# REPORT OF THE AUDITOR-GENERAL

# PERFORMANCE AUDIT ON

# CLIMATE CHANGE ADAPTATION ACTIONS- FUNAFUTI RECLAIM LAND

Date: 16/06/2025

Submitted to: Parliament

Picture Credit: TCAP.

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## List of Acronyms

| | |
|---|---|
| UN | United Nations |
| SDG | Sustainable Development Goal |
| TNSSD | Tuvalu National Strategy for Sustainable Development |
| TCAP | Tuvalu Coastal Adaptation Plan |
| CCAA | Climate Change Adaptation Action |
| LTAP | Long Term Adaptation Plan |
| GCF | Green Climate Fund |
| FAA | Fund Activity Agreement |
| UNDP | United Nation Developing Program |
| A-G | Auditor-General |
| PMU | Project Management Unit |
| TOAG | Tuvalu Office of the Auditor-General |
| SAI | Supreme Audit Institution |
| MHACCE | Ministry of Home Affairs Climate Change and Environment |
| PWD | Public Works Department |
| CCD | Climate Change Department |

# 1.0 EXECUTIVE SUMMARY

Tuvalu is extremely vulnerable to climate change, particularly sea level rise. The average height of land is only half a metre above the reach of normal high tides, and the atolls are storm wave exposed. NASA Scientist predicted that by 2050, half the land area of the capital, Funafuti, is forecast to become flooded by daily tidal waters, and by 2100, 95 per cent of the land area is forecast to be flooded by routine high tides.

The Tuvalu Coastal Adaptation Project (TCAP), financed by the Green Climate Fund (GCF), was approved in June 2016 and implementation commenced on 7 June 2017. The total GCF funds for the project are US$36,010,000 with Government of Tuvalu co-financing of US$2,860,000; however, this contribution was reduced to US$606,839 due to delays in construction, primarily caused by the COVID-19 pandemic. The primary focus of the project is to put in place robust coastal protection measures in the three islands of Funafuti, Nanumea and Nanumaga; and, through building institutional and community-level capacities, to prepare for the impact of increasingly intensive wave actions in the country.

This audit examined the effectiveness of the new reclamation-land implemented on Funafuti as part of the Tuvalu Coastal Adaptation Project (TCAP) in reducing the vulnerability of key coastal infrastructure on Funafuti to wave induced damages. Half of the population of Tuvalu lives on Funafuti and the Funafuti Land Reclamation Project is a significant component of the TCAP, costing around USD$13 million. We looked at whether there was a well-formed plan for reclaiming the land on Funafuti, whether the land was reclaimed as intended, and whether the intended benefits of reclaiming the land are being realised and sustained.

The Office of the Auditor General of Tuvalu has conducted this audit as part of a global cooperative audit initiative known as the Cooperative Audit on Climate Change Adaptation Actions (CCAA). The CCAA audit is coordinated by two organizations within the International Organization of Supreme Audit Institutions (INTOSAI), namely the INTOSAI Development Initiative (IDI) and the INTOSAI Working Group on Environmental Auditing (WGEA).

Under the initiative, 48 Supreme Audit Institutions (SAIs) undertook a CCAA audit during 2024 in one of four topic areas – implementing climate change adaptation plans or actions, disaster risk recovery, water resource management, and sea level rise and coastal erosion. Nine SAIs in the Pacific region are taking part in the CCAA project, along with SAIs from Europe, Africa, Asia, the Caribbean, South America and Canada. The IDI and WGEA have supported the SAIs in conducting their audits.

In 2025, after the SAIs have completed and published their audits a global overview report will be prepared for presentation to international stakeholders and events including the 2025 United Nations Climate Change Conference (COP30) in November 2025. As well, a regional overview report will be prepared about the results of the CCAA audits in the Pacific region.

The Office of the auditor general of Tuvalu conducted their audit in accordance with the International Standards of Supreme Audit Institutions. These standards require that we plan and perform the audit to obtain reasonable assurance about the topic that we are auditing until

we believe that the audit evidence that we have obtained, is sufficient and appropriate to provide conclusion for the audit.

There was a well-formed plan for reclaiming the land along the Funafuti foreshore. The plan covered the design of the reclaimed land, project implementation, project governance and oversight, procurement strategies, and the availability and use of resources. The plan was informed by a feasibility study (Scoping Study) first to identify options and confirm the engineering ability to achieve the desired outcomes, followed by an Environmental and Social Impact Assessment that considered options. Key decisions about reclaiming land being the preferred option, and the location of the reclaimed land, were taken in consultation with stakeholders and were influenced by stakeholders' views, including marginalized groups.

Overall, the reclaimed plan was built to plan, with one agreed change to mainly accommodate the needs of local people. The contactor made some fixes to the geosynthetic sand container armor units during the defect liability period, and there have been unexpected disadvantages for some households near the reclaimed land associated with drainage problems along the reclaimed land and flooding of the main access road. Fixing the drainage and access road will ensure the safety and satisfaction of the local community. Continuous monitoring and maintenance will also be necessary to ensure the long-term success and sustainability of the reclaimed land and associated structures.

The Covid 19 pandemic caused some disruption, delays and additional costs to the project, which planning did not anticipate or include mitigations for. The pandemic was a high-impact event difficult to predict and was a timely reminder of the need for planning of major projects such as the reclamation of the land to consider worst case scenarios and include some contingencies for these scenarios in contracts and funding agreements to mitigate their effects, where possible.

Early benefits from the reclaimed land, including to livelihoods and the local ecosystem, are being experienced. The primary goal of the project was to reduce the vulnerability of key coastal infrastructure on Funafuti to wave induced. The provision of additional developable land is actually a secondary although significant benefit. For the intended benefits of the reclaimed land to be fully realized and sustained for the people of Funafuti and Tuvalu, active long-term management of the land and realization of the intended benefits is needed, to maximize its potential. Responsibilities for ensuring that the land is well managed, and the intended benefits are achieved need to be clarified, and monitoring and reporting mechanisms put in place to provide accountability and transparency, including over any unintended consequences of the reclaimed land and how they are being addressed. Community involvement will be critical to conservation and sustainable use of the land to provide ongoing benefits to them, including benefits to women.

Our audit makes recommendations to support fixing of the short-term drainage problems along the reclaimed land and flooding of the main access road, and effective long-term management and maintenance of the land, and achievement of sustainable benefits from it.

We thank the TCAP Management Unit and the Funafuti communities living near the reclaimed land for their cooperation and assistance during this audit.

## 2.0 RECOMMENDATIONS

We recommend that the MHACCE through the Climate Change Department and TCAP to work with the PWD to:

- conducts a thorough assessment of the state of drainage along the reclaimed land to identify the extent of erosion and associated drainage problems and implements corrective measures.
- conducts a thorough assessment of the state of the main access road to identify the extent of structural concerns and associated flooding problems and implements corrective measures.
- puts in place a regular inspection and funded maintenance programme for the geosynthetic sand container armor units, drainage, access road and other infrastructure along the reclaimed land to ensure that they provide effective mitigation of the impacts of wave action over time.
- maintains regular and open communication with households living alongside the reclaimed land to identify and resolve problems affecting them associated with maintenance of the reclaimed land quickly and effectively, wherever possible.

