climate change risk on the basis of specific scenarios developed for each island, based on baseline data collected on each island in the course of the consultations conducted in the first two years • By end of the project, at least 90% of target kaupule officials are familiar with climate-resilient policy developed under the project and able to facilitate implementation of the policies in their islands	Training reports and capacity assessment report Exposure visit reports QBS/Interviews Policy review reports Background notes and policy recommendations Climate resilient development guidelines	Appropriate government officials would be participating in capacity building events and the same officials will be able to attend all three seminars to fully benefit from the training series Integrated coastal zone management as an approach to dealing with climate change risk is successfully developed and conveyed to and accepted by coastal communities CBA measures will have produced replicable successes in time for exposure visits by district officials

Project Strategy	**Objectively verifiable indicators**				
Outcome/Output	**Indicator**	*Baseline*	*Target*	**Sources of verification**	**Risks and Assumptions**
			• By the end of the project, at least 2 coastal zone regulations promote resilient livelihoods and sustainability of protective systems		
Output 1.3-- *A National Climate Change Advisory Board is established, trained and resourced to support community-based adaptation planning and implementation in Tuvalu.*	Establishment of a National Climate Change Advisory Board (NCCAB) with broad community-based adaptation implementation/ coordination powers Number of national officials and kaupule representatives working on coastal management and able to support community-based adaptation Number of island development plans integrating climate-change resilience measures Number of civil society networks for climate change resilience, with activities effectively	Though there is a broad spectrum of government and non-government interest in climate change and adaptation in Tuvalu, there currently exists no central implementation/ coordination/ financing capacity for community-based adaptation or other responses to climate change risks.	• An NCCAB will be established by the end of Year 1 to oversee the project and to coordinate for facilitating community-based adaptation activities in Tuvalu. • By the end of Year 2, climate risk resilience considerations are integrated into at least 5 island development plans, approved by the NCCAB and the respective kaupule • By the end of Year 3, a civil society network is established in each of the 9 islands of Tuvalu. • By the end of the project, at least 80% of government officials and NGOs concerned with coastal management in Tuvalu report	QBS/Interviews Training reports Coastal development plans Independent evaluation reports Coastal development policies and planning documents Coordination meeting minutes	Government officials and other stakeholders are willing to support consolidation of responsibility for CBA and other responses to climate change risks in a central body (NCCAB) The NCCAB is adequately supported politically and financially by government At least 5 island development plans will be drafted (or climate change elements integrated into existing plans) during the first two years of the project Staff turnover in NCCAB and key stakeholder groups

Project Strategy	**Objectively verifiable indicators**				
Outcome/Output	**Indicator**	*Baseline*	*Target*	**Sources of verification**	**Risks and Assumptions**
	supported by NCCAB		comprehensive information support and improved coordination with other organizations in coastal management and planning		does not negate training benefits Champions exist in each island and kaupule who are willing to establish and maintain the civil society networks The political climate continues to support a civil society network National and island-level planners attend coordination meetings consistently to ensure continuous and effective information sharing
Output 1.4 -- *A national awareness and training campaign for local communities and kaupule is designed and implemented*	Number of vulnerable households trained on low cost, community-based options for climate risk reduction Number of island-level community groups for climate resilience planning	Notwithstanding recent success in mobilsing communities in the NAPA process and in coastal tree planting programs, current knowledge and capacity among communities is low with regard to addressing climate change issues Disaster preparedness and health protection programs (e.g. those	• By the end of Year 3, all households in vulnerable communities in all 9 of Tuvalu's islands are trained and able to assess, prioritize, and request support for the implementation of community-based adaptation measures • By the end of Year 3, 1 island-level climate change network established to raise community	Training reports Community surveys/ Household interviews Independent evaluation reports Public awareness and training materials Project progress report	Vulnerable people have the time and willingness to regularly attend capacity building events Champions exist in each community and kaupule who are willing to establish and maintain climate change networks The political climate

Project Strategy	**Objectively verifiable indicators**				
Outcome/Output	**Indicator**	*Baseline*	*Target*	**Sources of verification**	**Risks and Assumptions**
		implemented by DMO and MOH) for extreme events and epidemics have raised awareness of current risks from extreme climate events. However, there are no systematic climate change-related training and awareness activities currently being implemented in target communities	awareness of climate risk reduction, local participation, decision-making, and livelihood security in each island (9 total) • By the end of Year 3, culturally appropriate tools are developed to raise awareness on climate change impacts on coastal communities		continues to support a civil society network Community members continue to be willing to learn, disseminate, and use information in training and awareness materials
Outcome 2 – Enhanced capacity of local communities to adapt to dynamic climate-related threats through implementation of practical community-based adaptation measures specifically tailored to each islands	Number of locally designed, sustainable adaptation measures demonstrated in vulnerable coastal communities Percent of households in Tuvalu that are participating in the implementation of community-based adaptation measures	Disaster management efforts have increased preparedness for extreme events in some areas; however, there is a lack of planned measures and structured analysis of options to implement integrated coastal zone management and adapt to a broad range of both extreme events and gradual climate change–induced hazards in coastal areas Communities currently lack awareness, physical and financial resources, and leadership to anticipate climate change risks and implement	• By end of the project, over 80% of the community-based adaptation measures employed by the project demonstrate their utility for coastal communities and provide lessons for replication	Project progress reports Formal M&E protocols of the project (under Outcome 3) Evaluation reports	Communities continue to be supportive of soft adaptation measures Networks between national organisations (government and non-government) and local communities providing information, training, and management support for project initiation are built and sustained Communities are receptive to project efforts and voluntarily explore options for replicating and expanding them

Project Strategy	**Objectively verifiable indicators**				
Outcome/Output	**Indicator**	*Baseline*	*Target*	**Sources of verification**	**Risks and Assumptions**
		adaptive solutions			Mangrove and non-mangrove species chosen for afforestation can thrive in project sites Salt-tolerant crop species that are agriculturally suitable for Tuvalu are available and affordable
Output 2.1 – *Community-based adaptation plans for coastal protection, water supply security, and agricultural livelihood sustainability are developed for all islands in Tuvalu..*	Number of local risk assessments prepared by communities, NGOs, and outside experts disseminated to sectoral planners Number of community-based adaptation plans developed with active participation of local communities for mangrove and non-mangrove afforestation, livelihood diversification, agricultural diversification, and security of fresh water supply	Community-level adaptation plans to deal with climate change risks do not exist in target islands; Kaupule lack sufficient information and awareness to spearhead and coordinate community-based adaptation in the islands Adequate networks for community-based adaptation in the islands do not exist The full range of practical community-based adaptation options in each island is not known	• By the end of Year 1, at least 1 community-level risk assessment from each island will be available to national government and NGOs for dissemination and use in the planning of future projects • By the end of Year 1, at least 1 community-based adaptation plan for coastal protection, water supply security, or agricultural diversification is developed in each island (9 total) and supported by detailed baseline data for each island. • All community-based adaptation plans developed under the project identify	Risk assessment reports Community-based adaptation plans Reports describing community involvement in the process, including: vulnerability and needs assessment reports, feasibility reports, assessment methodologies, and maps	Communities are willing to participate and contribute in the assessment and design process of developing community-based adaptation plans National agencies including NGOs (via the NCCAB) extend required assistance to kaupule and communities

Project Strategy	**Objectively verifiable indicators**				
Outcome/Output	**Indicator**	*Baseline*	*Target*	**Sources of verification**	**Risks and Assumptions**
			and prioritize suitable community-based adaptation projects for implementation and replication		
Output 2.2 – *Community-based adaptation projects with a focus on participatory management of protective ecosystems and climate-sensitive natural resources are designed and implemented in at least 1 pilot site on each of Tuvalu's 9 islands*	Number of hectares of mangrove and non-mangrove species planted and continuously maintained by communities Number of people trained and participating in mangrove nursery and maintenance Number of households benefiting from improved water storage Number of pulaka pits and breadfruit cultivation areas protected from high soil salinity	Coastal afforestation programs have begun under UNCCD and AusAID assistance, though they are not mutually well coordinated; Measures to ensure the sustainability of coastal mangroves and other protective species not implemented, and the potential for protection against climate change-induced hazards is not fully realized Staple crops are damaged by increasingly saline groundwater induced by climate change; communities have no means or knowledge to address the problem	By the end of the project, • Model demonstration projects of planting mangrove and non-mangrove species planted and maintained by communities in at least 5 atolls (Funafuti, Nukufetau, Niutao, Nukulaelae, and Niulakita • At least 100 m3 of fresh water supply and water storage systems capacity provided to support agriculture in at least 4 atolls (Nanumea, Nui, Vaitupu, and Nanumaga) • At least 12 plantations of pulaka, breadfruit, and banana cultivation are protected from saline groundwater in at least 3 atolls (Nanumea, Nui, and Nanumaga) • By the end of the project, 80% of households in all vulnerable communities	Project progress reports Field visit reports Photographic documentation Independent evaluation reports Inventory stock list of equipment provided through the project (e.g. seedlings, rainwater tanks) Training protocols	Communities are willing to participate in coastal afforestation and agricultural activities. A sufficient number of seedlings survive the nursery stage and can be planted Rainfall in affected islands is sufficient to make measures to protect crops from saline groundwater effective Land for the pilot areas is not lost to an extreme event during the project Vessel transport available to deliver water tanks

Project Strategy	**Objectively verifiable indicators**				
Outcome/Output	**Indicator**	*Baseline*	*Target*	**Sources of verification**	**Risks and Assumptions**
			have participated in the implementation of community-based adaptation activities financed by the project		
Output 2.3 – *The results of all community-based demonstration projects are analysed and fed into the formulation of a government-endorsed replication programme*	Number of community-based adaptation projects that are designed and financed on the basis of analysis and lessons learned from this project Number of follow-up/replication projects within Tuvalu that are designed and financed on the basis of project lessons	Livelihood programs are ongoing in some coastal areas (e.g. in-shore Fisheries, Agriculture); however, they do not take climate change impacts into account in a systematic way and are not closely aligned with afforestation measures or with integrated CZM	• By Year 2, all vulnerable communities in the 9 target islands are actively adopting means to protect and/or diversify their livelihood options • Lessons learned through the project are applied by government and NGOs in the formulation of future adaptation and risk reduction projects on all islands • A project replication strategy is developed and disseminated to senior government planners in key Ministries (e.g., Public Utilities, Health, and Education, NGOs, and island kaupules • At least 2 follow-up/replication project within Tuvalu are designed on the basis of project lessons	Field surveys QBS, Interviews Agriculture reports End of Project reports New project proposals and plans (government and non-government) Project replication strategy document	Natural resources required for livelihood options are not damaged in extreme events Government and NGOs continue to provide coastal livelihood support Climate-resilient livelihood options provide at least as much income as non-climate-resilient options

Project Strategy	**Objectively verifiable indicators**				
Outcome/Output	**Indicator**	*Baseline*	*Target*	**Sources of verification**	**Risks and Assumptions**
Outcome 3 – Project knowledge and lessons learned are captured, analysed and disseminated to facilitate replication of practical adaptation solutions in all islands	Number of project proposals, publications and policy documents that incorporate learning from the project Number of project lessons shared in national and international fora on climate change	Development projects currently do not systematically benefit from learning practices and project lessons on community-based adaptation.	• By the end of the project, at least 4 proposed or ongoing coastal afforestation, livelihoods, or adaptation projects in Tuvalu and the Pacific region draw on lessons and knowledge generated through the project	ALM platform Project documents, annual reports from development agencies Publication documents	Circumstances in coastal areas of Tuvalu apply to other coastal afforestation, livelihoods, and community-based adaptation initiatives
Output 3.1 – *Climate change risk projections and scenarios for Tuvalu are analysed, updated and disseminated to sectoral planners and policy makers*	Number and quality of regional climate change scenarios available for Tuvalu Number of new Climate Change research projects initiated as a result of the project	Although some discrete vulnerability and climate risk assessments are prepared on behalf of Tuvalu, climate change risk projections are not routinely updated or integrated into planning processes Communities and NGOs lack financial and human resources to undertake baseline vulnerability assessments in disparate communities; networks providing feedback to national agencies from even informal assessments are not well developed Although baseline data preparation is underway	• By the end of year 1, institutional links between the Project Board and NCCAB and international climate modelling groups doing work relevant to Tuvalu are firmly established • Existing Climate Change scenarios for Tuvalu are reviewed and analysed for information gaps. • By the end of year 2, information gaps on climate change modelling for Tuvalu are addressed by different research groups active in the Pacific region • At least 3 new research initiatives for coastal	Climate change impact projections and scenarios (tables and maps) Local socio-economic vulnerability assessment reports Proceedings of local and international climate change workshops and other relevant events that refer to the situation in Tuvalu Publication of relevant baseline data and related reports	Government and NGOs assist communities to raise awareness of climate change risk issues Baseline data can be collected in a timely fashion to enable strengthening of the socio-economic aspects of climate change impact assessments A critical number of research institutions continues to be interested in climate change research pertaining to the situation in low lying atoll nations in the Pacific region

Project Strategy	**Objectively verifiable indicators**				
Outcome/Output	**Indicator**	*Baseline*	*Target*	**Sources of verification**	**Risks and Assumptions**
		or proposed by government agencies and NGOs, much of this work is unfunded; there is currently little baseline data related to climate risk on which to base detailed vulnerability assessments	adaptation draw on knowledge gaps identified during the project. • By the end of year 2, updated climate change scenario and modelling information is disseminated to all sector planners and NGOs in Tuvalu that are engaged in coastal zone management and development		
Output 3.2 – *Lessons learned from community-based adaptation projects are collated and disseminated to communities, sectoral planners and policy makers on a continuous basis*	Number of organizations and individuals actively involved in the transfer of project-related knowledge within and outside of Tuvalu Number of workshops organized to disseminate knowledge generated through the project	No systematic knowledge transfer on coastal afforestation and climate-resilient livelihoods initiatives within Tuvalu and from Tuvalu to other countries Although a number of workshops have been held in recent years on the subject of national vulnerability to climate change, no workshop has been held nationally or internationally drawing on lessons learned from climate change adaptation practices and projects in Tuvalu	• By the end of the project, 1 national and 1 international workshop on coastal afforestation and other climate-resilient livelihoods conducted (2 total) • A project website is established and routinely updated, capturing results from community-based adaptation planning, implementation of adaptation options and providing an entry point for technical and financial support to communities	Workshop proceedings Website Website traffic protocols	Other regions recognize the value of experiences derived from the project Communities continue to have internet access International fora are receptive to learning from Tuvalu's experience
Output 3.3 – *Project lessons are*	Number of contributions by the	No contribution by Tuvalu to the ALM on	• By the end of the project,all project reports	ALM platform Project documents	The ALM is operational to

