

Annex 2F: Draft Outline Terms of Reference for Activity 1.2.1 – Living Shoreline Design and Construction and Indicative List of Possible Service Providers

Fiji Coastal Reef Resilience (CRR) Project

Design and Engineering Consultants to Design and Implement Living Shorelines in Fiji

1. Fiji CRR Project Overview

The Fiji Coral Reef Resilience Project is an initiative of the Government of Fiji supported by the Green Climate Fund (GCF) and implemented in partnership with the Worldwide Fund for Nature (WWF) and national stakeholders. The project aims to strengthen climate resilience in coastal and watershed systems associated with the Great Sea Reef by investing in Nature-based Solutions (NbS) and Ecosystem-based Adaptation (EbA) measures that reduce climate risks while supporting ecosystem health and sustainable livelihoods.

The project will catalyze transformational change by implementing ecosystem restoration and coastal resilience interventions across the four provinces adjacent to the Great Sea Reef—Ba Province, Ra Province, Bua Province, and Macuata Province. These interventions include the restoration of degraded mangrove and riparian ecosystems along waterways connected to the reef, alongside the establishment of approximately 12 km of living shoreline interventions to reduce coastal flooding risks and strengthen shoreline stability for vulnerable communities.

In addition to ecosystem restoration and coastal resilience measures, the project will support the long-term conservation and sustainable management of the Great Sea Reef through the development of a management plan. Complementary activities will strengthen community-based fisheries management, support locally driven conservation initiatives, and promote reef-positive livelihoods and enterprises, contributing to improved ecosystem health and enhanced resilience for communities connected to the Great Sea Reef.

2. Background and Context

Under Output 1.2 of the Fiji Coral Reef Resilience Project, living shoreline interventions will be implemented to reduce coastal flooding and increase the resilience of communities along Fiji's Great Sea Reef (GSR). These interventions complement ecosystem-based adaptation (EbA) measures under Output 1.1 by providing nature-based coastal protection against storm surge, coastal erosion, and flooding caused by extreme climate events.

A living shoreline is a nature-based method for stabilizing coastlines using natural materials such as native vegetation, mangroves, sand, and rock. Unlike conventional “hard” infrastructure such as concrete seawalls, living shorelines maintain natural coastal processes while providing

protection against erosion and wave energy. These approaches can reduce wave height through attenuation, encourage wave breaking before reaching the coastline, slow water flows, and promote sediment deposition, thereby stabilizing shorelines over time.

The selection of living shoreline interventions is based on findings from the project's feasibility studies (Annex 2), which identified them as context-appropriate solution for Fiji's coastal environments. The approach also aligns with national coastal resilience planning efforts being supported by partners such as the World Bank, Asian Development Bank, and International Finance Corporation, which are assisting the Government of Fiji in developing a national seawall financing and implementation strategy. While those initiatives focus on other provinces, the Fiji Coral Reef Resilience Project will target coastal communities within the GSR region that currently have limited protection from coastal flooding and storm surge.

Through the implementation of approximately 12 km of living shoreline interventions, the project will help reduce flood exposure across approximately 1,500 hectares of land. These interventions are expected to benefit around 117,871 people, including 35,341 direct beneficiaries and 82,530 indirect beneficiaries.

Community participation is central to the design and implementation of these interventions. The project will engage Indigenous Peoples and Local Communities (IPLCs), civil society organizations, and local stakeholders through surveys, focus groups, and training activities. These engagements will support the co-identification of coastal challenges, co-design of nature-based solutions, and community-based monitoring of project activities, ensuring that living shoreline interventions reflect local priorities and contribute to long-term resilience.

Table 1: Living shoreline details by province

Province	Length (km)	Flooding reduction (ha)	Direct Beneficiaries	Indirect Beneficiaries
Ba	3.29	995	24,014	51,048
Ra	0.57	39	1,913	6,913
Bua	1.46	65	725	1,634
Macuata	6.67	446	8,689	22,935
Total	12	1,545	35,341	82,530

3. Objectives of the Assignment

The objective of this assignment is to engage qualified engineering and design consultants to support the planning, design, implementation oversight, and defining required operation and maintenance requirements, as well as monitoring frameworks of the living shoreline interventions to ensure their proper functioning across all identified sites in Fiji.

Specific objectives include:

1. Conduct technical assessments to validate baselines conditions and finalize intervention sites identified in the feasibility study.
2. Develop engineering and landscape designs for living shoreline interventions using nature-based approaches (as shown in the Annex) and validate performance targets.
3. Integrate ecological restoration and coastal protection measures, as appropriate.
4. Lead procurement preparation and undertake construction oversight.
5. Develop monitoring frameworks and long-term operations and maintenance strategies.