We recommend that the TCAP PMU reviews the risk management plans for other ongoing TCAP projects to ensure that they cover all plausible worst-case scenarios and include practical mitigation actions for these scenarios to reduce their impact on timely, cost-effective project completion, wherever possible.

We recommend that the MHACCE through the Climate Change Department and TCAP to work with the PWD to:

- implements a long-term monitoring program to assess the ongoing effectiveness of the reclaimed land in preventing erosion and its impact on the local ecosystem.
- implements a maintenance and management plan to support the ecological health of the land, prevent land degradation and ensure its sustainable use.
- regularly reports publicly on how well the intended benefits from the reclaimed land are being realized and maximized over time, and how any intended consequences are being addressed; and
- engages the community in ongoing management and maintenance of the land, including gathering feedback and suggestions for improvements, and encouraging responsible and sustainable land use practices and coastal conservation measures.

We further recommend that the MHACCE, in collaboration with the Funafuti Island community, promptly resolve the issue of land ownership. Clarifying this is essential to ensure effective, long-term management and maintenance of the reclaimed land, and to maximize its intended benefits for the people of Tuvalu.

MHACCE, CLIMATE CHANGE, TCAP and PWD Management – Agree or Disagree and Comments

- The TCAP design only needed to provide a self-draining surface so that future development of the new land could occur. Development of the land will completely alter

the drainage patterns/paths as the required earthworks will change the reclamation's surface topography. Therefore, it is important that effort is put into agreeing/formalizing the proposed layout of roads and other infrastructure so that permanent drainage networks can be established.

- TCAP has provide training for the relevant stakeholders from the government and providing them with the manuals for the operation and Maintenance (O&M)
- The erosion is at small scale partly occurred due to movement of heavy machinery on the land while relocating containers. After the removal of containers, the areas eroded will be fixed and planted with appropriate species of plants to reduce erosion. For long term the government and community should ensure the monitoring and timely fixing the issue

# 3.0 INTRODUCTION

## 3.1 Background

Tuvalu is the fourth-smallest nation in the world. It comprises nine inhabited islands with a population of about 11 thousand and a total land area of 26km$^2$. Funafuti atoll, where the nation's capital is located, is home to about half the population. With extremely low elevations above sea level, Tuvalu is one of the most vulnerable countries in the world to the impacts of climate change in the form of sea level rise, inundation, and extreme weather events. This high level of vulnerability, along with general development challenges, are likely to have severe long-term effects on sustainable development in the country.

## 3.2 The Tuvalu Coastal Adaptation Project

The Government of Tuvalu (GoT) has received funding from the Green Climate Fund (GCF) for the Tuvalu Coastal Adaptation Project (TCAP) to implement measures that are urgently required to reduce the impact of increasingly intensive wave action on key infrastructure as a result of climate change-induced sea-level rise and intensifying storm events. Building coastal resilience is an urgent national priority, and the formulation of this 7.5-year project has been led at the highest political level by a Technical Working Group (TWG) comprising key government departments and non-governmental organizations (NGOs) representing vulnerable communities. The Funded Activity Agreement (FAA) effectiveness date was 7 June 2017 (FAA Amendment effective from 3 January 2020), while the project document was signed on the 14 June 2017.

Implemented by the United Nations Development Programme (UNDP) in partnership with the GoT, TCAP's overall objective is to reduce the vulnerability of Tuvalu to coastal hazards associated with climate change and sea level rise. Three islands – Nanumaga, Nanumea and Funafuti are to receive construction of hard and/or soft coastal protection infrastructure to enhance coastal adaptation and reduce inundation and coastal erosion.

It is expected that TCAP will make 35% of high-value vulnerable coastline (3.0 km in length) more resilient to the effects of increased wave intensity and sea level rise. TCAP target areas have a high concentration of settlements with expected direct benefits to 3,100 people, or 29% of Tuvalu's population.

While the construction of physical defences is considered one of the urgent actions required to reduce Tuvalu's extreme vulnerability to climate change, particularly sea level rise, the GoT is acutely aware that there is a considerable need to invest in long-term resilience of the country and that it can only be achieved by strengthening the capacity of each of the nine islands to identify, plan for and execute locally-relevant adaptation actions. The TCAP also accordingly contains a component whereby island councils (Kaupules) and communities will receive assistance in facilitating participatory consultations, identifying climate change adaptation priorities, reflecting on the priorities in the island investment plan, executing priority actions and monitoring results. TCAP is expected to strengthen institutional and community capacity for sustaining and replicating project results.

The project has three inter-related outcomes that aim not only to achieve impact potential but also to enable conditions for scaling up and replicating the project impact beyond the immediate target areas. All these outcomes contribute to strengthening climate-resilient sustainable development of the country:

- reduced vulnerabilities of Tuvalu to future impacts of climate change;
- reduced loss from potential natural disasters; and
- enhanced livelihoods, and food and water security.

On Funafuti, land reclamation on the lagoon shore of Fogafale Island was proposed as the most appropriate coastal adaptation/protection solution. The proposed reclamation started from the northern boundary of the Queen Elizabeth Park (QEP) reclamation area and extended to the northern Tausoa Beach groin (see Figure 1). It extended seaward to a similar extent as QEP and its overall dimensions were approximately 710m in length by 100m wide, giving a total area of approximately 7.1Ha (17.5 acres). The proposed reclamation required approximately 250,000m$^3$ of fill material.

Figure 1: TCAP Reclamation design plan for Funafuti (TCAP website).


## 3.3 Why we performed the Performance audit

Section 26.1 of the Audit Act states that the Auditor-General at his or her discretion shall conduct a performance audit of all or any particular activities of a public sector entity. We

conducted this audit because of the scale and importance of TCAP and to review and report on the effectiveness of this kind of adaptation action for Tuvalu. The Government of Tuvalu has identified reclaimed land as one of the ways to mitigate the impacts of climate change (sea lea risk and recurrent king tides and control the costal erosion) and in addition provide much needed land for constructions. Under the long-term adaptation plan (LTAP) for Funafuti, there is more reclaimed land that the government plans to build, and this audit will help to highlight lessons from TCAP for further land reclamation.

### 3.4 The audit's objective and scope

The objective of the audit was to assess the effectiveness of the new reclamation-land implemented as part of the Tuvalu Coastal Adaptation Project (TCAP) in reducing the vulnerability of key coastal infrastructure on Funafuti to wave induced damages.

The audit focused on the new reclaimed land built under the TCAP on Funafuti from 2022 to 2023. Specifically, the reclaimed land located at the lagoon shore of Fogafale Island starting from the northern boundary of the Queen Elizabeth Park reclamation area up to the Tausoa Beach Groin. The audit looked at whether there was a well-formed plan for reclaiming the land, whether the land was reclaimed as intended, and whether the intended benefits of the reclaimed land are being realised and sustained.

The audit did not look at other parts of TCAP on the islands of Nanumea and Nanumaga, and did not cover financial management of TCAP.

How we undertook the audit is summarised in Appendix 1.