Project Strategy	**Objectively verifiable indicators**				
Outcome/Output	**Indicator**	*Baseline*	*Target*	**Sources of verification**	**Risks and Assumptions**
shared within and outside of the Pacific region and incorporated into the Adaptation Learning Mechanism (ALM)	project to the ALM Number of follow-up/replication projects outside of Tuvalu designed on the basis of project lessons Number of research initiatives based on project insights and lessons	coastal afforestation and other CBA initiatives No coastal afforestation and coastal afforestation, livelihoods, and CBA initiatives within or outside Tuvalu have drawn on lessons from the project	are screened for relevant input to the ALM • All key project lessons are captured and disseminated through the ALM • At least 2 follow-up/replication project outside of Tuvalu are designed on the basis of project lessons	Research papers in national and international circulation	facilitate learning Project lessons apply to proposed or ongoing coastal afforestation, livelihoods, and CBA initiatives in other regions within and outside Tuvalu

PART II: Additional Cost Analysis

Project Background

159. The most significant impacts of climate change in Tuvalu are the increased incidence of cyclones, storm surges, inundation, salinity intrusion due to sea level rise, and the increase in temperatures and precipitation. Coastal inundation with increased salinity adds new dimensions of risk to the coastal zones, which further intensifies threats to lives, livelihoods, and development initiatives. Scientific studies, the Initial National Communication, and NAPA show that coastal areas are already being affected by climate change-induced hazards. The components of the proposed project comprise the most urgent priorities from the NAPA process in Tuvalu.

Additional Cost Assessment

Baseline

160. Coastal afforestation with mangrove and non-mangrove species has been implemented on a piecemeal basis, both informally and through government and NGO programs, but several key elements to ensure their sustainability as protective ecosystems have not been adequately incorporated. These elements include community involvement in the design and implementation of initiatives, selecting species that are resilient to climatic risks, and integrating afforestation with livelihoods and other vulnerability reduction measures. Coastal communities are directly exposed to climate change impacts largely due to significant capacity gaps to effectively identify climate risks and develop and implement adaptation measures at the national, and local levels in Tuvalu. Although coastal management and land use policies exist to a limited extent, they are not yet geared towards dealing with climate change.

Additional Cost Reasoning

161. Recognizing the current capacity deficits to address new risks emerging from climate change, the Government of Tuvalu seeks to integrate long-term climate risks into the existing coastal management framework and readjust it with a view towards greater effectiveness and longer-term planning. The project will also implement practical and replicable measures for reducing climate change-induced risks in coastal areas, as well as strengthening the national institutional framework to address climate change. The lessons learned will facilitate replication in other vulnerable coastal areas, both within Tuvalu and elsewhere in the South Pacific.

162. Community vulnerability will be reduced as the project will catalyze cost-effective coastal protection including afforestation and ‘soft technology coastal protection, sustainable livelihoods through protection of agricultural productivity, and support to protecting the communities’ water supplies. From the national to local administrative levels, the project will strengthen technical capacity and the institutional framework to anticipate climate change risks and to design and implement adaptation initiatives.

Through the project, coastal management and development policies will promote climate-resilient coastal development.

Systems Boundary

163. The project targets vulnerable coastal communities in all islands in Tuvalu, where community-based adaptation activities will be carried out. Activities include community-based coastal protection by planting mangrove and non-mangrove species and use of 'soft coastal protection technologies, introducing salt and drought resistant pulaka species and crop production techniques, and enhancing fresh water storage capacity for communities. Capacity building activities will target national and local sectoral planners within the government and civil society. Policy level interventions will take place at the national level, with input from local communities. The project does not include substantial infrastructural projects such as permanent concrete or rock breakwaters for coastal protection, early warning systems, or attempts to introduce new potential livelihoods beyond those traditionally pursued in the islands (subsistence agriculture and fishing, and handicrafts) that would depend on the creation of new markets in the islands.

Table 5: Summary of Adaptation Benefits and Costs

Cost/Benefit	Baseline (B)	Alternative (A)	Project and Additional costs (A-B)
Adaptation Benefits	There is a general lack of knowledge, skills and experience at all levels of government and civil society to access and interpret climate risk information and devise long-term risk reduction and adaptation strategies. There are no comprehensive coastal zone management policies in place, and regulations that do relate to the environment or to coastal development do not systematically incorporate climate risk considerations. Island communities throughout Tuvalu are suffering from increasingly severe coastal erosion, deteriorating security of the fresh water supply, and loss of agricultural livelihoods due to salt water intrusion. Some communities have recently been engaged by NGOs and the GoT to combat coastal erosion through 'greenbelt' tree planting programs, and all communities have benefited from past efforts to increase water storage capacity. However, the islands still lack strong civil society networks to support community action, public and official awareness of climate change risks and vulnerabilities is low, and there is lack of means to assess the risks and to design and implement effective means to counter them. Government planners lack the means to design development strategies that will help make the communities resilient to changing environmental conditions in the long term.	Improved government capacity at all levels to understand dynamic, climate-induced hazards and to design, implement, evaluate and replicate systems for climate change risk reduction and preparedness in coastal zone development, water management and agricultural production. The project will generate a valuable body of experience with community-based adaptation for dissemination to national sector planners and interested international stakeholders, and increase the general awareness of public officials (including planners, political leaders, and educators), farmers, and households about climate-related risks. Community capacity to respond to climate risks will be increased on the basis of systematic public awareness activities and networking. Communities in all islands will be better organized to design and prioritize effective community-based adaptation projects. The GoT will be able to draw on pilot experiences and a strong knowledge base on climate change impacts to make climate-resilient policy decisions and re-orient budget allocations to reduce key long-term vulnerabilities in all islands that affect coastal communities, coastal infrastructure and housing, and the agricultural sector.	
COSTS			
Outcome 1: Enhanced capacity of public administration, Island Kaupules, communities and	Capacity within national, island, and community level institutions and individuals to plan for and respond effectively to climate change vulnerabilities in coastal areas, including mobilisation of community actions, is limited. Civil society networks and links between national institutions, island kaupule, and coastal communities are weak.	Establishment of a National Climate Change Advisory Board and development of climate-aware policy for coastal zone management and adaptation, together with capacity building and training for climate-awareness for public officials at the national and island levels will ensure climate risk-resilient coastal planning, development, and	

Cost/Benefit	Baseline (B)	Alternative (A)	Project and Additional costs (A-B)
NGOs, with policy support to plan for and respond to climate change risks in coastal areas and settlements	There are major planned initiatives in climate-resilient water sector and erosion management policy development, and participatory training and awareness in all islands. Baseline projects: EDF 10 and JST-JICA (policy development) and UNDESA (participatory training and awareness) *Co-financing: $1,670,000*	project implementation. Public awareness, training, and development of civil society networks at the community level will result in information-sharing, networking and increased capacity to respond to climate risks on the part of community leaders and households and to take appropriate steps to reduce the exposure of vulnerable livelihoods to adverse climate-related trends and events. *Alternative: $2,254,800*	*LDCF: $584,800*
Outcome 2: Enhanced capacity of local communities to adapt to dynamic climate-related impacts and risks and to protect their livelihoods through implementation of practical community-based adaptation measures specifically tailored to each islands	Communities in all islands of Tuvalu are becoming increasingly vulnerable to climate-related threats to the habitability of the islands and to their livelihoods. Salt water has intruded into the fresh water lens of many islands, posing a direct threat to the cultivation of food staples. Communities lack the basic resources to organize themselves and coordinate grassroots efforts to protect local infrastructure and communal amenities (especially the potable and the agricultural water supply). There is no coordinated approach to assist communities to deal with climate-related risks, leaving communities isolated, with inadequate access to knowledge of climate risks and adaptation, and largely without confidence or resources to address the risks. Current projects currently support tree-planting in some islands and there is a substantial effort to address advanced coastal erosion and rehabilitation of damaged areas throughout Tuvalu, and to increase the capacity of community and household water storage capacity and to ensure sustainability by supporting indigenous fabrication of water tanks. There is also a project to assess groundwater resources in all outer islands. Baseline projects: JICA (assessment and rehabilitation of damaged coastal areas), EDF 10 (outer island rainwater tanks), and AusAID (indigenous tank fabrication and groundwater assessments)	Development of community-based adaptation plans with community participation for all islands in Tuvalu will ensure that communities are equipped with the tools that they need to implement adaptation solutions in a timely manner and utilising their own capacities. The installation of community-based adaptation demonstration projects on each island under the project will ensure that communities build up a body of experience that will inform their planning for and prioritisation of future adaptation projects and measures to protect their livelihoods. In support of this, the project will conduct a risk assessment for each community in the project area (covering coastal erosion and storm surge vulnerability, livelihoods, and the water supply) and undertake a thorough analysis of the appropriate mix and design of community-based coastal protection measures specific to each site.	

Cost/Benefit	Baseline (B)	Alternative (A)	Project and Additional costs (A-B)
	Co-financing: $2,500,000	*Alternative: $4,704,600*	*LDCF: $2,204,600*
Outcome 3: Project knowledge and lessons learned are captured, analysed and disseminated to facilitate replication of practical adaptation solutions in all islands	There is currently no coordinated, integrated capacity in Tuvalu to keep up to date with climate change assessments or to learn from experience overseas with community-based adaptation projects. There is similarly no capacity for the routine dissemination of lessons from Tuvalu's ground-breaking experience with community-based adaptation, during and after the project is implemented *Co-financing: $0*	Development of a systematic means to collect, analyse and disseminate lessons learned from the project, to national and international fora. Development of capacity to receive, interpret and update climate assessments and projections. Conduction of national and international workshops on community-based adaptation from the perspective of Tuvalu's experience. Development of a government operated and maintained website to keep the country and the world informed of the status of and lessons learned from the community based adaptation project in Tuvalu. *Alternative: $180,600*	*LDCF: $180,600*
Project Management	*Co-financing: $330,000 (GoT in-kind)*	*Alternative: $660,000*	*LDCF: $330,000*
TOTAL COSTS	**Co-financing: $4,500,000**	**Alternative: $7,800,000**	**LDCF: $3,300,000**

SECTION III: TOTAL BUDGET AND WORKPLAN

164. The financing instrument for the funding component related to the adaptation alternative displayed in the Additional Cost Matrix will be the LDCF. The proposed total project cost is **US$6,600,000,** out of which US$ 3,300,000 is proposed from the LDCF. The total amount of cash financing available to cover the additional costs related to climate change in this project is therefore US$ 3,300,000 (detailed in the budget table below).

165. It needs to be noted that as a result of the PPG phase, the geographical and technical extent of the project has been expanded to 9 islands and 3 different spheres of adaptation measures (coastal protection, freshwater management and agricultural management). This diversification has necessitated an increase of 10% in the project budget, compared to the approved PIF. This increase of 10% (amounting to 300,000.- USD) is in line with LDCF guidelines and deemed necessary to ensure development impact of the project.

166. Co-financing amounting to US$ 3,300,000 is secured from the Government of Tuvalu (US$ 0.33 million in kind and US$ 4,170,000 in parallel funding).

167. Following the standard practice of UNDP to ensure national, regional and international exchange of adaptation experience generated through the project, a learning and knowledge management component is added to monitoring and evaluation activities, which acts as a communication and learning interface to facilitate exchange and replication of project experiences within Tuvalu and in other countries facing similar coastal zone adaptation issues is included, in order to strengthen sustainability and visibility of the project beyond its lifetime. Without this component, the project would not be able to ensure a strong contribution to the regional and international dialogue on good adaptation practices in LDCs.