4. Scope of Work

The consulting firm will undertake the following high-level tasks:

Task 1: Pre-Design Screening and Site Validation

1. Conduct reconnaissance surveys and technical site validation.
2. Assess shoreline conditions, slope, sediment dynamics, hydrology, and ecological features.
3. Conduct baseline environmental, climate, and socio-economic assessments.
4. Map existing infrastructure and land use.
5. Document baseline shoreline conditions through surveys and photographic documentation.

Task 2: Site Assessment and Feasibility Analysis: Site selection should consider shoreline characteristics, including slope and exposure to coastal processes, as well as the suitability of surrounding land uses such as cropland, grasslands, mangroves, shrublands, and forested areas. Sites should support native vegetation planting and ecological restoration, demonstrate potential flood reduction benefits based on flood modelling, and maximize coastal protection benefits for nearby communities and critical infrastructure.

1. Review and refine flood modelling outputs from the feasibility study (Annex 2).
2. Evaluate coastal geomorphology, hydrology, and sediment transport processes.
3. Assess ecological restoration opportunities including mangrove and vegetation planting.
4. Identify technically feasible living shoreline interventions (based on the reference living shorelines provided in the Annex)
5. Assess climate risks including sea-level rise and extreme events.
6. Sites should be assessed based on proximity to populated areas, and community agreement or consent. Selected locations should also be compatible with surrounding land uses and avoid conflicts with industrial infrastructure, tourism developments, or mining activities.

Task 3: Engineering Design and Planning

1. Develop conceptual and detailed designs for each segment of the living shoreline interventions.

2. Prepare technical drawings, design specifications, and construction guidelines.
 - a. Develop GIS maps and geospatial datasets of intervention sites.
 - b. Prepare spatial documentation of shoreline conditions and interventions.
3. Develop a geospatial database to support monitoring and future use.
4. Integrate ecological restoration components such as mangrove restoration and native vegetation planting.
5. Prepare Bills of Quantities (BoQs) and technical specifications for construction.
 - a. The materials will be sourced and procured locally to ensure the designs are rooted in local realities and material usage.
6. Prepare bidding documents and procurement packages for civil works contractors.

Task 4: Environmental and Social Safeguards

1. Work closely with the ESS Officer within the PMU to complete the ESS Screening associated with the relevant project Outputs.
2. Advise PMU on environmental or social risks related to planned living shoreline interventions.
3. Provide feedback to ESS Officer within PMU on appropriate mitigation measures to ensure any Safeguards risks are eliminated or effectively managed.
4. Ensure that identified ESS mitigation measures are incorporated into implementation of living shoreline activities.

Task 5: Implementation Support and Construction Supervision

1. Provide technical oversight during construction of living shoreline interventions.
2. Ensure compliance with engineering designs, environmental safeguards, and relevant Fijian regulations.
3. Conduct site inspections and quality assurance monitoring.
4. Provide technical guidance to contractors and implementing partners.

Task 6: Monitoring, Evaluation, and Adaptive Management

1. Develop monitoring frameworks for long-term shoreline performance and ecological recovery.
2. Validate and offer recommendations for additional indicators related to flood protection, shoreline stability, and ecosystem restoration.
3. Conduct periodic monitoring during the implementation period and provide recommendations for adaptive management after the project period.

Task 7: Operations and Maintenance Planning

1. Develop long-term operations and maintenance plans for living shoreline interventions.
2. Identify maintenance requirements including vegetation management, sediment monitoring, and structural stability.
 - This should include community led M&E of the interventions per output 2.1.3,
3. Provide guidance for provincial government and community-based maintenance mechanisms.

5. Exclusion list

To prioritize EbA, the following approaches will not be considered eligible for the project:

1. Hard shoreline armoring structures (e.g., concrete seawalls, bulkheads)
2. Groins
3. Offshore breakwaters
4. Barriers that sever natural land-water connections
5. Mechanical beach scraping or sand removal

6. Standards and Compliance

Consultants shall:

1. Adhere to internationally recognized coastal engineering standards.
2. Follow best practices for ecosystem-based adaptation and nature-based coastal protection as per [IUCN's NbS Standard](#).
3. Ensure compliance with relevant national regulations in Fiji.
4. Integrate climate resilience and sustainability principles in all designs.
5. Ensure environmental and social safeguards are implemented during project execution.