### 3.5 Entities audited and consulted and their responsibilities.

| Entities | Responsibilities |
|---|---|
| TCAP | The **Tuvalu Coastal Adaptation Project (TCAP) Management Unit** plays a central role in the implementation, coordination, and oversight of all project activities aimed at increasing Tuvalu's resilience to coastal hazards. Its primary responsibilities include **planning, managing, and monitoring** the execution of infrastructure works—such as coastal protection, land reclamation, and drainage improvements—in line with the project's objectives and funding agreements (primarily through the Green Climate Fund and the Government of Tuvalu).<br><br>Key functions of the TCAP Management Unit include:<br><br>• **Project coordination:** Ensuring that all components—engineering, environmental safeguards, procurement, financial management, and community engagement—are executed cohesively and on schedule. |

| Entities | Responsibilities |
|---|---|
| | • **Stakeholder engagement:** Working with local communities, contractors, government agencies, and donors to ensure inclusive participation and transparency throughout project delivery.<br>• **Compliance and reporting:** Overseeing environmental and social safeguards (e.g., ESIA), ensuring compliance with national and donor standards, and submitting regular progress and financial reports.<br>• **Problem-solving and supervision:** Addressing on-the-ground challenges such as design changes, erosion, or drainage issues, and supervising contractors' work quality and timelines.<br><br>Overall, the TCAP Management Unit acts as the **operational and technical backbone** of the project, ensuring that coastal adaptation efforts are effective, sustainable, and aligned with Tuvalu's national climate resilience goals. |
| | |

## 3.6 AUDIT QUESTIONS

Audit question 1. Was there a well-formed plan for implementing the new- reclamation land?

Audit question 2. Was the new reclamation-land implemented as intended?

Audit question 3. Are the intended benefits of the new reclamation-land being realised and sustained?

## 3.7 AUDIT CRITERIA

There was a proper audit plan in place.

There was an Environmental & Social Impact Assessment done.

All relevant stakeholder and the marginalized group were engaged in Consultation.

There are necessary resources allocated and utilized effectively

Delays and changes in the project timeline were properly dealt with

The Reclaimed land build according to the Plan.

The anticipated benefits of the reclaimed land been realized.

Mechanism in place to monitor the performance of the reclamation land.

### 3.8 Audit Approach

The Audit will be conducted using a Result Oriented Approach. Due to the fact that we are measuring the effectiveness of the adaptation measure, thus the audit will have to look at the result of the adaptation measure.

### 3.9 AUDIT METHODOLOGY

For this audit, the team will rely mostly on interview of key responsible officers, direct observation of the reclaimed land, and analysis of reports available on the TCAP website. We will also be conducting interviews with the communities on Funafuti on how their lives were affected by the measures.

## 4.0 PLANNING RECLAIMATION OF THE LAND

In this part of the report, we examine whether there was a well-formed plan for implementing the reclaimed land and cover whether:

- there was a proper plan in place.
- there was an Environmental & Social Impact Assessment done.
- all relevant stakeholder and the marginalized group were engaged in consultation; and
- resources were planned to be allocated and utilized effectively.

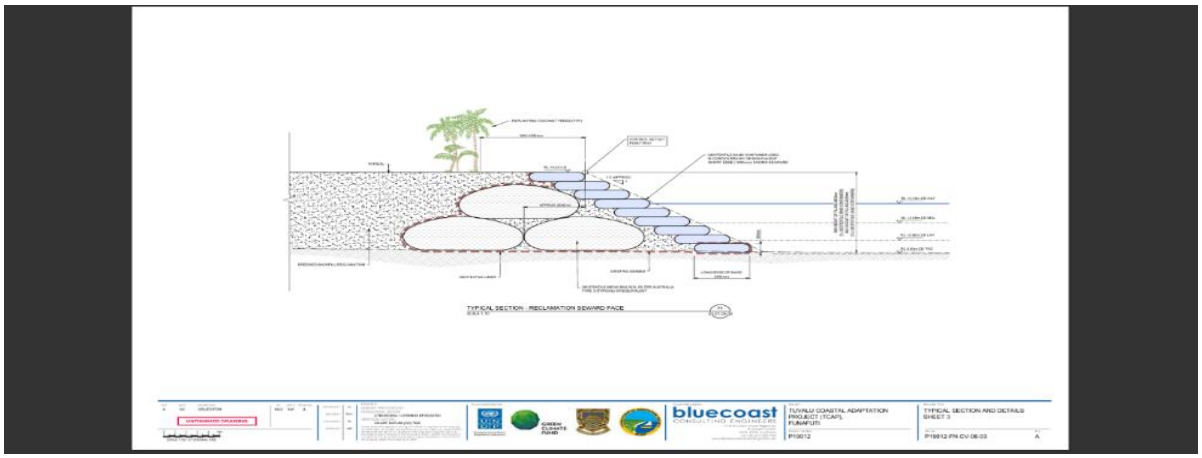
### 4.1 Plan in place

Having a comprehensive and well-structured plan in place is vital for effective construction of reclaimed land. A detailed plan helps identify potential risks and challenges associated with the reclamation process and how to mitigate their impact, ensuring a smoother implementation. Proper planning is essential for minimizing the environmental impact of reclamation activities and ensuring the long-term viability of the reclaimed land. A clear plan also facilitates better communication among stakeholders, providing a common framework for discussing progress, addressing concerns, and making informed decisions throughout the reclamation process.

We examined the plan for the reclaimed land, the Funafuti Foreshore plan *(Report No: P19012 Detailed Design_ FUN_R1.00).* The plan includes sections explaining the design of the reclaimed land, project implementation details, project governance and oversight, procurement strategies, and the Construction Environmental and Social Management Plan.

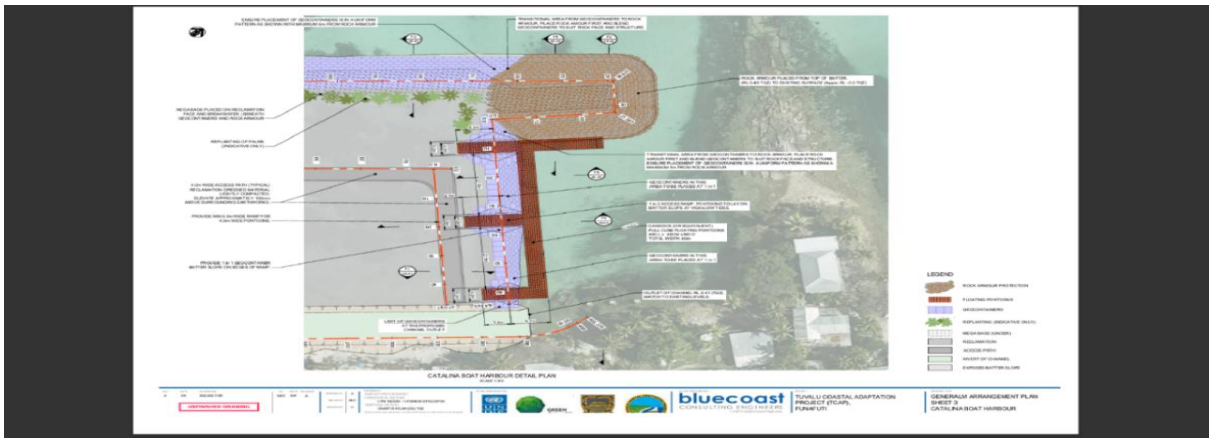
For example, the plan explains that the lagoon foreshore of the reclaimed land will be hardened with a well-designed and well-built retaining wall (bunding). The concept design of the bunding will be formed from geotextile mega bags overlaid with a protective layer of smaller geotextile bags (see Figure 2). The surface of the reclaimed area will be graded to drain into stormwater channels on the landward side. The drains will be open channel drains with crossing points provided at intervals along its length. The open channel drains will be designed such that overland flow through the existing coastal village (of Vaiaku) will also drain into the channel.