Table 6: Total Budget and Work Plan

Award ID **Project ID**	00058214 00072222
Award Title	Increasing Resilience of Coastal Areas and Community Settlements to Climate Change in Tuvalu
Business Unit	FJI10
Project Title	Increasing Resilience of Coastal Areas and Community Settlements to Climate Change in Tuvalu
Implementing Partner	Ministry of Natural Resources and Environment (MNRE)
Lead Coordinating Agency	Department of Environment, Ministry of Natural Resources and Environment (MNRE)
Other Implementing Partners	Ministry of Agriculture; Ministry of Works; and Department of Lands and Surveys

GEF Outcome/ Atlas Activity Outcome 1: Enhanced capacity of public administration , Island Kaupules, communities and NGOs, with policy support to plan for and respond to climate change risks in coastal areas

Responsible Party	**Fund ID**	**Donor**	**Atlas Budgetary Account Code**	**Services Description**	**Amount Year 1**	**Amount Year 2**	**Amount Year 3**	**Amount Year 4**	**Total (USD)**	**Budget Note**
MNRE	62160	LDCF	71300	Contractual Services-Companies (Local Inputs for CZM planning and implementation)	10,000	10,000	10,000	-	**30,000**	1.1
	62160	LDCF	71300	Contractual Services-Companies (Develop Integrated CZM Policy and incorporate Sectoral Coastal Policy to Promote Climate Change Adaptation)	25,000	25,000			**50,000**	1.2
PMU	62160	LDCF	74500	Sundry (PMU and Project Related Government Staff)	1,200	1,200	1,200	1,200	**4,800**	1.3

MNRE	62160	LDCF	71200	Contractual Services-Companies (Training Material Development, including capacity building for establishment of NCCAB)	40,000	20,000	-	-	**60,000**	1.4
PMU	62160	LDCF	71200	Contractual Services-Companies (Conduct Capacity Building Training)	40,000	40,000	-	-	**80,000**	1.5
	62160	LDCF	71200	Training/Seminar (Design and Conduct Training and Community Awareness at Island Level)	-	80,000	80,000	80,000	**240,000**	1.6
	62160	LDCF	71300	Consultancy Services-Individual (4 Community Organizers for local level capacity development and creation of civil society networks)	-	40,000	40,000	40,000	**120,000**	1.7
Sub-total					**116,200**	**216,200**	**131,200**	**121,200**	**584,800**	
GEF Outcome/Atlas Activity Outcome 2: Enhanced capacity of local communities to adapt to dynamic climate-related impacts through implementation of practical community-based adaptation measuresspecifically tailored to each islands										
Responsible Party	**Fund ID**	**Donor**	**Atlas Budgetary Account Code**	**ATLAS Budget Description**	**Amount Year 1**	**Amount Year 2**	**Amount Year 3**	**Amount Year 4**	**Total (USD)**	**Budget Note**
MNRE	62160	LDCF	71200	Consultancy Services-Individual (Climate Change Adaptation and Resilient Livelihood Expert)	40,000	40,000	40,000	-	**120,000**	2.1

	62160	LDCF	71300	Community-based adaptation Demonstration Projects: Funafuti	160,000	160,000	160,000	150,000	**630,000**	2.2
	62160	LDCF	71300	Community-based adaptation Demonstration Projects: Nanumea	30,000	40,000	40,000	40,000	**150,000**	2.3
	62160	LDCF	71300	Community-based adaptation Demonstration Projects: Vaitupu	40,000	51,000	50,000	50,000	**191,000**	2.4
	62160	LDCF	71300	Community-based adaptation Demonstration Projects: Nui	50,000	51,000	50,000	50,000	**201,000**	2.5
	62160	LDCF	71300	Community-based adaptation Demonstration Projects: Nukufetau	50,000	51,000	50,000	50,000	**201,000**	2.6
	62160	LDCF	71300	Community-based adaptation Demonstration Projects: Niutao	50,000	51,000	35,000	25,000	**161,000**	2.7
	62160	LDCF	71300	Community-based adaptation Demonstration Projects: Nukulaelae	50,000	51,000	35,000	25,000	**161,000**	2.8
	62160	LDCF	71300	Community-based adaptation Demonstration Projects: Niulakita	25,000	10,000	10,000	10,000	**55,000**	2.9
	62160	LDCF	71300	Community-based adaptation Demonstration Projects: Nanumaga	35,000	50,000	50,000	50,000	**185,000**	2.10
	62160	LDCF	71300	Travel and per diem for PMU, Government and NGO Officials	15,000	15,000	15,000	15,000	**60,000**	2.11

	62160	LDCF	71200	Contractual Services-Companies (Climate-Resilient Crop Livelihood Options and introduction of salt-tolerant species)	40,000	20,000	20,000	-	**80,000**	2.12
	62160	LDCF	74500	Sundry (PMU Staff, NGO Staff, and Project Related Government Staff)	2,400	2,400	2,400	2,400	**9,600**	2.13
Sub-total					**587,400**	**592,400**	**557,400**	**467,400**	**2,204,600**	
GEF Outcome/Atlas Activity Outcome 3: Project knowledge and lessons learned are captured, analysed and disseminated to facilitate replication of practical adaptation solutions in all islands										
Responsible Party	**Fund ID**	**Donor**	**Atlas Budgetary Account Code**	**ATLAS Budget Description**	**Amount Year 1**	**Amount Year 2**	**Amount Year 3**	**Amount Year 4**	**Total (USD)**	Budget Note
	62160	LDCF	71200	Consultancy Services-Individual (M&E Expert)	-	20,000	20,000	20,000	**60,000**	3.1
	62160	LDCF	71300	Consultancy Services- Individual (Local Level Monitoring and Evaluation of Community Based Adaptation Activities)	-	10,000	10,000	10,000	**30,000**	3.2
PMU	62160	LDCF	71300	Consultancy Services-Individual (MIS Specialist, including website development and maintenance)	10,000	10,000	10,000	-	**30,000**	3.3
PMU	62160	LDCF	71600	National workshops/ seminars and participation in international	-	20,000		20,000	**40,000**	3.4

				workshop/ seminar/ conference						
PMU	62160	LDCF	72400	Printing and Video Preparation	5,300	5,300	5,000	5,000	**20,600**	3.5
Sub-total					**15,300**	**65,300**	**45,000**	**55,000**	**180,600**	
GEF Outcome/Atlas Activity Project Management										
Responsible Party	**Fund ID**	**Donor**	**Atlas Budgetary Account Code**	**ATLAS Budget Description**	**Amount Year 1**	**Amount Year 2**	**Amount Year 3**	**Amount Year 4**	**Total (USD)**	Budget Note
	62160	LDCF	71400	Project Coordinator (full time, 1)	25,000	25,000	25,000	25,000	**100,000**	4.1
PWD	62160	LDCF	71400	Works Supervisor (1)	20,000	20,000	20,000	20,000	**80,000**	4.2
PMU	62160	LDCF	71400	Office Administrative Assistant (1)	10,000	10,000	10,000	10,000	**40,000**	4.3
	62160	LDCF	72500	Expendable Equipment (Stationary, paper, consumables, etc)	5,000	5,000	5,000	5,000	**20,000**	4.4
	62160	LDCF	72200	Non-expendable Equipment (PC and other office equipment)	15,000	-	-	-	**15,000**	4.5
	62160	LDCF	72000	Meeting Costs and Fees	1,420	2,000	2,000	2,000	**7,420**	4.6
	62160	LDCF	72500	Reports- Printing	1,500	1,500	1,500	1,500	**6,000**	4.7
MNRE, UNDP	62160	LDCF	74000	Indicative Monitoring (Inception Workshop, Mid-term and Terminal External Evaluation etc)	15,395	15,395	15,395	15,395	**61,580**	4.8

Sub-total		**93,315**	**78,895**	**78,895**	**78,895**	**330,000**	
TOTAL- 62160 (LDCF)		**812,215**	**952,795**	**812,495**	**722,495**	**3,300,000**	

SUMMARY

LDCF	3,300,000
Parallel Funding	4,170,000
Government (in kind)	330,000
TOTAL	7,800,000

Table 7: Budget Notes

Outcome 1	**Rationale**	**Description of Items**
1.1	Local consultant to coordinate local stakeholder inputs to the development of CZM policy, planning, and implementation	Local consultant technical services and stakeholder consultation activities
1.2	CZM expert to develop integrated CZM policy, incorporating climate change in coastal zone land management	Technical services procured to develop and assist implementation of climate-resilient coastal zone management policy throughout Tuvalu
1.3	Sundry expenses, supporting stakeholder consultations and policy development activities	Meeting venues, materials, public notifications
1.4	Expert to develop materials for capacity building and training of government and NGO officials in climate change awareness and resiliency, and for establishment of NCCAB	Development of the materials for the capacity building and training program for NCCAB and government and NGO officials in climate awareness in public policy and budgets
1.5	Conduct of capacity building and training for government and NGO officials	Training seminars for officials, focus-group discussions, and one-on-one consultations with key officials
1.6	Experts for the design and conduct of training and public awareness of climate change and risks and adaptation at the community level, all islands (linked with 1.9 below)	Training and public awareness in climate change awareness and adaptation for communities in all islands
1.7	4 community organizers to assist development of civil society networks in all islands, to support public awareness and capacity building	Community organizers will visit and stay as required on all islands to help establish civil society networks with strong links to the national government, NGOs, and international organizations
Outcome 2	**Rationale**	**Description of Items**
2.1	Resilient livelihoods and adaptation expert to assist in identification and design of future community-based adaptation projects	Technical services procured to prepare an adaptation plan for each island with community participation, assess vulnerable livelihoods, and program future community-based adaptation responses to be implemented under the project and in the future
2.2	Community-based adaptation Demonstration Projects: Funafuti	Erosion protection at Tepuka: mangroves and Elcorock seawall and other projects planned during Year 1
2.3	Community-based adaptation Demonstration Projects: Nanumea	Household and Community water tanks for water supply security and agriculture (irrigation) and other projects planned during Year 1
2.4	Community-based adaptation Demonstration Projects: Vaitupu	Tanker and support for water supply security and other projects planned during Year 1
2.5	Community-based adaptation Demonstration Projects: Nui	6 Community water tanks for domestic and agriculture use and other projects planned during Year 1
2.6	Community-based adaptation Demonstration Projects: Nukufetau	Mangroves and seawall for coastal protection and reclamation of eroded area and other projects planned during Year 1
2.7	Community-based adaptation Demonstration Projects: Niutao	Mangroves for coastal protection; restoration of pulaka pits; introduction of salt-tolerant species and other projects planned during Year 1
2.8	Community-based adaptation	Urgent erosion stabilisation; coastal protection with

	Demonstration Projects: Nukulaelae	mangroves and elcorock seawall and other projects planned during Year 1
2.9	Community-based adaptation Demonstration Projects: Niulakita	Coastal erosion protection; rehabilitation of fish pond and other projects planned during Year 1
2.10	Community-based adaptation Demonstration Projects: Nanumaga	Increase water storage substantially for drought protection and irrigation; plant mangroves for coastal protection; rehabilitate seawall; rehabilitate pulake pits; introduce salt-tolerant species and other projects planned during Year 1
2.11	Travel and per diem for government and NGO officials as consultants as required for project monitoring to ensure sustainability of project and effective engagement of communities	Travel costs to conduct liaison and supervisory functions (15 person-trips per year)
2.12	International expert to advise on technical agricultural livelihood options and introduction of salt-tolerant species	Technical services procured to advise NCCAB, PMU, government officials, NGOs, and communities on technical options to protect agricultural livelihoods, including through introduction of salt-tolerant species and procurement
2.13	Sundry expenses for government and NGO staff, supporting monitoring and supervisory functions	Meeting venues, materials, public notifications
Outcome 3	**Rationale**	**Description of Items**
3.1	International expert for Monitoring and Evaluation	Technical services procured to assist NCCAB and PMU to systematise monitoring and evaluation of the project, to feed into lessons learned for dissemination
3.2	Local consultant for Monitoring and Evaluation	Local services procured to assist ongoing functions related to monitoring and evaluation
3.3	International MIS specialist	Technical services procured to assist with MIS functions and development of a government website for knowledge dissemination
3.4	National and international workshops and seminars	Design, preparation, and conduct by government and NGO officials with island participation of national and international wks and conferences to disseminate and discuss lessons learned from the project
3.5	Printing and video preparation	Expenditures related to report and publication printing, and preparation of video materials for use in conferences and in general dissemination of lessons learned
Project Management	**Rationale**	**Description of Items**
4.1	Project Coordinator (head of PMU)	Salary costs
4.2	Works Supervisor	Salary costs
4.3	Office Administrative Assistant	Salary costs
4.4	Expendable Equipment	Project-related consumables (stationery, printer consumables, etc)

4.5	Non-expendable equipment	Project-related computers, printers, scanner/fax machines, modems, networking equipment, etc.
4.6	Meetings/Conferences and Related Costs	Costs of meeting/conference preparation, hire of venue and equipment, publicity, etc
4.7	Printing of qualitative project management documentation, manuals, products, and reporting	Printing of project management manuals, data sets, training material to produce reports for government, the public, the project communities, and international observers
4.8	External Monitoring	Inception Workshop, Mid-term and Terminal External Evaluation, etc

SECTION IV: ADDITIONAL INFORMATION

PART I: Financial Arrangements

The Full-Size Project will be nationally implemented (NIM) by the national Government of Tuvalu through the Department of Environment, where the focal point of contact will be the Director, Department of Environment. The Department of Environment will:

- Be responsible for the financial control of the project through the NIM modality of UNDP;
- Sign-off on all budget and work-plan revisions and maintain project accounts and financial responsibility;
- Work with the project and assume responsibility for entering into necessary work arrangements with other national, state and regional organizations for efficient and effective project implementation;
- Support the project by providing guidance and authority to engage services consistent with the objectives of the project; and
- Receive advances equivalent to the financial needs of the project as indicated in the quarterly work plans provided.

Funds will be released to the Development Account of the Ministry of Finance and Planning. The Ministry of Finance and Planning will be responsible for the initial warrant and disbursement of funds in accordance with the work plan and the project document. Further cash advances will be contingent upon timely reporting of expenditure by the Department of Environment to the UNDP MCO, Fiji.

PART II: Terms of Reference for Key Project Groups, Staff, and Sub-contracts

A. National Climate Change Advisory Board (NCCAB)

The NCCAB will be established by the Ministry of Natural Resources and Environment (MNRE) with the following possible composition. The Board will meet on a six-monthly basis, or if necessary, meetings may be held more frequently.

1) Secretary, Ministry of Natural Resources and Environment– Chairperson
2) Joint Secretary, Ministry of Home Affairs & Rural Development – Member
3) Joint Secretary, Ministry of Health - Member
4) Joint Secretary, Ministry of Education - Member
5) Representative (Joint Secretary level), , Ministry of Finance & Economic Planning – Member
6) UNDP Resident Representative / UN Country Development Manager – Member
7) Two Representatives from Civil Society Organizations – Member
8) National Project Director, Department of Environment– Member Secretary

The NCCAB will be chaired by the Secretary of Ministry of Natural Resources and Environment (MNRE). The members include the UNDP Resident Representative/UN Country Development Manager and senior officials of the respective ministries, and those cooperating organizations/institutions, which have a direct bearing on climate change issues. The Board can co-opt members as deemed necessary and can invite technical experts as required.

