



# Federated States of Micronesia – International Waters Ridge to Reef Project

Department of Environment,  
Climate Change & Emergency Management



## Final Report

December 2016 – September 2021

Prepared by: Faith A. Siba

March 2022





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# Preface

The lead agency for the GEF Pacific International Waters – Ridge to Reef (R2R) pilot project in the Federated States of Micronesia (FSM) is the Department of Environment, Climate Change and Emergency Management (DECCEM). To implement this project, a Memorandum of Agreement (MOA) was signed between DECCEM (formerly OEEM – Office of Environment and Emergency Management) and the Pacific Community (SPC) on December 28, 2016.

A project closure narrative report is specified in the MOA, and thus will be submitted to the Regional Programme Coordinator. The report provides a project summary from the signing of the MOA until September 30, 2021.

Specifically, this report presents FSM’s country pilot project results and achievements, financial summaries, implementation progress ratings, project contribution to the Regional GEF Pacific IW Ridge to Reef Project Framework, contribution to not just GEF Focal Areas but to the Sustainable Development Goals (SDGs) and other special themes.



**Honourable Andrew R. Yatilamn**

Department of Environment, Climate Change and Emergency Management

# Acronyms

CBOs	Community-Based Organizations
DECEM	Dept. of Environment, Climate Change & Emergency Management
DLP	Dry-Litter Piggery
FSM	Federated States of Micronesia
GBF	Green-Belt Farming
GEF	Global Environmental Facility
GEM	Geoscience, Energy and Maritime Division
IW	International Waters
IWRM	Integrated Water Resource Management
KCSO	Kosrae Conservation & Safety Organization
KIRMA	Kosrae Island Resources Management Authority
KSG	Kosrae State Government
K-TAC	Kosrae Technical Advisory Committee
LRMC	Lelu Resource Management Committee
LTG	Lelu Town Government
M&E	Monitoring and Evaluation
MYCWP	Multi-Year Costed Workplan
NGOs	Non-Governmental Organizations
R2R	Ridge to Reef
RPCU	Regional Programme Coordination Unit
SIDS	Small Island Developing State
SPC	The Pacific Community
TAC	Technical Advisory Committee
UNDP	United Nations Development Programme
UNE	United Nations Environment
WFP	Work and Financial Plan

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# Basic Project Data

Table 1: FSM IW R2R Project Data

<b>Project Title</b>	Ridge-to-Reef: Testing the Integration of Water, Land, Forest & Coastal Management to Preserve Ecosystem Services, Store Carbon, Improve Climate Resilience and Sustain Livelihoods in Pacific Island Countries
<b>Project Site/ Location</b>	Federated States of Micronesia/ Tofol – Mutunnenena Area, Kosrae State
<b>Project Objectives</b>	R2R pilot projects are designed to strengthen R2R integration by establishing synergies among the work of the various sector agencies between governments and communities, and civil society and the private sector within the nation. FSM IW R2R project is designed to guide the integration of water, land, forest and coastal management required to fashion sustainable futures for the island community.

<b>Contract Information</b>	Contract number	MoA signed December 28, 2016
	Original Project Duration	December 31 <sup>st</sup> 2019
	Contract Extension (if applicable)	September 30 <sup>th</sup> 2021
	Contracting Party	Department of Environment, Climate Change & Emergency Management (DECEM) formerly OEEM.
	Contracting Party Signatory	Andrew Yatilman
	Contract Amount (SPC-R2R)	\$200,000.00 USD
	Counterpart (Agency, Department)	USD 80,000
	Counterpart of other partners (e.g. development partners, NGOs, CSO, Academic, etc.)	USD 101,600

A co-financing in the amount of USD 560,474 was planned (refer to the letter of commitment). Actual co-financing mobilized is indicated in the table below as USD 181,600.



# Executive Summary

This Final Narrative – Project Closure report provides a snapshot of the GEF International Waters funded Pacific Ridge to Reef Project - FSM's National IW R2R demonstration project - capturing the summary of the status and achievements of the project since the signing of the MOA with SPC in December 2016 through September 2021.