Figure 2. Funafuti Reclaim land Mega Bag Retaining Structure. Source (TCAP Funafuti Detail Design Report).




The plan also explains that the TCAP reclamation works will incorporate improvements to the small boat harbour at the northern end of the reclamation area, at the site of the existing Catalina Harbour and boat ramp area (see Figure 3). The harbour will be protected by a breakwater made from rocks and will be fitted with bollards along its length for securing vessels. The harbour wall will be approximately 70m long and will be able to berth small fishing vessels typically used in the area. The harbour will be accessible at all tides, it will be a public facility, and the primary point of access from land will be over the reclaimed area.

Figure 3. Catalina Harbor (TCAP Funafuti Detail Design Report).




## 4.2 Environmental & Social Impact Assessment

An Environmental and Social Impact Assessment (ESIA) is a critical process for understanding and managing the potential effects of a project on both the environment and surrounding communities. The audit did not look at the implementation of ESIA management plan. ESIA is expected to be carried out to ensure that risks such as land degradation, loss of biodiversity, or social disruption are identified early and addressed appropriately. Such assessments help decision-makers weigh environmental and social considerations alongside economic goals,

promoting more sustainable and responsible development. They also ensure that local communities are consulted and that mitigation measures are in place to minimize harm. Without an ESIA, a project may unintentionally cause long-term damage or face resistance from affected stakeholders.

We examined the 2020 Environmental and Social Impact Assessment (ESIA) and the Environment Social Mangement Plan (ESMP) for Funafuti. This was prepared in response to Tuvaluan law with the overall aim to provide an Environmental and Social Impact Assessment for all project elements on Funafuti, including ancillary sites and activities for the works. It provides a description of the baseline conditions and details the predicted qualitative and quantitative impacts of the project activities. It also provides the set of mitigation, monitoring, and institutional measures to be taken during the implementation of TCAP. The ESIA is guided by human rights, gender equality land. environmental sustainability principles as emphasised in the following resources: GCF Environment and Social Policy, UNDP Social and Environmental Standards and all relevant applicable laws of Tuvalu.

Options for fulfilling the TCAP objective of reducing the vulnerability to coastal inundation and erosion were considered, including beach nourishment, revert to foreshore seawall, breakwater and reclamation land. The preferred option identified was to directly replace and protect approximately 780m of lagoon shoreline in the Central Fogafale area through reclamation. This decision came after considering a request from local communities that the plan include reclamation land to have more space for constructions and other activities.

Several intervention locations along the high value lagoon shore were assessed (Figure 4). The scoping report identified that of the 'zones' along the high value coast, either zones 3 and 4, or zone 6 were those that would be most suitable for TCAP to target under the project.

Figure 4. High value shoreline of Funafuti zoned and discussed to inform the final location selection of TCAP. (TCAP Technical Report: Evaluation of Priorities and Options to Address Coastal Hazards in Fogafale).


Zones 3 and 4 currently have a buffer of a sand beach providing them with some level of resilience to marine flooding; however, the beach is artificial and without ongoing and

substantive nourishment works, it will eventually be lost though erosion, which will increase the vulnerability of this shoreline zone significantly.

In zone 6, the shoreline runs very close to a number of properties and also to the main road. There is very little in the way of a buffer between the lagoon and the infrastructure, making this a vulnerable section of the developed shoreline. Zone 6 is also the longest stretch of vulnerable coastline.

Ultimately, the decision over which zone to target under TCAP works was determined by the available budget and the understanding that, for the most effective and complete intervention with the available funds, zones 3 and 4 were the only viable and constructive option. This decision was also balanced with the fact that the GoT does have plans for ongoing reclamation along the lagoon foreshore, and this will eventually include works in zone 6. The decision to target zones 3 and 4 was made collaboratively with the government and other key stakeholders, after weighing up all the options.

### 4.3. Consultation with stakeholders, including the marginalized groups.

As TCAP is financed by the Green Climate Fund and the Government of Tuvalu and is Implemented by the UN Development Program (UNDP) in partnership with the Government of Tuvalu, under the Ministry of Finance through the Department of Climate Change, it is a requirement that the TCAP must follow GCF and UNDP policy requirements.

Under the UNDP Requirement, the UNDP is committed to meaningful, effective, and informed stakeholder engagement in the design and implementation of all UNDP projects. This includes participation and inclusion where every person and all peoples are entitled to active, free and meaningful participation in, contribution to, and enjoyment of civil, economic, social, cultural and political development in which human rights and fundamental freedoms can be realized.

Under the GCF Requirement, the GCF seeks to ensure the greatest degree of transparency in all its activities through the effective dissemination of information to stakeholders and the public at large. The GCF also requires that culturally appropriate, meaningful consultation/discussions are undertaken throughout the life cycle of activities, with information provided and disclosed in a timely manner, in an understandable format, in appropriate local languages, gender inclusive and responsive, free from coercion, and incorporates the views of stakeholders in the decision-making process. The processes should pay particular attention to vulnerable groups and to conducting consultations and sharing sessions in a manner that does not put vulnerable individuals and groups at risk.

We found records of consultations with Funafuti Key Stakeholders including marginalized groups and people with disabilities on the Draft ESIA report 27th October – 2nd November 2020. The Stakeholder Engagement Plan & Grievance Redress Mechanism 2021 report highlighted important information about TCAP stakeholders. The TCAP Management Unit made an analysis of their key stakeholders, and the analysis is shown in Figure 5. Marginalized groups and those with disabilities are identified as key stakeholders who are very important to the project and have a high degree of influence over the project.

As noted earlier, key decisions about reclaiming land being the preferred option, and the location of the reclaimed land, were taken in consultation with stakeholders and were influenced by stakeholders' views. However, some concerns and questions raised during the Funafuti ESIA consultation report have not yet been addressed (see Part 6).

We conducted a survey interviewing several individuals who live along the coastal area adjacent to the reclaimed land. All of those we interviewed supported the building of the reclaimed land and had knowledge of the project as they were involved in consultation.

Figure 5: Analysis of Stakeholder (TCAP stakeholders & Grievances Redress Mechanism).