Responsibilities

- Ensure that climate change is efficiently and effectively addressed at all sectors, integration of climate change in all policies;
- Establish policies to define the functions, responsibilities, and delegation of powers for the implementing agencies and the Project Management Unit;
- Provide overall guidance on budget management and project activities;
- Facilitate coordination of project activities across institutions;
- Review project activities, and their adherence to the work plan set forth in the project document;
- Take decisions on the issues brought to its notice by cooperating agencies, departments, institutions, and UNDP;
- Provide advice and guidance on efficient and timely execution of the project;
- Initiate remedial action to remove impediments in the progress of project activities that were not envisaged earlier;

B. National Project Manager (NPM)

The Ministry of Natural Resources and Environment (MNRE), Government of the Tuvalu will appoint a National Project Manager (NPM) to be responsible, on behalf of the government, for the project. The NPM will be a senior official, from the MNRE. The NPM will be responsible for the overall administration, management, coordination, implementation, monitoring, and reporting. The NPM will act as the Executive of the Project Board in accordance with RMG/UNDP. The NPM will head the Project Management Unit (PMU), and will be supported by a Project Manager, PMU office staff and local experts.

Responsibilities

- Ensure effective partnership with the Ministry of Home Affairs (MHA), the Ministry of Agriculture, and other implementing partners in the project
- Ensure that project activities are integrated and coordinated with the established operations of the MNRE
- Develop and maintain close linkages with relevant sectoral government agencies, UNDP-GEF, NGOs, civil society, international organizations, and implementing partners of the project
- Supervise and lead the project team in discharging their duties at an optimum level through ensuring efficient and effective resources utilization

With the support of the Project Coordinator, the NPM shall:

- Oversee establishment of the PMU, with systems for the sound management of all project activities, implementation arrangements with partner agencies, and financial disbursements
- Prepare detailed annual breakdowns of the work plan for all project objectives
- Identify resource requirements, responsibilities, task outlines, performance evaluation criteria, and work plans based on the FSP and project progress
- Develop detailed and measurable quarterly performance indicators for each project output at the outset of the project based on the FSP
- Prepare quarterly work plans, which include indications of the extent to which the previous quarter's activities have contributed to the project's overall objectives
- Prepare and finalize detailed Term of Reference and qualifications for each national expert
- Submit, as required, Annual Performance Review (APR) to tripartite (TPR) review meetings
- Direct and supervise the establishment of project administration procedures for all staff, subcontracting organizations/individuals, and participating agencies
- Approve quarterly status and financial reports for comment and approval by the Outcome Board

- Approve six-month budget forecast requests for approval by the Outcome Board
- Oversee implementation of Outcome Board directives

C. Project Coordinator

The Project Coordinator will report to the National Project Manager (NPM), and work under the supervision of the NPM and UNDP management. The Project Coordinator will lead the project team through the planning, implementation, and delivery of policies, reports, knowledge products, and other results approved in the project document and annual work plans. S/he will provide overall operational management for successful execution and implementation of the programme. S/he will be responsible for financial management and disbursements, with accountability to the government and UNDP.

In carrying out her/his responsibilities, s/he will advocate and promote the work of adaptation to climate change in Tuvalu and will also closely work and network with relevant Government Ministries, Kaupules and NGOs.

Responsibilities

- Facilitate the day-to-day functioning of the PMU
- Manage human and financial resources, in consultation with the project's senior management, to achieve results in line with the outputs and activities outlined in the project document
- Lead the preparation and implementation of the annual results-based work plans and logical frameworks as endorsed by the management
- Coordinate project activities with related and parallel activities both within MNRE and with external implementing partner agencies
- Monitor project activities, including financial matters, and prepare monthly and quarterly progress reports, and organize monthly and quarterly progress reviews
- Support the NPM in organizing Outcome Board meetings
- Coordinate the distribution of responsibilities amongst team members and organize the monitoring and tracking system of all cluster services
- Report and provide feedback to UNDP-GEF and the Outcome Board on project strategies, activities, progress, and barriers
- Manage relationships with project stakeholders including donors, NGOs, government agencies, and others as required

Qualifications

- Specialist in natural resources management in a supervisory capacity, specifically on issues related to climate change, biodiversity, and/or coastal and wetland resources management

- Tertiary qualifications with 5 years working experience within the disciplines of environmental science, geography, or natural resource management
- Sound policy understanding of global development concerns, climate change discourse, and adaptation to climate change
- Extensive business and information exchange contacts with national and international agencies involved in local and international studies of climate change, in general, and adaptation, in particular
- Proven track record of project management and project team experience working with government, NGOs, and other key stakeholders in Tuvalu
- Excellent verbal and written skills in English and Tuvaluan

D. Community Organizers

Community Organizers (COs) will report to the Project Manager and receive guidance for day-to-day project activities from the PMU and Kaupule Office. They will be responsible for facilitating community mobilization and coordination of all project activities at the site level and will act as focal points for community mobilization. Community Organizers will be guided by the Kaupules.

Responsibilities

Coordination

- Select a site-specific Coordinator for each site
- Coordinate participating agencies/partners at the site level, working with partners' site-level representatives to implement project activities and complement ongoing activities
- Serve as project representative with all concerned GoT officials at National level, NGOs, and local government bodies
- Organize and conduct monthly meetings, workshops, seminars, and other meetings in collaboration with DoE and Kaupules, and present monthly progress reports to the partners and PMU
- Liaise with local GoT and non-GoT service providers and promote CBOs to establish strong linkages for acquiring services and to undertake advocacy campaigns on policy issues
- Organize programs for visitors as required

Training and Awareness Programmes

- Conduct training courses as per the work plan to strengthen and sustain CBOs
- Prepare periodic awareness programs in consultation with team members and partners
- Assist community workers of project partners in organizing awareness programs and workshops at community levels

Institutional Development

- Help CBOs build capacity to prepare adaptation initiatives and to access and make the best use of project funds
- Support CBOs to improve their capacities to effectively raise issues of concern at the local level, and to act as advocates for community members during decision-making processes and to secure necessary support from the service providers
- Guide and facilitate CBOs with the help of project staff to improve their monitoring systems, including catch monitoring through report cards and follow up, and to ensure use of results from the report cards
- Conduct CBO assessments every six months in collaboration with project partners and share the findings with respective CBOs for future improvement
- Support project staff to monitor CBOs accounts and provide financial management guidance
- Advise and provide trouble shooting for CBOs if and when required
- Guide the project staff in organizing village-level meetings and participate in the meetings with CBOs, villagers (along with concerned staff), and UPs
- Facilitate CBOs to build up strong relationships with other CBOs and the local elected representatives
- Take part in organizing and strengthening CBOs as local adaptation organizations and coordinate with partner in integrating adaptation activities

Monitoring and Reporting

- Prepare concrete and verifiable targets for project activities, including awareness campaigns, resource management, wetland habitat restoration and enhancement, sanctuary management, tree plantation, monitoring surveys, and institution building
- Ensure that CBOs revise their yearly Adaptation Plan, which should be duly approved by the DFO and displayed at the office
- Prepare quarterly and annual work plans for the project activities and integrate the same with other partners for the site
- Prepare and submit monthly and all other types of progress reports and case studies on various surveys, good practices, and field programs

The Community Organizers will also perform any other jobs as requested and required by the NPD, Project Manager, PMU, or other project authority from time to time as and when required.

Qualifications

- Familiarity with the social and environmental context of the community
- Experience working with the government, NGOs, CBOs, and other partners in the area
- Experience mobilizing community members for development projects and activities
- Good verbal and written English and Tuvaluan skills

E. CZM Experts (1 international, 1 local)

The Coastal Zone Management Experts will report to the Project Coordinator. The experts will be engaged in the analysis of CZM frameworks within the Government of Tuvalu (GOT) and will provide advice to the Project Manager about integrating GOT activities into an integrated CZM framework. The experts will also be engaged in the analysis of at least 4 sectoral policies and institutional mandates which promote or impede coastal community resilience, and will provide advice and assistance to the project to further develop climate change adaptation plans for each island.

Responsibilities

- Reviewing legislation, plans, strategies, policies and current practices relating to coastal management in Tuvalu, including a focus on livelihoods and financial impacts at the community level.
- Developing recommendations, strategies and frameworks for implementing integrated CZM in Tuvalu and integration of climate change into sectoral policies
- Liaison with stakeholders including GOT Ministries and Departments, Kaupules, NGOs and community groups and organisations, on development of integrated CZM in Tuvalu
- Work in collaboration with the Climate Change Adaptation Expert to prepare site-specific adaptation plans, which include the following:
    a. Participatory approach for mangrove and non-mangrove coastal afforestation;
    b. Participatory approach for gender-sensitive livelihood diversification;
    c. Participatory approach for assessing early warning needs to safeguard alternative livelihood investments against extreme climate events; and
    d. Definition of specific adaptive measures for coastal livelihoods.
- Apply her/his knowledge on participatory rural appraisal (PRA) techniques and climate-resilient livelihood support
- Work closely with research organizations that will be involved in the development of site specific adaptation plans
- Communicate these plans to each agency that will be responsible for its implementation.
- Develop at least 4 policy notes outlining and demonstrating the impacts, costs, and benefits of a particular sectoral policy on the resilience of livelihoods in coastal areas.

Qualifications

- Degree in environmental policy, coastal zone management or natural resource management or a related field
- Demonstrated experience in a supervisory capacity in developing policy frameworks for integrated resource management
- Demonstrated experience in negotiating and interacting with both internal and external stakeholders on complex natural resource management issues

- Demonstrated ability to research, analyse and present workable solutions to a range of issues affecting coastal and marine environments
- Demonstrated ability to communicate in English effectively both verbally and in writing
- High level facilitation, communication and presentation skills
- Pacific Island experience

F. Climate Change Adaptation Expert

The Climate Change Adaptation Expert for climate resilient development will report to the Project Coordinator. A detailed TOR for the Climate Change Adaptation Expert will be prepared by the Project Coordinator during the project implementation.

Responsibilities

- Develop site-specific adaptation advice and plans in consultation with concerned implementing partners. These plans will focus on the following:
    a. Participatory approach for mangrove and non-mangrove coastal afforestation;
    b. Participatory approach for gender-sensitive livelihood diversification; and
    c. Participatory approach for assessing early warning needs to safeguard alternative livelihood investments against extreme climate events.
- Apply her/his knowledge on community-based adaptation to climate change and work closely with research organizations involved in the development of site-specific adaptation plans
- Communicate these plans to each agency that will be responsible for its implementation.

Qualifications

- Postgraduate degree in environmental sciences, social science, geography and/or relevant disciplines including engineering
- Extensive experience in vulnerability and adaptation needs assessments at the community level and regarding the formulation and implementation of community-based climate change adaptation measures
- Previous demonstrated experience working in a project team
- Familiarity with, and up-to-date knowledge on, various international efforts in vulnerability and adaptation to climate change and climate variability
- Excellent verbal and written English skills

G. Capacity Building Expert

The Capacity Building Policy Expert will report to the Project Coordinator.

An expert to;

- develop capacity building and training materials in climate-resilient development planning, and develop a team to conduct the capacity building activities
- facilitate training and community awareness by the capacity building team at the island level
- assist in the establishment of the NCCAB and conduct required capacity building to make the body effective

Responsibilities

- Facilitate and manage regular training and capacity building related activities
- Undertake a training needs analysis and assessment of capacity building requirements of government departments, island kaupules, and NGOs involved in climate change management and adaptation in Tuvalu
- Prepare detailed plans of action and budget estimates for workshops, seminars and other related activities
- Prepare training/capacity building plan,
- Be responsible for planning, managing and implementing training/capacity building plans and initiatives of the project
- Support experts in the project in the development of methodological materials and training packages
- Be responsible for the process of knowledge sharing in the project
- Prepare reports as required

Qualifications

- University degree in social sciences, public administration or related field
- At least 5 years experience in institutional development, training and capacity building in a supervisory capacity
- Experience in all aspects of training activities
- Pacific Island experience
- Ability to conduct training and capacity building at both central and local government levels
- Able to work effectively as part of a team
- Excellent verbal and written English skills

- High level facilitation, communication and presentation skills

H. Local Environment Committees/Kaupules

The term "Local Environment Committees" refers to Committees established under the Falakaupule and/or Environment Acts. The Kaupule of each district will coordinate these committees to ensure effective implementation of project activities at the local level. Specific tasks of these Committees include:

- Facilitation of effective coordination of the project at the district level
- Local conflict resolution related to land use issues
- Local resources will be mobilized to facilitate project implementation.
- Local Environment Committees may assign CBOs if necessary to implement livelihood promotion related to activities at community and household level.

I. Office Administrative Assistant

The Office Administrative Assistant will report to the Project Manager and receive guidance from the NPD and the Project Manager.

Responsibilities

- Maintain all files and records of the project in both electronic and hard copies
- Provide logistical support to the National Project Director, Project Manager, and international consultants in organizing training events, workshops, and seminars
- Maintain close linkages with relevant agencies and stakeholders
- Assist international, short-term consultants by organizing their travel schedules, arranging meetings with different stakeholders, and book hotel accommodations
- Prepare monthly leave records for the project staff and international consultants
- Prepare and update inventories of expendable and non-expendable project equipment
- Assist the project team in designing project reports in compliance with GoT and UNDP formats
- Draft necessary correspondence with local agencies and stakeholders

Qualifications

- 3 to 5 years of relevant administrative or program experience at the national or international level
- Bachelors degree and/or certificate in secretarial or computer training an advantage
- Experience in using computers and office software packages, particularly word processing and spreadsheets (MS Word, Excel, etc.)

- Knowledge of database packages and web-based management systems

J. Office Attendant

The Office Attendant will report to the Project Manager and receive guidance from the NPD and the Project Manager.