7. Indicative deliverables may include:

Deliverable	Description
Inception Report	Outlines the consultant's approach, methodology, workplan, and timeline for delivering the assignment.
Site Screening and Validation Report	Identifies and confirms suitable sites for living shoreline interventions based on agreed selection criteria and as noted in the feasibility study of the FP's Annex 2
Site Assessment and Feasibility Report	Provides analysis of site conditions, risks, and technical feasibility of proposed interventions.
Engineering Designs and BoQs	Includes conceptual and detailed designs, technical specifications, and Bills of Quantities for implementation.
GIS Maps and Spatial Data	Maps and geospatial database of intervention sites and associated design information.
Environmental and Social Safeguards Documentation	Environmental and social management documentation prepared as required by project safeguards team.

Deliverable	Description
Construction Supervision Reports	Periodic reports documenting implementation progress and technical oversight during construction.
Monitoring and Evaluation Framework	Framework for monitoring performance and outcomes of living shoreline interventions.
Operations and Maintenance Plan	Guidance for the long-term management and upkeep of the interventions.
Final Completion Report	Summary of implementation outcomes, lessons learned, and recommendations for future replication.

8. Duration of Assignment

The duration of the assignment will be aligned with project implementation phases of the overall project and its annual targets. The overall duration may extend across multiple years depending on implementation timelines and should be clearly defined using a Gantt chart and agreed upon with the AE and the PMU.

9. Qualifications of the Consulting Firm

The consulting firm or consortium should demonstrate:

1. Proven experience in coastal engineering and shoreline stabilization.
2. Experience designing nature-based solutions and ecosystem-based coastal protection measures.
3. Expertise in coastal geomorphology, hydrology, and climate adaptation.
4. Experience working in coastal or island environments, particularly in Small Island Developing States.
5. Demonstrated ability to integrate engineering design with ecological restoration.
6. Experience working with local communities and multi-stakeholder environments.

The consulting team should include expertise in:

1. Coastal engineering
2. Landscape design
3. Marine ecology or coastal ecology
4. Hydrology and climate risk modelling
5. Environmental and social safeguards
6. GIS and spatial analysis
7. Community engagement and participatory planning.

Annex

Types of living shorelines within the scope of the project



Figure 1: Natural and Structural Measures for Shoreline Stabilization. Source:
<https://coast.noaa.gov/digitalcoast/training/living-shorelines.html> and
<https://www.delawarelivingshorelines.org/what-is-a-living-shoreline>



Figure 2: Natural and Structural Measures for Shoreline Stabilization. Source: <https://coast.noaa.gov/digitalcoast/training/living-shorelines.html> and <https://www.delawarelivingshorelines.org/what-is-a-living-shoreline>

Table 2: Non-exhaustive list of design and engineering consultants

Company	Notes
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Hall Contracting (Hall Pacific) — Australia	heavily engaged across the Pacific Islands, explicitly including seawall construction, coastal protection, land reclamation, and flood-mitigation dredging in Tuvalu, Tokelau, Fiji, and Papua New Guinea.
International Coastal Management (ICM) — Australia	ICM is a specialist coastal engineering consultancy with 40+ years of global experience, 1,200+ coastal projects in 23 countries, and existing work throughout the Asia Pacific.
Pacific Development Contractors (PDC) — Papua New Guinea	PDC runs a specialist <i>Marine Works Team</i> focused on coastal and offshore structures, and is one of PNG's top engineering contractors.
McConnell Dowell — New Zealand / Australia / Pacific	McConnell Dowell has over 65 years of project delivery in the Pacific, including major wharf, port, marine, and outfall infrastructure—types of civil works closely aligned with seawall construction. They are an accomplished engineering-led contractor known for operating in remote Pacific locations, including Samoa and American Samoa. They have a <i>proven track record in delivering complex projects in the Pacific Islands</i>, including ocean outfalls and coastal infrastructure.
ENGEO (Coastal & Maritime Division) — New Zealand / Global	ENGEO specializes in geotechnical coastal engineering, including: 1. Shoreline stabilization 2. Seawall design 3. Cliff erosion control 4. Wharf & pier foundation engineering 5. Coastal hazard assessments They operate across New Zealand and the Pacific for both public and private clients. ENGEO provides services covering <i>sea-level rise, shoreline restoration, seawall design alternatives</i>, and coastal infrastructure supervision.
Carr Consultancy (Fiji)	Piling and ground stabilization for Fiji Roads Authority. Modular jetty construction for South Sea Cruises. Marina piling & pontoon installations (Denarau Marina, Fantasy Island). Heavy marine logistics, remote-site engineering, bridge piling.