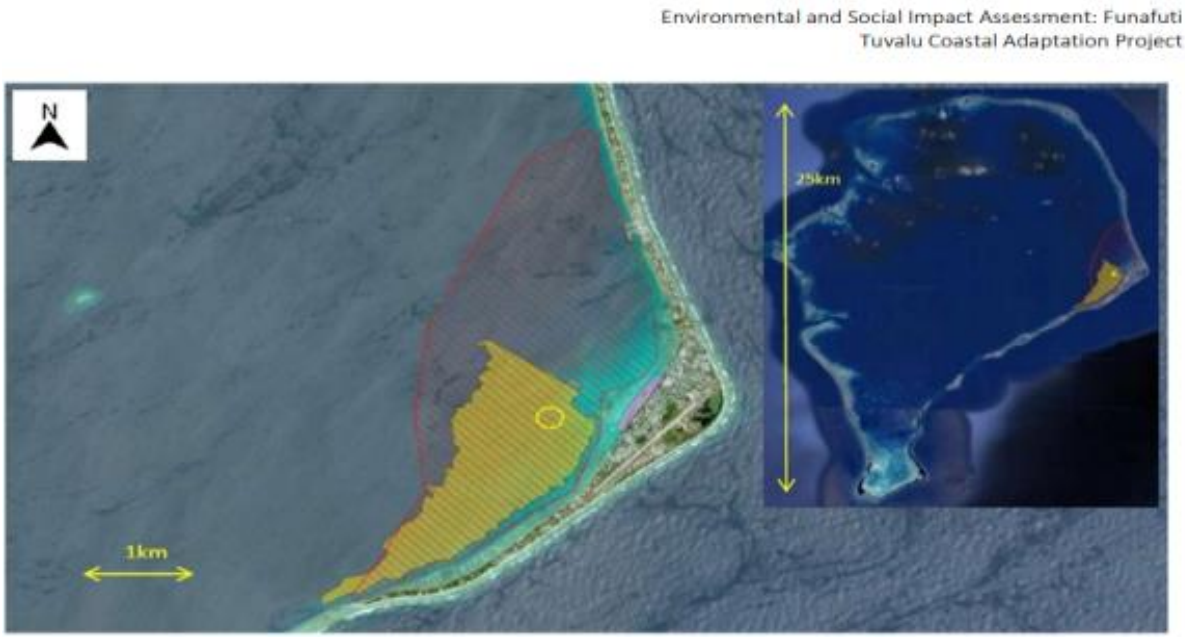
| **Stakeholders** | **Interests** at stake in relation to project | **Effect** of project on interests (+, 0, -) | **Importance of stakeholder for success of project**<br>1 = little/no importance<br>2 = some importance<br>3 = moderate importance<br>4 = very important<br>5 = critical player | **Degree of influence of stakeholder over project**<br>1 = little/no importance<br>2 = some importance<br>3 = moderate importance<br>4 = very important<br>5 = critical player |
|---|---|---|---|---|
| GCF | Reputation | + | 4 | 5 |
| UNDP | Reputation | + | 4 | 5 |
| Project Team | Reputation | + | 5 | 4 |
| Government of Tuvalu | Reputation and capacity to plan/implement<br>Training | + | 5 | 5 |
| Local government and traditional leaders | Voice of the communities – exposing positives and negatives of the project<br>Active participation to share knowledge<br>Welfare of local communities | + | 5 | 5 |
| Island communities and beneficiaries | Enhanced resilience through reduced climate impacts<br>Ownership for longevity of action | + | 4 | 4 |
| Directly affected landholders | Protection of assets and/or loss of land or trees<br>Key role in maintenance of infrastructure | 0 | 5 | 5 |
| Project contractors and workers | Safety and ability to deliver<br>Maintenance of infrastructure | 0 | 4 | 4 |
| Women's and youths' organizations, people with disability | Gender equity and employment opportunities | + | 4 | 4 |
| Civil society groups and local NGOs | Environmental and social issues | 0 | 4 | |

## 4.4 Planned allocation and use of resources

The main resource required for building the reclaimed land was sand. An estimated 250,000$m^3$ of suitable fill material was planned to be extracted from the Funafuti lagoon using a suitable dredge. Dredging of similar scaled volumes has proven to be cost effective and successful in the past.

A suitably experienced and qualified contractor would be required to comply with the ESIA in completing the works. The ESIA identified a primary resource area (see Figure 6) with a sediment volume of 24 million $m^3$, and an indicative location for the proposed TCAP aggregate source area (shown by the yellow circle in Figure 6). The volume of sediment required for the TCAP reclamation (250,000$m^3$) accounted for only 1% of the total identified resource in the primary resource area. Therefore, there would be enough material for the reclaimed land.

Figure 6. Indicative location of the proposed TCAP aggregate source area shown by the yellow circle. The yellow polygon is the primary resource area.




In terms of machinery, human and technical resources, these were the responsibilities of the contractor. The HALL company was selected as the contractor to build the reclaimed land. It was the responsibility of the contractor to procure their machinery, technical experts and labor. Within the contract, it was a requirement that the contractor must provide opportunities for people living in Tuvalu to work on the project.

## 4.5 Conclusion on planning the reclamation of the land.

There was a well-formed plan for reclaiming the land along the Funafuti foreshore. The plan covered the design of the reclaimed land, project implementation, project governance and oversight, procurement strategies, and the availability and use of resources. The plan was informed by an Environmental and Social Impact Assessment that considered options. Key decisions about reclaiming land being the preferred option, and the location of the reclaimed

land, were taken in consultation with stakeholders and were influenced by stakeholders' views, including marginalized groups.

The Covid 19 pandemic caused some disruption, delays and additional costs to the project, discussed in Part 4, which planning did not anticipate or include mitigations for. The pandemic was a high-impact event difficult to predict and was a timely reminder of the need for planning of major projects such as the reclamation of the land to consider worst case scenarios and include some contingencies for these scenarios, where possible.

TCAP Agree or Disagree and Comments

TCAP ENGINEER: Agree. Well-laid plans were made and followed as best as possible. Covid-19 caused unseen delay and project costs. Land ownership disputes and the GoTs promise to hand the land to the Funafuti Kaupule change the receiving stakeholder group from the GoT/whole of Tuvalu population to the Funafuti Kaupule. This unforeseen change affected attitudes around project objectives and design changes were made especially around main access points which in term affected initial drainage designs,

Safeguards: For a project of this scale, TCAP has been delivered with remarkably few variations and relatively minor schedule impacts, with the exception of COVID19. A global event of the scale of COVID19 could not have been anticipated, nor could the response of GoT to COVID19 ie total lockdown of Tuvalu, therefore it is unreasonable to expect such events in be included in project planning (note, other potential events such as cyclones were factored into the plan). However, the management structure and planning was sufficiently flexible that through the combined efforts of GoT, GCF, TCAP team and Hall the project was able to continue to progress during COVID19 lockdown so that rapid deployment was made as soon as people and equipment were once again allowed into the country. The lesson here is to ensure that there is good open communication between all parties and that everyone works towards common goals.

# 5.0 RECLAIMING THE LAND

In this part of the report, we examine whether:

- the reclaimed land was built according to the plan; and
- changes to the project timeline and costs were properly dealt with.

## 5.1 Build of the reclaimed land compared to the planned build.

Building according to the approved plans ensures that construction meets the planned quality specifications, including safety standards and regulatory requirements, fosters trust within the community, and avoids delays and budget overruns. Overall, the reclaimed plan was mostly built to plan. There was an agreed change to the design, the contactor made some fixes during the defect liability period, and there have been some unexpected disadvantages for some households near the reclaimed land.