Responsibilities

- Prepare and update list of all project files
- Maintaining all files in chronological manner
- Ensure all incoming and outgoing official letters and documents are filed appropriately
- Ensure timely delivery of official letters and documents to the recipient
- Provide logistical support to the National Project Director, Project Manager, and international consultants in organizing training events, workshops, and seminars
- Perform other functions that may be assigned by the NPD, Project Manager, or other PMU staff

Qualifications

- H.S.C from any group
- 3 to 5 years of relevant experience at the national or international level
- Familiarity with general office equipment such as telephone PABX, photocopiers, computers, etc.

K. Works Supervisor

The Works Supervisor will be responsible for managing the supply and installation of water storage facilities e.g tanks, and for supply and distribution of materials to be used for coastal protection works.

Responsibilities

Responsible for planning of project related works, allocating and coordinating resources across project sites teams, including Contractors when necessary, and monitoring project team performance. The position is also expected to contribute significantly to the estimating/bidding process. The Works Supervisor must encourage and develop the project team's capabilities and review team achievements in order to meet project objectives and contractual requirements. The Works Supervisor will be located within the Public Works Department and will report directly to the Project Manager.

Qualifications

- Broad experience in coastal works and facilities (e.g water tanks) installation and maintenance in a supervisory capacity.

- Proven ability to effectively plan and co-ordinate the delivery of work and achieve time, cost and quality targets.
- Proven ability to read and interpret plans and specifications for projects and subcontracts, estimate the cost, duration and resources required for project activities and subsequently control costs and forecast expenditure on a daily basis.
- Demonstrated effective communication skills in advising staff and contractors, liaising with clients, the community, and other government agencies.
- Knowledge of and ability to develop, implement and operate with environmental and safety hazard controls and procedures.
- Experience in effectively communicating complex information through facilitation of group discussions and presentations, interviews and written reports while ensuring that contributions from others are invited and valued.
- Experience in facilitating the development of teamwork plans through a participatory approach, which ensures that the plans include measurable objectives, evaluation processes and appropriate risk management strategies.
- Experience in identifying and allocating resources to meet work objectives and to monitor output to ensure resources are appropriate and usage is optimised

L. Local Climate Change Adaptation Expert

The local Climate Change Adaptation Expert for climate resilient development will report to the Project Manager. A detailed TOR for the Climate Change Adaptation Expert will be prepared by the Project Manager during the project implementation.

Responsibilities

- Develop site-specific adaptation advice and plans in consultation with concerned implementing partners. These plans will focus on the following:

  a. Participatory approach for mangrove and non-mangrove coastal afforestation;

  b. Participatory approach for gender-sensitive livelihood diversification; and

  c. Participatory approach for assessing early warning needs to safeguard alternative livelihood investments against extreme climate events.
- Apply her/his knowledge on community-based adaptation to climate change and work closely with research organizations involved in the development of site-specific adaptation plans
- Communicate these plans to each agency that will be responsible for its implementation.

Qualifications

- Postgraduate degree in environmental sciences, social science, geography and/or relevant disciplines including engineering

- Extensive experience in a supervisory capacity in vulnerability and adaptation needs assessments at the community level and regarding the formulation and implementation of community-based climate change adaptation measures
- Previous demonstrated experience working in a project team
- Proven experience of gender issues in the South Pacific and knowledge of methodologies for promoting gender equality and equity
- Familiarity with, and up-to-date knowledge on, various international efforts in vulnerability and adaptation to climate change and climate variability
- Excellent verbal and written English skills

M. Monitoring and Evaluation Expert

The Monitoring and Evaluation (M&E) Expert will report directly to the Project Manager while the Project Manager will oversee monitoring and evaluation activities, the M&E Expert will provide the on-the-ground support needed to closely evaluate progress and barriers and to prepare detailed quarterly, annual, and other monitoring reports.

Responsibilities

- Establish the overall M&E strategy in accordance with the M&E plan outlined in the project document and promote a results-based approach
- Provide timely and relevant information to the Project Manager, PMU, and other project stakeholders
- Coordinate and maintain close communication with the Project Manager, NCCB representatives of primary stakeholder groups, external consultants, and field staff, as well as with members of any other M&E-related projects.
- Guide and coordinate the review of the project logframe, including:
    a. Provide technical advice for the revision of performance indicators
    b. Ensure realistic intermediate and end-of-project targets are defined
    c. Conduct a baseline study (situation at project start)
    d. Identify sources of data, collection methods, who collects data, how often, cost of collection and who analyzes it
    e. Ensure all critical risks are identified
- Coordinate the preparation of all project reports. Guide staff and executing partners in preparing their progress reports in accordance with approved reporting formats and ensure their timely submission. This includes quarterly progress reports, annual project report, inception report, and ad-hoc technical reports. Reports should identify problems and causes of potential bottlenecks in project implementation, and provide specific recommendations.
- Foster participatory planning and monitoring by training and involving primary stakeholder groups in the M&E of activities

- Monitor the follow up of evaluation recommendations
- Organise (and provide) refresher training in M&E for project and implementing partner staff, local organisations, and primary stakeholders to develop local M&E capacity.

Qualifications

- Post-graduate degree in a field related to development and/or management and experience in Monitoring and Evaluation
- Statistical skills essential with knowledge of environmental and development applications
- At least several years of proven experience with:
    a. The logical framework and other strategic planning approaches
    b. M&E methods and approaches (including quantitative, qualitative and participatory)
    c. Planning, design, and implementation of M&E systems
    d. Training in M&E development and implementation and/or facilitating learning-oriented analysis sessions of M&E data with multiple stakeholders
    e. Data and information analysis
    f. Report writing
- A solid understanding of adaptation to climate change and environmental management, with a focus on participatory processes, joint management, and gender issues
- Familiarity with, and a supportive attitude towards, processes to strengthen local organisations and build local capacities for self-management
- Willingness to undertake regular field visits and interact with different stakeholders, especially primary stakeholders
- Leadership qualities, personnel and team management (including mediation and conflict resolution)
- Understanding of UNDP and GEF procedures
- Experience in data processing and with computers
- Excellent verbal and written English skills
- Pacific Island experience

N. Knowledge Management Expert

The Knowledge Management Expert will report to the Project Manager. The expert will design and implement a system to identify, analyze, document and disseminate lessons learned.

Responsibilities

- Consolidate a culture of lessons learning involving all project staff and allocate specific responsibilities
- Ensure that ToR for consultants recruited by the project also incorporate mechanisms to capture and share lessons learned through their inputs to the project, and to ensure that the

results are reflected in the M&E reporting system and the Adaptation Learning Mechanism (ALM)

- Document, package, and disseminate lessons at least once every 12 months
- Facilitate exchange of experiences by supporting and coordinating participation in any existing network of UNDP-GEF projects sharing common characteristics These networks would largely function on the basis of an electronic platform but could also entail other methods and tools such as workshops, teleconferences, etc
- Identify and participate in additional networks, for example scientific or policy-based networks that may also yield lessons that can benefit project implementation
- Capture lessons learned from the project on a continual basis and synthesize results of activities under Outcomes 1, 2, and 3. New learning from the project will include new approaches and methodologies for mangrove and non-mangrove afforestation, facilitating alternative climate-resilient livelihoods, removing policy barriers to building adaptive capacity, and effectively building human and institutional capacity for community-based adaptation
- Collate technical reports and other documents from the project and contribute to the ALM. Guidelines for extracting lessons learned will be drawn from the ALM.

Qualifications

- Degree in environmental management or related field
- At least 5 years experience in climate change, biodiversity, coastal management, or other related discipline
- Experience in knowledge management and evaluations
- Experience in strategies for assisting developing countries
- High level analytical and conceptual skills and the ability to think creatively
- Excellent verbal and written English skills
- Pacific Island experience

O. Management Information Systems Expert

The Management Information Systems (MIS) Expert will report to the Project Manager and receive guidance from the NPD and the Project Manager. The expert will assist with database development and management and maintenance of the government website on the project

Responsibilities

- Establish data and information exchange networks and the MIS with implementing partners
- Design the data collection instrument and ensure the required information flow by linking the field staff and the PMU
- Generate reports based on the information regarding the target communities and beneficiaries for each project site and information regarding adaptation

- Analyze, collate, and verify reliability of the information regarding the delivery and performance of project outputs from possible sources and computerize the information in relevant software
- Provide guidance to the project team on key outputs (including approaches for collecting and using relevant information), making a clear distinction between baseline and additional strategies, policies, and measures necessary to address climate change risks
- Prepare monthly project information bulletins in consultation with the Project Manager.
- Provide technical input to the Knowledge Management Expert in preparing lessons learned and good practices or success stories of the project.
- Participate in the studies to be carried out by other consultants and sub-contracted teams;
- Any other activities as designated by the Project Manager.

Qualifications

- Masters degree in Information Technology, statistics, or development studies
- At least 10 years experience in Information Management Systems, database development and management, and information-related activities.
- Computer Proficiency, including database administration is required in different relevant software (particularly Microsoft Access and Excel)
- Knowledge of reporting methodologies
- High level analytical and conceptual skills and the ability to think creatively
- Excellent verbal and written English skills
- Pacific Island experience

P. Agricultural Expert

The Agricultural Expert will report to the Project Manager. An expert to identify technical constraints and opportunities of introducing salt-tolerant species in island agriculture.

Responsibilities

- Characterize agricultural production systems in the proposed project sites.
- Conduct a comprehensive analysis of natural resource in the proposed project sites, including associated biodiversity resources.
- Assess the impacts of the various agricultural production systems and associated farming practices on the agricultural biodiversity of the proposed project sites.
- Identify those agricultural production systems and associated farming practices that have (a) the least negative impacts on agricultural production, and (b) the highest potential for continuation.
- Identify those agricultural production systems and associated farming practices where production practices can be modified to improve production levels through introduction

and/or replacement of salt-tolerant crop species, including identifying threats and weaknesses if other crop species are introduced.

- Assess the implications of loss of agricultural biodiversity and production for local communities.
- Assess the potential for in-situ conservation of agricultural biodiversity, identifying a range of specific agricultural production systems and practices which are supportive of in-situ conservation.

In conducting the consultancy, the expert is expected to:

- Coordinate closely with the Project Manager in the development of all activities.
- Review relevant literature, including documents, reports, reviews, etc.
- Meet with relevant stakeholders, which will include Government, private sector, international non-governmental organizations, local communities, and others.
- Support the organization and realization of workshops with all relevant stakeholders, to build partnerships and collaboration and raise awareness, as needed.
- Organize and realize field visits, as needed.

Qualifications

- Masters degree in agriculture, forestry, environmental science or another related discipline.
- More than five years working experience in forestry, agriculture, environment or other related area.
- Proven experience conducting field assessments.
- Experience working with international organizations on project implementation
- Knowledge of agricultural biodiversity in a small island context.
- Builds strong relationships with stakeholders, focuses on impact and result for the stakeholders and responds positively to feedback; consensus-oriented.
- Highly developed inter-personal, negotiation and teamwork skills, ability to work in multi-cultural environment.
- Pacific Islands experience
- Excellent English writing and communication skills.

PART IV: Stakeholder Involvement Plan

An overview of stakeholders' roles in coastal zone management, livelihoods, and climate change is provided in the table below.

Table 8: Stakeholder Involvement Plan

Name/ Type of Institution	Contacts	Mandate/Objectives	Role in PPG	Specific Output Responsibilities
Ministry of Home Affairs	Lopati Samisoni, Director	Facilitate delivery of programs of other Departments to all communities Operates under Falakapaule Act 1979	Approval required for all projects in Tuvalu Involvement in awareness-raising among youth, through the office of the National Youth Officer	No formal executive function in the project
Ministry of Natural Resources and Environment	Minister, Hon Tavau Teii Permanent Secretary Mataio Tekinene Kilifi O'Brien	Environmental protection and land management throughout Tuvalu	Lead agency	Central coordinating function for the project; will provide facilities for the PMU and is chief point of contact for the project externally
Ministry of Finance, Budget and Planning Division	Amosi Taui, Director, Budget and Planning Division	Review and approve all public sector budgets, conduct fiscal planning and control	Ensure inclusion of government in-kind contributions in national budget	Outputs 1.1, 1.2
Ministry of Agriculture	Minister Permanent Secretary Sam Panapa, Acting Director	Support commercial and subsistence agricultural livelihoods	CBA projects: tree-planting projects and efforts to reduce soil salinity; introduction of salt-tolerant species Incorporate agricultural baselines	Outputs 1.1, 2.1 - 2.3
Ministry of Fisheries	Minister Permanent Secretary Samasoni Auina, Director	Support to livelihoods from inshore fisheries	Coastal tree-planting projects will have synergistic benefit of supporting fish nursery areas Incorporate capacity needs for effective fisheries management	Output 2.2
Public Works Department	Minister Permanent Secretary	Construction, delivery, and maintenance of public	Works supervision, coastal protection works and water tanks	Outputs 1.1, 2.1 - 2.3

Name/ Type of Institution	Contacts	Mandate/Objectives	Role in PPG	Specific Output Responsibilities
	Ampelosa Tehulu, Director	facilities throughout Tuvalu; implementing agency of public works projects including coastal protection works and water tank delivery and installation		
Lands and Survey Office	Faatasi Malologa, Director	Land mapping, GIS services, satellite imagery and coastal zone morphology monitoring	Mapping and aerial survey as required	Outputs 1.1, 2.1 - 2.3
Ministry of Education	Minister Permanent Secretary Michael Noa, Director	Construction and operation of educational facilities throughout Tuvalu; delivery of education services; public awareness and community training	Potential role in public awareness and community training and in assisting the building of civil society networks in the islands	Outputs 1.1 – 1.4
National Disaster Coordination Office	Sumeo Silu, Coordinator	Community preparedness and rapid response to anticipate and deal with natural disasters	Potential role in public awareness and community training for climate risk awareness and adaptation	Outputs 1.1 – 1.4
Ministry of Health	Minister Permanent Secretary Dr Stephen Homasi, Director	Protection of public health throughout Tuvalu, including water supply quality monitoring and sanitation	Potential role in public awareness and community training and in assisting the building of civil society networks in the islands Incorporate recommendations of studies of health impacts of climate change	Outputs 1.1 – 1.4
United Nations Development Programme (UNDP) Fiji Multi-Country Office and Pacific Centre		UNDP's Energy and Climate Change portfolio of projects addresses climate change, primarily through building coping mechanisms at all levels for adaptation and linking climate change mitigation to develop sustainable energy for the poor and to promote energy	PPG—Coordinate with MNRE to engaged experts to draft project document. Facilitate stakeholder consultations. Assist government in recruitment of experts and NGOs to achieve outputs. Perform vital external monitoring and evaluation. Liaise with other international and bilateral organizations.	All outputs