Agreed change to build

The floating pontoon at the Catalina harbor was built differently to the one in the design structure. Figures 7 and 8 show the difference between the design (Figure 7) and the actual structure (Figure 8). The change was made to mainly accommodate the needs of local people and was passed by the board after several consultations with local representatives. TCAP management unit added that the modular design of the pontoon system allows it to be reconfigured at any time to suit the needs of community of users. The modular system chosen is readily dissembled or reassembled with simple tools and does not require any heavy machinery. This feature also lends itself to the long-term maintenance of the pontoons as any damaged units can be readily removed and replaced.

Figure 7: Catalina Harbor & floating pontoon structural designed.

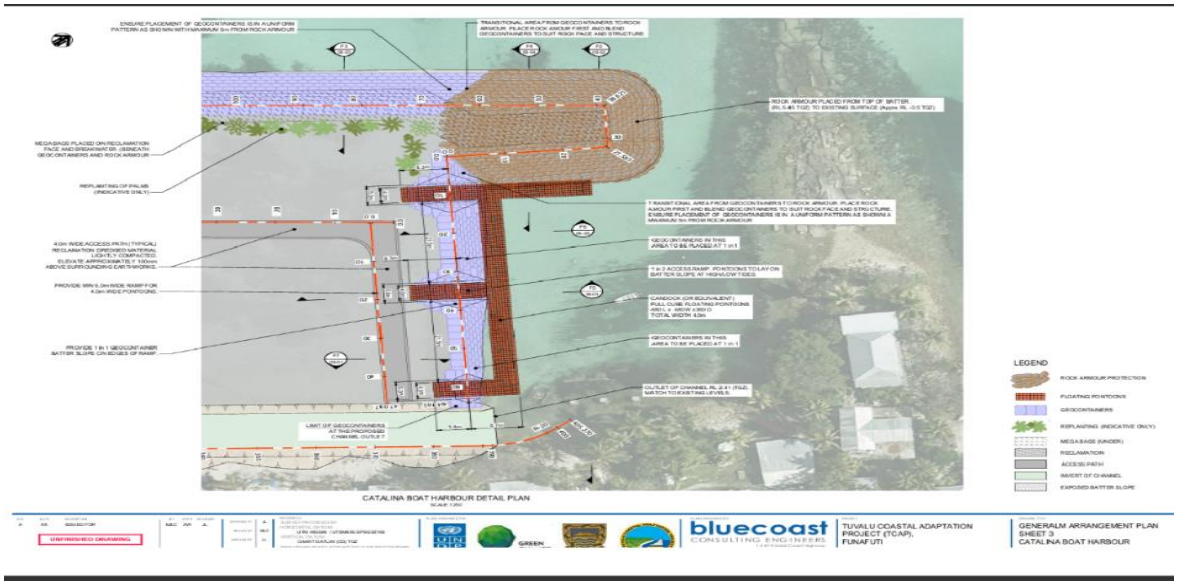
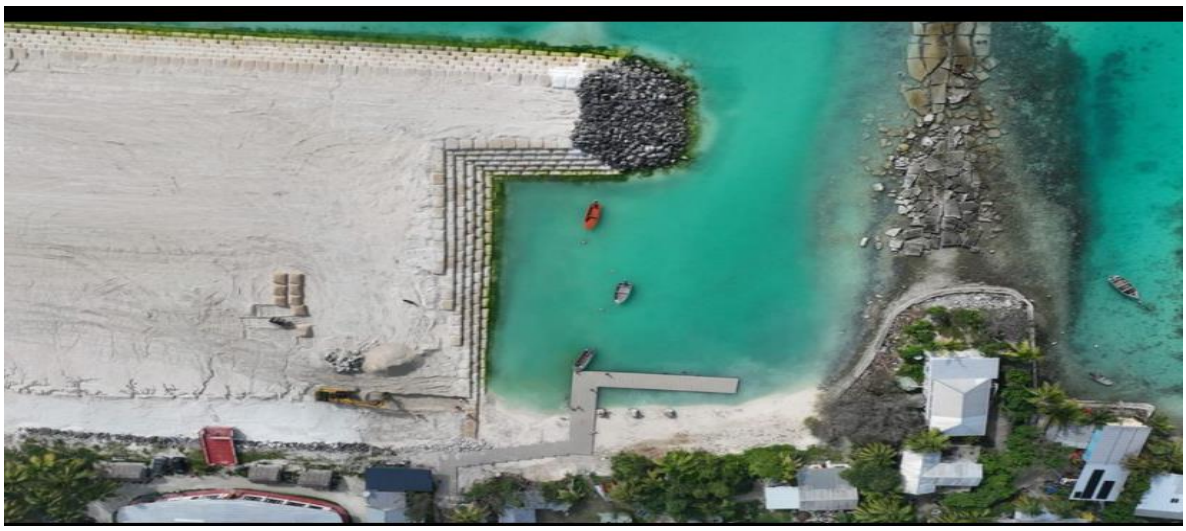



Figure 8: Catalina harbor & Floating pontoon actual structure.



Fixes during defect liability period

From the reclamation design presented in the Concept Design Report, the project adopts geosynthetic sand container (GSC) armor units. These units were originally expected to have a service life of at least 25 years. Improvements in geosynthetics mean that the units used have

a reported design life exceeding 40 years. Geosynthetics have been selected for the bund material rather than rock or steel structures (which may have a longer design life) due to the government's long-term strategy of further reclamation works (seaward of both the TCAP and QEII reclamation areas). Future burial of geotextile units will be more cost-efficient than removing and replacing rock, concrete units or sheet piles.

We observed that during the defect liability period of one year, the contractor did some maintenance to some of the GSC units in several areas of the reclaimed land. A small number of units that had been misplaced or damaged were replaced with new ones. Figure 9 is a picture taken by the auditors when the contractor was working on replacing some of the GSC units. TCAP PMU clarify that this repair was due to a construction fault with the underlying geotextile layer causing small voids at the crest of the structure. These bags were removed so that the underlying layer could be correctly placed. The bags were checked for damage during removal and then replaced.

It is important that the GSC units are regularly inspected and maintained by who is responsible for maintaining them to ensure that they provide protection from wave action over time.

Figure 9. Geosynthetic sand containers being replaced with new ones by the HALL company.


<u>Unexpected disadvantages for some households near the reclaimed land</u>

In the structural plan, the reclaimed land slopes down towards the drainage that lies between the mainland and the reclaimed land. There are rills (erosion features) at the edges of the drainage, as shown in Figures 10 & 11, caused by heavy rain. The pictures show only parts of

the reclaimed land drainage, but most of the drainage along the reclaimed land has similar rills. Drainage works have occurred to alleviate the concern of neighboring properties of flooding from the reclaimed land into the village. Vegetation of the land and building on it are also expected to reduce the occurrence of rills. According to TCAP PMU the initial design and intent of the reclaimed land was to provide a low-maintenance structure, aimed to meet sea level rise and wave inundation threats and this is why a sloped structure was suggested and approved. Once building atop the reclamation has begun, drainage will subsequently change, howve4r the underlying structure will be one that drains to the swale. The QEII reclamation is an example of what will occur if drainage is not considered. The entire surface is riddled with potholes, puddles and mud after even a day of rain.

Figure 10. Funafuti reclaimed land drainage (auditors)

Figure 11. Rills caused by heavy rain (auditors)

From our interviews of households who live along the coastal area adjacent to the reclaimed land, one household complained about the road access to the reclaimed land outside their house. Due to the number of vehicles going in and out of the reclaimed land, big potholes had been created where water got trapped during heavy rain causing flooding near their home (see Figure 12). In the design structural plan, this area is the main road access to the reclaimed land. The potholes therefore need to be fixed and the road properly maintained. During the period of the audit, we witnessed the continuous maintenance to this road; however, the issue kept recurring during periods of heavy rain, as the potholes would quickly re-form, trapping water and causing repeated flooding near the household's property.

Figure 12. Flooding outside homes adjacent to the main access road to the recliamed land, caused by potholes filling with rain water during heavy rain (auditors)

## 5.2 Dealing with changes to the project timeline and costs.

There was a delay in construction of the reclaimed land caused by the Covid 19 pandemic. The delay was for 15 weeks and was mainly due to the government of Tuvalu travel restrictions and quarantine requirements from June to September 2022. The only airline that serves Tuvalu is Fiji Airways. When Fiji recorded their first case of Covid 19, the Tuvalu Government declared a state of emergency, closed Tuvalu borders to commercial flights and placed quarantine requirements on non-commercial flights of 21 days.

The TCAP PMU raised the issue of the delay and the additional cost that would be incurred at the 8th TCAP Board meeting on 25th August 2022. The total additional cost to the project was approximately AUD$2 million, including lost time, inflation, increased labor costs, extended rental agreements for equipment, and other related project expenses. The Board considered re-allocating funds from other objectives to cover the additional costs. However, it was decided that the UNDP and the Government of Tuvalu should approach the Green Climate Fund (GCF) or any other donors to discuss the possibility of securing additional funding. In parallel, the

TCAP team and the Government of Tuvalu also approached the Australian Government, through the Department of Foreign Affairs and Trade (DFAT), to seek financial support. Following discussions, DFAT agreed to provide funding to cover the AUD$2 million shortfall, enabling the project to proceed without compromising its core objectives.

Delays like this can erode stakeholder trust and confidence and affect future funding opportunities and community support for projects. In this case, the situation causing the delay was difficult to predict and high impact.

### 5.3 Conclusions on building of the reclaimed land to plan

Overall, the reclaimed plan was mostly built to plan, with one agreed change to mainly accommodate the needs of local people. The contactor made some fixes to the GSC units during the defect liability period, and there have been unexpected disadvantages for some households near the reclaimed land associated with drainage problems along the reclaimed land and flooding of the main access road. Fixing the drainage and access road are crucial to ensuring the safety and satisfaction of the local community. Continuous monitoring and maintenance will also be necessary to ensure the long-term success and sustainability of the reclaimed land and associated structures.

The delays and additional costs caused by the Covid 19 pandemic are a timely reminder of the need for planning of major projects such as the reclamation of the land to consider worst case scenarios and include some contingencies for these scenarios in contracts and funding agreements to mitigate their effects, where possible.

### 5.4 Audit Recommendations

We recommend that the MHACCE through the Climate Change Department and TCAP to work with the PWD:

- to conducts a thorough assessment of the state of drainage along the reclaimed land to identify the extent of erosion and associated drainage problems and implements corrective measures.
- conducts a thorough assessment of the state of the main access road to identify the extent of structural concerns and associated flooding problems and implements corrective measures.
- puts in place a regular inspection and funded maintenance programme for the GSC units, drainage, access road and other infrastructure along the reclaimed land to ensure that they provide effective mitigation of the impacts of wave action over time.
- maintains regular and open communication with households living alongside the reclaimed land to identify and resolve problems affecting them associated with maintenance of the reclaimed land quickly and effectively, wherever possible.

We recommend that the TCAP PMU reviews the risk management plans for other ongoing TCAP projects to ensure that they cover all plausible worst-case scenarios and include practical mitigation actions for these scenarios to reduce their impact on timely, cost-effective project completion, wherever possible.

TCAP, CCD and PWD Management – Agree or Disagree and Comments

Safeguards: agree with recommendations, noting that promotion of the land use plan and installation of primary infrastructure (roads, drains, landscaping) should commence as soon as possible as the final shape of the reclamation margins and the drainage discharge points are tied to the developed surface layout and shape of the reclamation.

Drainage erosion is at small scale and will be addressed through plant cover, rehabilitation work where needed by the Project and more importantly restricting access to the of heavy machinery/vehicles to the reclaimed land and movement through designated paths. The drainage should be looked broadly looking at future proposed developments and also improving the drainage of the village behind the reclaimed land.

An Operations and Maintenance Manual has been produced and a training session held with the PWD

# 6.0 THE BENEFITS OF THE RECLAIMED LAND

In this part of the report, we examine whether:

- mechanisms are in place to monitor the performance of the reclaimed land; and
- the anticipated benefits of the reclaimed land are being realized.

## 6.1 Monitoring the performance of the reclaimed land.

The reclaimed land presents significant opportunities for urban development, environmental restoration, and economic growth. Responsibilities and mechanisms for ensuring that the land is well managed and maintained, and the intended benefits are achieved, need to be clear.

The Public Works Department (PWD) is currently responsible for maintenance of the reclaimed land. However, the future ownership of the land is uncertain, with discussions ongoing regarding whether it will remain under government control or be transferred to local councils.

If the government retains ownership, the PWD will continue to oversee monitoring and maintenance, ensuring that appropriate measures are taken to sustain the land's ecological and economic viability. Should the land be transferred to local councils, the responsibility for monitoring and maintenance will shift, necessitating a clear framework for local governance.

Whoever is responsible, PWD or local councils, effective management and maintenance of the land is essential to ensure its sustainable use, and effective reporting on how well the intended benefits are being achieved is needed, to provide accountability and transparency, and ensure the potential of the land is realized for the people of Funafuti and Tuvalu.

Monitoring is crucial to maintaining the ecological health of the land and ensuring that it can support the intended uses, such as agriculture, recreation, or development. Effective monitoring can help identify potential problems early, such as erosion, pollution, or invasive species, and enable early intervention to mitigate risks and reduce land degradation. It also

helps to ensure compliance with environmental regulations and standards, and legal requirements, thereby avoiding potential fines and legal challenges.

Clear performance indicators are needed to evaluate the success of the reclamation process, ensure accountability among stakeholders, and provide transparency for the community. Metrics such as land usage rates, economic returns, and community satisfaction can inform future decision-making and adjustments to land management strategies.

Involving the community in monitoring efforts and decision-making will foster trust, enhance local stewardship, encourage responsible management practices, and help ensure that the land meets the needs and expectations of its users.

### 6.2 Benefits and concerns from the reclaimed land

The purpose of the coastal land reclamation initiative was to mitigate erosion caused by wave action and to create additional land for construction and other activities. It is important for the MHACCE, through the Climate Change Department and TCAP, to work closely with the Public Works Department (PWD) to implement a long-term monitoring program—assessing the effectiveness of the reclaimed land in reducing erosion, its impact on the local ecosystem, and the extent of benefits being realized.