Name/ Type of Institution	Contacts	Mandate/Objectives	Role in PPG	Specific Output Responsibilities
		efficiency. It has support the development of Tuvalu's national communications, NAPA, and various adaptation capacity building activities.	Provide technical support for project implementation, monitoring, learning, and knowledge sharing. Progress reporting to GEF. Participation in the NCCAB and coordination of activities with the Project Management Unit (PMU). Technical and financial monitoring of the use of project funds.	
Kaupule's/ Local Environment Committees	Kaupule on each of the 9 islands	Provide local government and public information capacity	Conduit for public information, main point of contact for personnel and resources flowing to the islands for CBA. Assist development of civil society networks in the islands and coordination of community organising and training	Outputs 1.2, 1.4, 2.1 – 2.3, 3.1, 3.2
Local Communities/ CBOs e.g TANGO, Red Cross, National Council of Women	Will be engaged depending on needs	Community mobilization, facilitate project implementation	Participate in planning and implementation of project interventions at the community level by invitation of the PMU and other components through consultation with island kaupule	Output 1.1, 1.3, 1.4, 2.1 – 2.3

Annexes

Annex 1:	Government of Tuvalu Letter of Endorsement and Co-Financing Letters (to be provided later)
Annex 2:	Baseline Analysis
Annex 3:	Project Risks and Assumptions
Annex 4:	Policy, Legislation, and Government Institutional Relationships
Annex 5:	Project Profiles, by Island
Annex 6:	Professional Inputs to the Project

Annex 2: Baseline Analysis

168. In 2005, Tuvalu finalized its national strategy for sustainable development 2005-2015 known as "Te Kakeega II". It reflects the views of all stakeholders expressed during a National Summit held in 2004. The vision for the Kakeega II recognizes the importance of sustainable development, i.e. not letting current utilization of natural resources, consumption patterns, etc compromise the ability of future generations of Tuvalu to meet their needs. Each of the sectoral strategic development priorities of the Kakeega II will contribute to the achievement of its vision "to achieve a healthier, more educated, peaceful and prosperous Tuvalu".

169. The proposed NAPA activities are a way forward to improve the way climate change is incorporated in national decision making processes. They will ensure compatibility between adaptation measures and the Kakeega II development priorities and other plans, and will also be mainstreamed into other on-going programs to enhance synergy and cost effectiveness of programs at the sectoral level.

170. The NAPA has developed adaptation measures as activities to address the immediate and urgent needs of stakeholders, complementary to the national vision of the Kakeega II as well as other multilateral environmental agreements. The NAPA and the Initial National Communication (INC) established that the low adaptive capacity of communities to withstand adverse climate change impacts is due to Tuvalu's weak economy and remoteness. Vulnerability is complicated by the high dependence of a majority of the population on climate-sensitive sectors, such as agriculture and fisheries as well as weak infrastructure facilities, institutional mechanisms and lack of financial resources. In order that coastal communities effectively adaptto climate change, effective policies, capacity development, and specific interventions are required to directly address the risks posed by climate change, including variability.

171. As evidenced in the NAPA and INC processes, numerous factors beyond the boundaries of climate change and variability affect the resiliency of the coastal sector. These factors include increasing population pressures on fragile coastal resources, beach sand mining for construction purposes (which compound climate change induced coastal erosion), and inappropriate construction or maintenance of seawalls which were designed to be protective but which often worsen erosional effects. The Government of Tuvalu is addressing these other pressures on the coastal sector through enforcement of applicable environmental guidelines. Some of these "baseline" activities (i.e. activities that would be implemented in the absence of climate change) include creating green belts to protect and rebuild eroded areas and (as necessary) providing alternative settlement locations for coastal communities.

172. The National Council of Women implemented a NZAID-funded tree planting project and the NGO's plant-a-tree project on Niutao with local species like *Calophyllum inophyllum* and *Pandanus* species. The Ministry of Natural Resources and Environment is also conducting a community-based tree planting program with support from the UNCCD. Both projects exemplify community-based coastal vegetation development suitable as a model for the proposed project.

173. In 1984, a beach profile and bathymetric survey was carried out by SOPAC to assist in the identification of problem areas along the shoreline and provide estimates of seasonal sediment transport. In addition, other studies were also carried out on Vaitupu and Nukulaelae (1993), Fongafale (1995), Amatuku (1996) and Nukufetau (1996) to address coastal erosion, sand transport and sedimentation problems in order to advance coastal management on the islands.

174. Current baseline activities in coastal areas are limited geographically and do not incorporate additional impacts of long-term climate change. Although various baseline projects are ongoing or planned to support coastal development, mangrove re-vegetation, and livelihoods interventions, there is need to support the Government of Tuvalu to overcome constraints in effectively reducing the threat of cyclones, storm surges, and sea level rise. Climate-induced impacts are already causing displacement of human settlements, land losses and associated social tensions over remaining land and other scarce resources. The ill-effect of social instability caused by climate change and variability could adversely affect sustainable livelihood opportunities and development in coastal regions.

175. Key vulnerabilities of particular relevance to the project are summarised in the following paragraphs.

Water Resources

176. Low monthly dry season rainfall frequently results in water shortages from June to September each year. However, droughts that are associated with an El Niño event are prolonged and pose a significant threat to lives and livelihoods. During the 1999 El Niño event, a state of emergency was declared for Nanumaga and Niutao (two of the northern islands) and in November the declaration was extended to the capital island Funafuti. In response, the Government imported desalination plants as a means to urgently meet public water demand. Loss of assured sources of water supplies is consistently ranked by communities as one of the major climate change related risks to the quality of life in Tuvalu.

177. Increasing frequency and longer durations of drought periods due to El Nino increases the salinity of groundwater, adversely affecting subsistence agriculture and increases skin diseases and eye infections. In the past, groundwater has been used as a source of fresh water, but has now become contaminated by waste and is increasingly saline. Groundwater is currently the main source of water for agriculture, including staple crops. Saltwater intrusion is destroying traditionally important pulaka pit gardens; since the pulaka (*Cytosperma chamissonis*) grows best close to the water table, saltwater intrusion threatens the total loss of pulaka cultivation unless a salt tolerant species can be introduced, and/or fresh water can be stored in sufficient quantities for irrigation during the dry season.

Subsistence Agriculture and Food Security

178. Saltwater intrusion is also affecting coconut, breadfruit, and pandanus productivity. Despite increasing food importation, domestically grown food remains to be the main source of nutrition for the people. Domestic subsistence agricultural production has been declining in recent years (Kakeega II 2006; 37), and has resulted in increasing import dependence, increasing internal urban drift and changing lifestyles, leading to increases in lifestyle diseases.

179. In addition. it has been noted that rising temperatures correlate with increasing incidences of fruit fly destruction of fruits, and with the coconut scale pest (Aspidiotuf destructor) in Nanumaga and Vaitupu. Increasing incidence of extreme events will place further stress on a weakening agricultural capacity of the country. It is expected that climate change impacts could result in crop yield losses of 60% of pulaka, 50% of bananas, and 50% of breadfruit; with uncertain but expected-to-be measurable impacts on livestock (pigs and poultry) which provide the bulk of protein in the Tuvaluan diet.

Coastal Erosion

180. Erosion and accretion are common features on all the islands of Tuvalu, especially during tropical cyclones and associated high seas and surges. Sea level rise will accelerate coastal erosion and accretion processes, and this may (and in the past, has) lead to loss from one family's and accretion on another family's land. Such change in coastal morphology produces increasing family land boundary disputes.

181. Human activities through aggregate excavation and de-vegetation of shorelines exacerbate coastal erosion. Coastal flooding and inundation are also common features on low-lying coastal areas such as Tafega, Nanumea (NAPA 2005). Repeated flooding of this nature, particularly during springtides, has resulted in degradation of the terrestrial land and permanent damage to coconut plantations and terrestrial ecosystems. Furthermore, inundation results in water logging of soak pits and exposure of the population to sewage from septic systems, increasing the potential for diseases and other water borne health problems. It is observed that coastal and land surface erosion contributes to the shallowing of central lagoons from sediment deposition, and suffocates coral reefs.

182. The rate of sea level rise is expected to be higher than the rate of coral growth. Coral reefs are also highly sensitive to increases in sea-surface temperature and atmospheric carbon dioxide concentrations, both global effects associated with climate change. Destruction of the coral reefs, expected from rising sea surface temperatures, will be a major blow to the first line of islands' natural defence and fisheries ecology.

183. The islands of Tuvalu are geologically young, having poorly developed, infertile, sandy and coralline soils. The atolls are dynamic and are subject to continued erosion and deposition, some of this occurring over long periods, and some occurring rapidly as a result of major storms. Increased extreme storm events, rising sea levels, and more

intensive land use along the coastal zone combine to increase Tuvalu's vulnerability to coastal erosion.

184. Previously constructed 'hard' sea walls have not been adequately maintained and may also contribute to coastal erosion in areas not protected by sea walls. Sea walls cut off the landward supply of sand during storm events, resulting in waves attacking unprotected areas to a greater extent than they would have done prior to the sea wall construction. Soft structures, which absorb wave energy and tree planting are more suitable for erosion control.

185. A long term adaptation strategy based on island-specific adaptation plans would address recurrent emergency relief assistance needed by coastal population, which will increase with more frequent and severe extreme climate events (including cyclones, tidal surge and storms, and floods), and would also address emerging climate change problems coherently. These signal a clear need to develop updated and complementary strategies, understand current and projected levels of climatic risk, consolidate vulnerability assessments in coastal areas and ensure political commitment and economic feasibility of climate change adaptation measures.

Annex 3: Project Risks and Assumptions

186. The number of households with climate-resilient livelihoods is the key indicator of reaching the project's objective in all islands of Tuvalu. The monitoring indicators of the proposed project are consistent with UNDP's *Monitoring and Evaluation Framework for Adaptation to Climate Change*. Indicators for the proposed project have been defined in the Strategic Results Framework (see Section II, Part I).

187. The project assumes that the concerned government ministries will continue to support climate-resilient development interventions; that key Environment and CZM legislation will be implemented as planned; that staff turnover will not negate training and learning benefits; and that coastal land in project areas will not be lost to extreme events or sea level rise. A selection of risks and assumptions include the following:

- Coordination between agencies and various stakeholders (MNRE, PWD, MOH, Education, DoA, Fisheries, relevant NGOs, and international organisations) is sustained after the project, subject to
    - Staff who are unfamiliar with climate change do not attend training and/or staff turnover undermines training benefits (*risk*)
    - Government officials attend coordination meetings and actively support continuous and effective information sharing (*assumption*)
- Stakeholder support is sustained after the project, subject to
    - Communities, government officials, and NGOs continue to support CBA and continue to participate in project activities at the national and island levels (*assumption*)
    - Champions exist in each island kaupule and affected community who are willing to establish and maintain the civil society networks (*assumption*)

188. For more information, see the Strategic Results Framework in Section II.

Annex 4: Current Policy, Legislation, and Government Institutional Relationships

Policy and Legislation

189. The proposed project is directly aligned with Tuvalu's development priorities. The Tuvalu NAPA on which the project is based was developed to support the Kakeega II, the National Strategy for Sustainable Development 2005-2015, in harmony with other action plans and other development aspirations of the government of Tuvalu. This policy is committed to the realization of the MDGs, in particular to (i) improving the quality of life for every Tuvaluan; (ii) providing the enabling environment for employment and private sector development; and (iii) strengthening human capacity and ensuring sustainable development and conservation of Tuvalu's natural resources and protection of the environment.

190. The goal of the Tuvalu NAPA is to provide a framework that will guide the coordination and implementation of adaptation activities in the country. The proposed project is consistent with Tuvalu's Initial National Communication (INC) to the UNFCCC, the GEF Pacific Alliance for Sustainability Program Framework (G-PAS), where this NAPA project has been listed as a top priority, as well as the Pacific Regional Climate Change Framework for Action on Climate Change 2006-2015. Complementaries with the SCCF-funded Pacific Adaptation to Climate Change Project (PACC[8]) and the GEF-funded sustainable Integrated Water Resource Management (IWRM) regional projects will be secured through the existing National Climate Change Study Team that will oversee both this project as well as the PACC and ensure that activities are complementary and that project lessons on functional community-based adaptation options are exchanged on a regional scale.

191. The project is aligned with the existing institutional setup to address climate change issues in Tuvalu. Much of Tuvalu's environmental legislation is relevant to coastal zone management, and there are a number of Acts and Ordinances that clearly contribute to Tuvalu's framework for coastal zone management as part of Tuvalu's climate change adaptation framework. This includes *et al*, the **Conservation Areas Act 1999**, the **Falakaupule Act 1997**, the **Marine Pollution Act 1991** and the **Marine Resources Act 2006**.

192. The **Environment Protection Act 2007** is designed to integrate the relevant legislation, policies and activities applicable to coastal zone management and climate change

[8] The PACC, through its pursuit of enhancing the long-term resilience of key economic sectors, is a wholistic framework for a regionally-coordinated and nationally-executed strategic program on addressing climate change adaptation in three focus areas: food security, coastal management, and water resource management. The PACC is a US$13.1 million 5-year regional project aimed at promoting adaptation in 13 Pacific island countries, including Tuvalu. PACC's Inception Workshop was held in Samoa in early July 2009 to finalize the first annual work programme and to help countries to prepare for implementation at the national level. The IWRM is a regional project administered by SOPAC to promote water resource supply security and quality monitoring and control.

adaptation. The objectives of the Act give the MNRE the responsibility "to coordinate the role of government in relation to environmental protection and sustainable development". The establishment of a National Environment Council under the Act provides a logical focal point for coordination and integration of Tuvalu's efforts to achieve an integrated approach to coastal zone management and consequently a coordinated and integrated approach to community-based adaptation which takes into account all sectoral interests. The Council's proposed mandate of providing advice to the Minister on "matters relating to environmental protection and sustainable development within and, where relevant, outside of Tuvalu" provides a means to coordinate sectoral interests and activities. Additionally, the establishment of Island Environment Committees under the proposed Act by the Kaupule will provide a coordinating, reporting and implementing mechanism for on–the-ground activities under the Act.

Institutional Relationships within the Tuvalu National Government that are Relevant to Climate Change and Coastal Zone Management

193. The following table summarises the roles of various key Government Departments which have relevance to coastal zone management (CZM) and climate change, and which would have a role in project implementation.

Agencies Currently Relevant to Climate Change and Coastal Zone Management

Department	Responsibility
Home Affairs	• Facilitate delivery of programmes of other Departments to all communities. • Entry point of community-based programmes. • Operate under Falakapaule Act 1979.
Lands and Survey	• A data and information agency. • Conduct site surveys as required. • Collect satellite and photo imagery and able to provide recent satellite imagery of islands. • Original satellite imagery funded by NAPA.
Agriculture	• Decentralized with Agriculture extension officers placed on each island. Headquarters on Vaitupu. • Participation in mangrove plantings on 3 islands by women's groups. • Involved in trialling of new yam crops from Federated States of Micronesia • Agriculture Bill to be passed soon.
Environment	• Overall coordination of environmental issues. • Operate under Environment Protection Act 2007
Fisheries	• Undertake data collection on inshore fisheries. • Establish community based management for inshore fisheries on 2 islands, with 3 more in the pipeline. • Foresee development of inshore management plans for all islands upon funding availability. • Record anecdotal evidence of declining catch size and quantity of stock including clams and lobsters. Foresee re-location and rehabilitation of clam hatchery due to operational issues • Operates under Fisheries Act with main focus on offshore fishery
Education	• Recognize the need to officially mainstream environmental issues into school curriculum since students have a fair knowledge of climate change • Developing strategic plan 2006-10 with a focus on community partnerships and revival of community training centres (CTCs). CTCs will include aspects of environmental

	stewardship. • CTCs to be community driven, offering vocational training with possible funding from AusAid
National Disaster Coordination Office	• Oversee disaster coordination • Prepare plans, standard operating procedures • Include coastal protection • Conduct disaster risk management assessments, including climate change through awareness program on climate change • Disaster plan covered by Act • Conduct community workshop and advise on relevant issues, including climate change
Budget	• Incorporate sectors in development budget • Public Sector Investment Program specifying government infrastructure projects affecting coastal areas will also be relevant to climate-resilient coastal zone management
Health	• Offer outpatient care on islands • Undertake water testing outside Funafuti • Aware of linkages between health and climate change Establish vector control programs in islands • Record of cholera in early 90's, • Typhoid on Vaitupu recently – occasional outbreaks, o malaria – outbreak of dengue but contained
Public Works	• Provide engineering responses to climate change but currently lack capacity to undertake new projects e.g seawall construction. Hoping to have new staff end of 2009 • Manufacture water tanks in Funafuti (10,000L). Face difficulty in distributing tanks to islands,
Meteorology	• Provide morning and evening weather forecasts, and 3-monthly forecasts • Have tide gauge to measure tidal movement, sea temp, winds • Limited capacity for climate change prediction

Annex 5: Project Profiles by Island

The following project profiles are based on consultations with island Kaupule representatives during the initial consultations. Due to the remoteness of the atolls, the PPG expert team could not visit each of the islands for detailed assessments. For this reason the actions and corresponding budgets described are indicative, limited in scope, representing some of the most pressing needs in the communities. The project allocates resources to undertake more detailed and site-specific assessments and consultations in order to plan and implement comprehensive adaptation measures through building capacity of local communities in each of the atolls.

a) Funafuti

Title	Coastal erosion protection and stabilisation
Location	Funafuti
Summary	Coastal erosion on Funafuti and surrounding islands is a significant issue. There have been a range of engineering responses developed and implemented in the past involving primarily the construction of seawalls on Funafuti, most of which appear to have failed. A JICA-funded study is currently underway which will result in long-term options for coastal protection being developed. Additionally, $200,000 is identified in the current Tuvalu Government budget for coastal protection. This pilot project will focus on the islet of Tepuka, in which a soft engineering approach will be implemented to stabilize the islet's coastline. The lessons learnt from this may be applied elsewhere depending on specific site circumstances.
Timing and Duration	To be developed
Budget	$423,000 USD – see budget details below
Outcomes/Outputs	The outcome will be site protection and stabilization of the islet of Tepuka which is currently being significantly impacted and eroded by coastal processes.
Adaptive Capacity Development	Selected Kaupule and Government staff (MNRE, PWD) will be trained in the relevant technique and materials used so that they are able to train others in replicating the approach.
Feasibility	The technology proposed, use of geotextile bags, is a proven technique used elsewhere in the world e.g Fiji, Bahrain, locations around Australia. It is therefore a highly feasible response to the issue.
Risks	• Personnel trained in this technique fail to implement it within the technical parameters specified leading to failure of the protection measures • The protection could be dismantled by members of the community seeking materials to construct buildings or structures • The technique may not be supported by those required to implement it e.g they may prefer a long term 'hard' engineering solution.
Need for Project	There is a high need for the project because of the continuing issue of coastal erosion around the islet. The islet has also been identified for possible future tourism development.
Partnerships	• The Tuvalu Government has identified funding in 2009 for coastal protection on Tuvalu • Tango (umbrella NGO) would be able to provide some expertise

	and human resources to enable skills to be transferred elsewhere through training and capacity building • PWD would be able to provide an oversight role on the works
Potential Project Co-Financing	Tuvalu MNRE budget ($200,000)
Other related projects and potential relationships	• Tuvalu environment budget for 2009 identifies $200,000 for coastal protection works for Funafuti • AusAid ICCAI project

BUDGET

Preferred NAPA Project Activity	Cost Components	Costs (USD)	Total
• Project to deal with coastal erosion on the islet of Tepuka. • Coastal Protection round the islet required. • Eroded parts range from 5m to 7m width • Land area 10.41 ha	• Nursery establishment and Mangrove planting • Elcorock – 1500 metres of protection calculated • Delivery and training • Coastal engineering consultant fees (proportional)	25 000 (Note 1) 378,000 (2520 bags) 10 000 10 000 194.	**423 000**


Tepuka, Tuvalu
Fongafale
Funafara
Image © 2009 DigitalGlobe
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
© 2009 Europa Technologies
©2009 Google
Imagery Date: Nov 10, 2005
8°31'17.20" S 179°07'23.85" E elev -81 ft
Eye alt 24.99 mi
Tepuka, Tuvalu
Image © 2009 DigitalGlobe
©2009 Google
Imagery Date: Nov 10, 2005
8°27'45.66" S 179°04'50.23" E elev 37 ft
Eye alt 3025 ft

b) Nanumaga

Title	Improved water supply and pulaka pit productivity
Location	Nanumaga
Summary	Seawater is intruding into pulaka pits during spring tides. Groundwater is constantly brackish. Pilot project proposes investigating salt-tolerant pulaka species and/or alternatives to protect crops from saline intrusion e.g lining pulaka pits. In concert with this, a system to carry fresh water to the pulaka pits will be investigated and installed to ensure a constant water supply.
Timing and Duration	To be advised
Budget	$149,600 USD (see notes below)
Outcomes/Outputs	Outcome will be the increased resilience of the community to increased salinity by protecting pulaka crops. Output will be increased pulaka production and installation of watering system for pulaka crops.
Adaptive Capacity Development	Community will be able to develop protection and enhancement measures for pulaka crops.
Feasibility	Highly feasible
Risks	Salt-tolerant crops not adequately developed. Pit protection only short term potentially. Potential introduction of pest species.
Need for Project	Pulaka is a traditional staple for the community and needs to be protected so that food security is ensured.
Partnerships	• Department of Agriculture in collaboration with Department of Environment • Island Care (Tuvaluan Environmental NGO) • Schools • Kaupule (Local Island Councils)
Potential Project Co-Financing	AusAid ICCAI project
Other related projects and potential relationships	• Community Tree Care Program • National Council of Women's planting program

BUDGET

Preferred NAPA Project Activity	Cost Components	Costs (USD)	Total

• Consider water supply improvements and potential lining of pulaka pits to revive agriculture
• Investigate and redesign seawall
• Following information received from local consultant:
  • Suggested to have a permanent seawall to break current
  • Area 50 x 100 metres being eroded at the southern end
  • Area 30 x 200 metres being eroded at the northern end
  • Requirement also to increase water storage
  • Suggested to build water storage at both ends of the island close to pulaka pits
  • Size required reasonably big so that drought period of 2-3months
  • Proven that water intrusion is the main problem.
	• Nursery establishment and Tree planting
	• Purchase of pulaka species or alternative crops
	• Feasible to line pit to prevent water intrusion – if so then cost of liner
	• Delivery costs for liner
	• Pump and water system
	• Delivery costs
	• Elcorock – 300 metres calculated
	• Delivery and training
	• Coastal engineering consultant fees (proportional)
		25 000
		10 000
		10 000
		2 000
		5 000
		2 000
		75 600 (504 bags)
		10 000
		10 000
			149 600


Nanumanga, Tuvalu
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image © 2009 DigitalGlobe
Image NASA
©2009 Google
Imagery Date: Nov 23, 2006
6°17'08.89" S 176°19'11.74" E elev 20 ft
Eye alt 21421 ft
Nanumanga, Tuvalu
Image © 2009 DigitalGlobe
©2009 Google
Imagery Date: Nov 23, 2006
6°17'08.89" S 176°19'01.51" E elev 38 ft
Eye alt 4596 ft

c) Nanumea

Title	Upgrade capacity of community water tanks
Location	Nanumea
Summary	Nanumea is facing lengthier droughts each year (November to March most recent) and households are finding it difficult to cope with water shortages. Each house now has an average of 10 people living in it with water storage capacity only around 1 – 2000 gallons. There are also 9 community water tanks for use when household shortages occur (7 on main island and 2 on islets). This pilot project proposes a significant increase in community water storage capacity.
Timing and Duration	To be advised
Budget	$20,000 USD (see budget notes below)
Outcomes/Outputs	The outcome of this pilot project will be to increase the community's resilience in times of drought. The output will be the installation of additional water tanks to provide increased community water storage capacity.
Adaptive Capacity Development	Community members will be trained to install water tanks
Feasibility	If tanks are to be constructed of ferro-cement then project is highly feasible. If tanks are to be the poly type, constructed in Funafuti, then there is an issue about how the tanks will be transported to Nanumea. The monthly cargo vessel is likely to have limited deck space to accommodate the tanks although it could be arranged subject to other cargo load requirements.
Risks	That poly tanks are unable to be transported to the island in which case ferro cement tanks may have to be constructed. Materials would also need to be transported in this case.
Need for Project	There is an urgent need to increase water holding capacity for the community given the increasing length of annual droughts.
Partnerships	PWD
Potential Project Co-Financing	IWRM/ AusAid / EU
Other related projects and potential relationships	IWRM project/ EU Water Project (EDF10)

BUDGET

Preferred NAPA Project Activity	Cost Components	Costs (USD)	Total
• Most urgent project is water storage • Large water tanks are required for both homes and the community tanks as current tanks are inadequate and are deteriorating	195. • Purchase of tanks/materials • Delivery to Nanumea • Installation/construction costs	196. 10,000 5,000 5,000	**20 000**

• Recommended size for community water Storage is 20m x 12m or alternatively 6 x 10,000L poly tanks			


Nanumea, Tuvalu
Nanumea
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
© 2009 Europa Technologies
Image © 2009 DigitalGlobe
Image NASA
Imagery Date: Jan 10, 2005
5°40'42.64" S 176°07'00.12" E elev 0 ft
Eye alt 22184 ft
Google