There was also a high number of local workers that have been involved in the TCAP project. The Hall company have employed and trained many local workers, in fact the majority of the construction crew. Training has included workers obtaining internationally recognised construction safety certification (White Cards). At this stage, auditors have already observed and witness some early positive outcomes

A survey conducted during the audit by auditors among residents living along the coastline indicated overwhelming support for the initiative. All respondents expressed gratitude for the reclamation efforts, citing improved coastal stability and increased property security and extra space for more activities. The initiative has had a positive impact on livelihoods and local ecosystems, encouraging locals to plant trees and have their own garden, as there is more protection from wave action. We also witnessed local citizens using the reclaimed land as a place for morning and evening walks, fishing and swimming, sports and other social activities.

We also found that the reclaimed land was being used for other purposes such as to temporarily store almost 400 containers, as shown in Figure 13. These containers were moved from wharf which helped in wharf rehabilitation as there was no other storage place on the island.

According to TCAP, the reclaimed land was proven effective in acting as a buffer by absorbing wave energy and reducing the impact of king tides on vulnerable coastal areas as experience in 2024.

Figure 13. Containers at the reclaimed land (auditors)


While most of the people we interviewed who live along the coastal area adjacent to the reclaimed land provided positive feedback, some expressed concerns and raised questions that they said needed to be addressed. We found that some of these concerns were raised during the Funafuti ESIA consultation report. The questions and concerns raised during our survey emphasize the need for a proper assessment of the effectiveness of the reclaimed land in preventing erosion and its impact on the local ecosystem. They were:

1. Has the reclaimed land had any environmental or physical impact on other parts of the main island or nearby islets?
2. Is the construction of the reclaimed land contributing to the accelerated coastal erosion observed on some of the smaller islets?
3. Is the presence of the reclaimed land influencing the increased flooding in low-lying areas during high tide?

Our audit reviewed the gender equity aspects of the Tuvalu Coastal Adaptation Project (TCAP), drawing on documentation including the Interim Evaluation Report conducted by Saamu Tui.

We found that while the TCAP Project Document and Funding Proposal incorporated gender considerations to promote gender responsiveness, the Logical Framework reflected only limited gender-focused activities. Although financial resources and project activities were allocated with the intention of enabling women to benefit from the project, the scope of gender-related interventions was minimal. The project's Gender Strategy and Action Plan had also been revised to align with minimum compliance requirements, rather than expanding gender-specific outcomes beyond what was required to meet stated gender-related targets. This approach appears to have been taken to avoid creating unrealistic expectations or incorporating gender activities deemed unnecessary for achieving core project objectives.

Stakeholder feedback on gender equity results was mixed. National-level stakeholders expressed satisfaction with TCAP's efforts in promoting gender equality. In contrast, community-level female stakeholders reported that they had not yet directly benefited from the project interventions, indicating a disconnect between high-level planning and on-the-ground outcomes. At the time of the interim evaluation, the Project Management Unit (PMU) advised that it had limited capacity to implement gender initiatives beyond the minimum requirements. This lack of in-house technical capacity contributed to the limited integration of gender-focused actions within the project's operational framework. According to the current PMU, the current International Project Coordinator who joined the project in early 2024 have significant experience in gender mainstreaming and led the gender mainstreaming in the project. In addition, the International Gender and Social Development Office also joined the project in early 2025 to continue the support. Some impactful activities such as the inclusion of separate activities and budget in the Island Strategic Plans (ISPs) was done for the 1st time through support from project. They also mentioned that during the construction period, out of the 43 locals engaged, only 4 female shows their interest and were all included in the team.

The interim evaluation also observed that deliberate efforts were made to promote gender balance in project governance. For instance, the project's first manager (prior to her resignation in 2018) was a woman. However, systemic challenges, including a shortage of qualified personnel in both Tuvalu and Fiji, hindered the project's ability to consistently recruit and retain experienced staff across all functions, including gender-related roles. Despite these limitations, TCAP demonstrated a commitment to improving gender balance in its governance structures and to building the capacity of both male and female staff to support gender-responsive implementation in future project phases.

### 6.3 Conclusions on realizing the benefits from the reclaimed land

Early benefits from the reclaimed land, including to livelihoods and the local ecosystem, are being experienced. For the intended benefits of the reclaimed land to be fully realized and sustained for the people of Funafuti and Tuvalu, active long-term management of the land and realization of the intended benefits is needed, to maximize its potential. Responsibilities for ensuring that the land is well managed, the proposed land use is implemented, and the intended benefits are achieved need to be clarified, and monitoring and reporting mechanisms put in place to provide accountability and transparency, including over any unintended consequences of the reclaimed land and how they are being addressed. Community involvement will be critical to conservation and sustainable use of the land to provide ongoing benefits to them, including benefits to women.

### 6.4 Audit Recommendations

We recommend that the MHACCE through TCAP and Climate change Department:

- implements a long-term monitoring program to assess the ongoing effectiveness of the reclaimed land in preventing erosion and its impact on the local ecosystem.
- implements land use plans and a maintenance and management plan to support the ecological health of the land, prevent land degradation and ensure its sustainable use.

- regularly reports publicly on how well the intended benefits from the reclaimed land are being realized and maximized over time, and how any intended consequences are being addressed; and
- engages the community in ongoing management and maintenance of the land, including gathering feedback and suggestions for improvements, and encouraging responsible and sustainable land use practices and coastal conservation measures.

We also recommend that the government and local councils resolve as soon as possible where ownership of the land rests to provide certainty over the long-term sustainable management and maintenance of the land needed to fully realize the benefits from it.

TCAP and CCD Management – Agree or Disagree and Comments

Safeguards: The greatest gender benefits that the reclamation can provide (other than protection of existing development and the provision of a 'safe zone' in the event of a cyclone overtopping event) is through the development of facilities that benefit women (eg gardens, recreational/sports spaces, women's centres, toilets etc). The ownership/management of the new land needs to be finalised, land use plans for the reclamation confirmed and key surface works (roads, drainage, landscaping) commenced. Until this is done, drainage will remain problematic, maintenance will languish and the ultimate potential benefits of the land will not be realised.

The Operation & Maintenance manual has also been developed with an inspection strategy, asset management database and regime.

## Appendix 1 - How we undertook the audit.

The Audit was conducted using a Result Oriented Approach to assess the effectiveness of the adaptation measures.

Our audit expectations for planning reclamation of the land were that:

- there was a proper plan in place;
- there was an Environmental & Social Impact Assessment done;
- all relevant stakeholders and the marginalized groups were engaged in consultation; and
- resources were planned to be allocated and utilized effectively.

Our audit expectations for reclamation of the land were that:

- the reclaimed land was built according to the plan; and
- changes to the project timeline and costs were properly dealt with.

Our audit expectations for reclamation of the land were that:

- mechanisms are in place to monitor the performance of the reclaimed land; and
- the anticipated benefits of the reclaimed land are being realized.

We interviewed key responsible officers, directly observed construction of the reclaimed land, and analysed reports available on the TCAP website (https://tcap.tv/) and the UNDP transparency portal (https://open.undp.org/). Throughout the audit, most of the documentation and information needed was retrieved from these two sites.

We also conducted interviews with the communities on Funafuti about how their lives were affected by the reclaimed land.