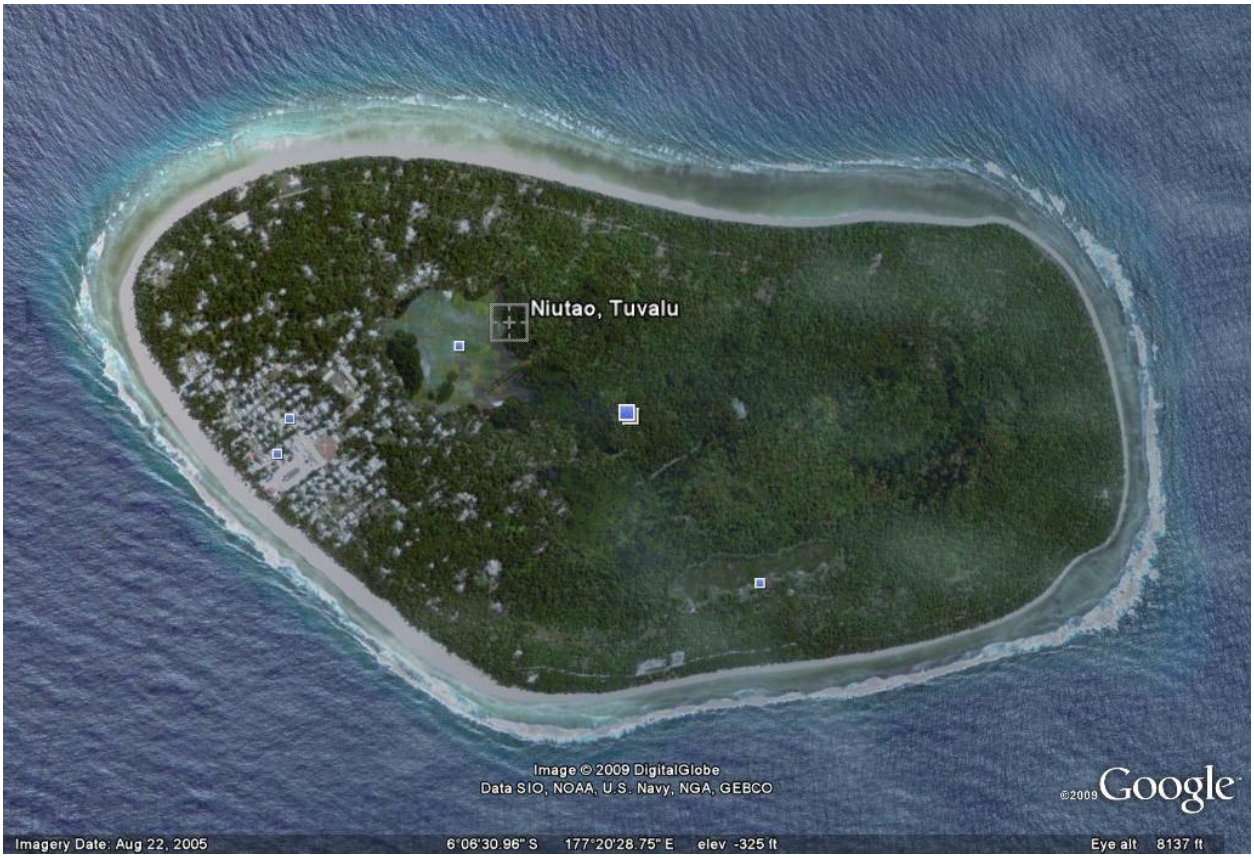

Moriapepe
Nanumea, Tuvalu
Nanumea
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
© 2009 Europa Technologies
Image © 2009 DigitalGlobe
Imagery Date: Jan 10, 2005
5°40'24.12" S 176°06'09.87" E elev -21 ft
Eye alt 36073 ft
Google

d) Niutao

Title	Sustainable pulaka crops and tree planting
Location	Niutao
Summary	Niutao is facing problems of coastal erosion and loss of pulaka productivity. Pulaka crops are being affected by salinity and salt-tolerant pulaka species are required. Salinity has increased since a road was constructed through the swamp area where pulaka is grown. Area is approximately 500 x 100 metres. The pilot project will investigate the status of salt-tolerant pulaka with the Department of Agriculture to pilot use of these species. Additionally, tree planting programs in the area of the island's cemetery will be supported to stabilize eroded areas. This site is called Tepale.
Timing and Duration	To be advised
Budget	$54,000 USD (see budget notes below)
Outcomes/Outputs	The outcome will be to halt the decline in pulaka crops by using salt-tolerant varieties and to stabilize a culturally important area of the island i.e the cemetery. The outputs will be increased pulaka crop production and a tree planting program to stabilize an eroded area.
Adaptive Capacity Development	Community will be introduced to new salt-tolerant pulaka species allowing for continuing and sustainable crop production. Community members will be able to continue to use new skills in nursery production and planting and maintenance of green belts through enhancement to, and support of, existing tree planting programs.
Feasibility	Highly feasible
Risks	That salt tolerant pulaka crop trials will not be sufficiently advanced to allow their use. That the cause of increasing swamp salinity is not addressed i.e engineering modifications may be required to the road to allow water flows within the swamp area to return to pre-road conditions. Introduction of pest species.
Need for Project	Community of 700 people relies on the pulaka pit for traditional crops. Cultural significance is attached to cemetery site (Tepale) so protection and rehabilitation is required. Swamps are dying through salinity.
Partnerships	• Department of Agriculture in collaboration with Department of Environment • Island Care (Tuvaluan Environmental NGO) • Schools • Kaupule (Local Island Councils) • SPC
Potential Project Co-Financing	To be identified
Other related projects and potential relationships	• Community Tree Care Program • Trials of salt-tolerant pulaka species by SPC

BUDGET

Preferred NAPA Project Activity	Cost Components	Costs (USD)	Total
• Restoration and rehabilitation of pulaka planting area • Community tree planting appropriate for coastal protection • Salt-tolerant plant species (including pulaka) highly desired 97.	• Nursery establishment and Tree planting • Purchase of pulaka species or alternative 98. If feasible to line pit to prevent water intrusion then cost of liner • Delivery costs for liner • Pump and water system • Delivery costs	25 000 10 000 10 000 2 000 5 000 2 000	**54 000**


Niutao, Tuvalu
Image © 2009 DigitalGlobe
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
©2009 Google
Imagery Date: Aug 22, 2005
6°06'30.96" S 177°20'28.75" E elev -325 ft
Eye alt 8137 ft

e) Nui

Title	Upgrade of community water tanks
Location	Nui
Summary	Nui community currently relies on 6 tanks for their water supply for a community of 600 people. There are wells and despite the water being marginal, not used for human use. Existing ferro cement water tanks are too small and are currently deteriorating Groundwater is contaminated from septic tanks. The pilot project will provide additional water storage capacity for community use.
Timing and Duration	To be advised
Budget	$20,000 USD (see budget notes below)
Outcomes/Outputs	The outcome of this pilot project will be to increase the community's resilience in times of drought. The output will be the installation of additional water tanks to provide increased community water storage.
Adaptive Capacity Development	Community members will be trained to install water tanks
Feasibility	If tanks are to be constructed of ferro-cement then project is highly feasible If tanks are to be the poly type, constructed in Funafuti, then there is a significant issue about how the tanks will be moved to Nui. The monthly cargo vessel is likely to have limited deck space to accommodate the tanks although it could be arranged.
Risks	That poly tanks are unable to be transported to the island in which case ferro cement tanks may have to be constructed from materials also needed to be transported to the island.
Need for Project	There is an urgent need to increase water holding capacity for the community given the increasing length of annual droughts.
Partnerships	PWD
Potential Project Co-Financing	IWRM/AusAid /EU
Other related projects and potential relationships	IWRM project/ EU Water Project (EDF10)

BUDGET

Preferred NAPA Project Activity	**Cost Components**	**Costs (USD)**	**Total**
• Water supply considered to be the number 1 priority. There are 6 small community water tanks which need to be upgraded • Recommend 6 x 10,000l tanks	• Purchase of tanks • Delivery to Nui • Installation costs	10,000 5,000 5,000	**20 000**


N
Image © 2009 DigitalGlobe
©2009 Google
Imagery Date: Dec 18, 2004
7°14'47.84" S 177°09'17.38" E elev -9 ft
Eye alt 8096 ft

f) Nukufetau

Title	Construct and place coastal protection and wavebreakers
Location	Nukufetau
Summary	The island is facing severe coastal erosion problems which have apparently been exacerbated by the removal of small boulders from the reef flat by community members for construction purposes. These boulders have previously absorbed wave energy and dampened the impact of waves onshore. The pilot project will construct and install replacement protection and wave breakers through soft engineering solutions in an attempt to reduce coastal erosion. Stabilisation of the coastal erosion may also be required.
Timing and Duration	To be advised
Budget	$120,600 USD (see budget notes below)
Outcomes/Outputs	The outcome will be a reduction or cessation of severe coastal erosion. The output will be a coastal defence system able to be replicated in locations suffering similar issues from similar causes.
Adaptive Capacity Development	Wavebreakers are purpose-built for a specific site. The wavebreakers and coastal defences for Nukufetaeu will be developed in consultation with the Kapaule and will be constructed and installed by the community with technical advice as required.
Feasibility	The installation of wavebreakers and coastal defences is based on a need identified by the Kapaule on Nukufetaeu i.e there has been no scientific or engineering investigation. However experience elsewhere has demonstrated that soft engineering interventions such as wavebreakers and coastal defences are a viable response to coastal erosion. Consequently this intervention, a relatively low cost option, is highly likely to have some effect on slowing coastal erosion.
Risks	That community members will remove the wavebreakers and coastal defences for personal use. That the primary cause of coastal erosion has not been adequately identified and that the issue may continue. Pest flora species introduced.
Need for Project	Coastal erosion has been identified by the community as the highest priority issue. In the absence of scientific or engineering studies of the issue then a short-medium term solution is required to either halt or slow down the rate of coastline loss.
Partnerships	PWD
Potential Project Co-Financing	Ausaid ICCAI project
Other related projects and potential relationships	U/K

BUDGET

Preferred NAPA Project Activity	**Cost Components**	**Costs (USD)**	**Total**
• Recommended project is construction and placement of wavebreakers and coastal defences to reduce wave energy on coastline and prevent coastal erosion	• Nursery establishment and Mangrove planting? • Elcorock– 300 metres calculated	25 000 75 600 (504 bags) 10,000 10,000	**120 600**

• Comments from local consultant: o Suggested to have a permanent seawall o Reclaim area between seawall and land o Dig out sand at lagoon side for reclamation o Dug out places become big pools for anchorage of little fishing boats o More than 10metres wide of the eroded land area o More than 300m long needed seawall	• Delivery and training • Coastal engineering consultant fees (proportional)		


Image © 2009 DigitalGlobe
©2009 Google
Imagery Date: Aug 17, 2005
8°01'48.40" S 178°18'42.57" E elev 18 ft
Eye alt 6062 ft
Nukufetau, Tuvalu
Lafaga
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
© 2009 Europa Technologies
Image © 2009 DigitalGlobe
©2009 Google
Imagery Date: Aug 17, 2005
7°59'26.40" S 178°21'00.93" E elev -1 ft
Eye alt 14.40 mi

g) Nukulaelae

Title	Stabilisation of coastal erosion
Location	Nukulaelae
Summary	The island is undergoing severe coastal erosion from both the lagoon and seaward sides and requires urgent intervention. An immediate short-medium term stabilization solution is required. The pilot project will provide this solution in the form of soft engineering e.g using geotextile bags filled with local materials. Some tree planting may also be required to provide further soil stability.
Timing and Duration	To be advised
Budget	$120,600 USD (see budget notes below)
Outcomes/Outputs	Outcome – coastline stabilized. Output – temporary barriers installed and vegetation planting undertaken in support of stabilization.
Adaptive Capacity Development	Nursery development, tree species selection and planting. Construction of coastal stability works using local human resources and materials.
Feasibility	Highly feasible
Risks	Use of local materials may create other problems unless materials are brought in from elsewhere. Introduction of pest flora species.
Need for Project	Urgent need to stabilize coastal areas around islands main road
Partnerships	• Department of Agriculture in collaboration with Department of Environment • Island Care (Tuvaluan Environmental NGO) • Schools • Kaupule (Local Island Councils)
Potential Project Co-Financing	AusAid ICCAI project
Other related projects and potential relationships	• Community Tree Care Program • National Council of Women's planting program

BUDGET

Preferred NAPA Project Activity	**Cost Components**	**Costs (USD)**	**Total**
• Need to stabilize erosion affected area urgently • Then followup with long term coastal zone protection program • Following advice from local consultant o Building seawall of big stones and logs in the past o Recently they shifted blocks to the eroded	• Nursery establishment and Mangrove planting • Elcorock– 300 metres calculated • Delivery and training • Coastal engineering consultant fees (proportional)	25 000 75 600 (504 bags) 10 000 10 000	**120 600**

parts about 5m. ○ One eroded area 10 x 100 metres ○ Northern end of the main settlement at lagoon side area of erosion about 5 x 200metres			

h) Vaitupu

Title	Increased water transfer transport capacity
Location	Vaitupu
Summary	Vaitupu community relies primarily on water from a well on the northern side of the island which needs to be transferred approximately 7 kilometres to the community. There is currently a small water tanker which is towed by tractor to the community water supply. The pilot project proposes to supply a larger water tanker to allow the community to have increased water supplies available in the community. There are two options – 1) to purchase or have constructed, a larger water tanker to be towed by a community tractor. A review of the condition of the current well pump will need to be made also to ensure that it is able to continue pumping water. 2) an alternative is to construct a pipeline. However the drawbacks of such an option are that an increased pumping capacity will be required and that the pipeline could be prone to failure through natural or man-made activities.
Timing and Duration	To be advised
Budget	$30,000 USD (see budget notes below)
Outcomes/Outputs	The outcome of the pilot project will be an increased and enhanced capacity for the community to meet water use needs. The output of the pilot project will be an increase in capacity for water transfer.
Adaptive Capacity Development	The increase in available water will increase the capacity of the community to adapt to water shortages in the future.
Feasibility	Proposed project option 1 is highly feasible and is the preferred option. Option 2 is less feasible and is not recommended.
Risks	Risks include potential drying up of well, of the well becoming saline, of the community wanting to increase water use thereby rendering any increased capacity redundant.
Need for Project	1000 people live on the island and need access to the groundwater drawn from the well. Current water supply is inadequate for community use.
Partnerships	PWD
Potential Project Co-Financing	IWRM/AusAid / EU
Other related projects and potential relationships	IWRM project/EU Water Project (EDF10)

BUDGET

Preferred NAPA Project Activity	**Cost Components**	**Costs (USD)**	**Total**
• Appears that most logical project is a large tanker trailer and tractor to haul water to the community • 2000 litre water tanker requested	• Purchase of water tanker • Delivery to Vaitupu • Installation/engineering costs	**10,000** **5,000** **5 000**	**30, 000**


Vaitupu, Tuvalu
Tuvalu
Vaitupu
Vaitupu
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
© 2009 Europa Technologies
Image © 2009 DigitalGlobe
Image NASA
©2009 Google
Imagery Date: Feb 11, 2004
7°28'46.27" S 178°40'29.16" E elev 41 ft
Eye alt 20127 ft

Annex 6: Professional Inputs to the Project