The objective of this project is to test the mainstreaming of 'ridge-to-reef' (R2R), climate resilient approaches to integrated land, water, forest, and coastal management in the PICs through strategic planning, capacity building and piloted local actions to sustain livelihoods and preserve ecosystem services. FSM's IW R2R national demonstration project envisions to (1) demonstrate innovative approaches to Integrated Ridge to Reef Catchment Management in Kosrae, FSM, (2) establish a Kosrae State Freshwater Resources Management Plan, and (3) build Kosrae State and local capacity for Integrated Ridge to Reef Catchment Management to enable best practice in coastal waters, land and public health protection

Project planned inputs through making funds available to support project implementation were satisfactory. However, technical inputs were not all supplied as indicated in the project document or as planned. Examples below: -

- i. Technical support and capacity enhancement in water sampling and water quality testing under Component 2;
- ii. Consultancy commissioned to deliver on several outputs under national component 2. The FSM pilot project faced difficulty with procuring out-of-state consultants but later procured local consultants.
- iii. Unfortunately, a lead local consultant walked off the job and there were relatively poor inputs by two local consultants. This has resulted in unused and un-utilized project funds initially transferred to carry out agreed project works and consultancies.

Another major hindrance to successful and timely delivery was the availability of materials to construct demonstration projects and the capacity on-island to procure for consultant work.

The FSM IWR2R project delivered approximately 80% of its outputs, with two (2) out of twelve (12) outputs not completed. Therefore, a self-assessment rating of this project is moderately satisfactory, having delivered the project's three (3) outcomes and goals. However, as seen in other projects, it takes time to experience an impact on behavioural change and improvement of degraded habitats, resources, and the general environment due to pollution contributed by land-based activities. Moreover, there was limited time and capacity to establish and monitor key parameters (science, socio-economic, traditional) demonstrating the long-term effects to the public.

The FSM revised environmental stress reduction target is 200ha catchment protection using improved catchment measures. A self-assessment of the project progress and completing outputs and activities suggest that the IWR2R intervention is likely to impact 160ha catchment protection. It is also agreed to stretch the focus to cover both Tofol and the Mutunnenea catchments.

Furthermore, the project generates several key lessons learned and experiences important for future R2R investments and ICM planning. Improved partnerships are considered important to allow more capacity enhancing activities from relevant partnering agencies or organizations on-island. This experience provides insight as well as lessons on how to improve better delivery of outputs. Utilizing partnerships and collaborative activities to engage local farmers in capacity enhancing training proves to be better in pilot projects like the FSM-IW R2R Project. Flexibility to revising strategies like the project multi-year-costed-workplan (MYCWP) and the results framework due to changing circumstances impacting implementation, for example, the COVID-19 pandemic. Other equally important lessons are on the programmatic approach supporting streamlined processes and joint STAR and IW project steering committee.

Regarding project finance, an amount of US\$200,000 is the allocation of all participating countries, and for FSM, it is stipulated in the MOA between SPC and DECEM. As of September 2021, a total of \$176,846.00 was advanced from SPC to FSM. Of the amount advanced, about \$142,833.17 was spent. The utilization rate is 80.8%. Some materialized co-financing partners were from the Kosrae Conservation & Safety Organization (KCSO), totaling at least \$11,600 for office space and rental maintenance and other miscellaneous expenses. KCSO and DECEM staff time contributed if monetized would be approximately \$90,000 and \$80,000 respectively.



# Introduction

The integration of freshwater watershed management with coastal area management is considered essential to foster effective cross-sectoral coordination in the planning and management of land, water and coastal uses. In Pacific Small Island Developing States (SIDS), such approaches have been termed 'Ridge to Reef' to emphasize the inter-connections between the natural resources and the social systems, from volcanic islands' mountain 'ridges', through coastal watersheds and habitats, and across coastal lagoons, to the fringing 'reefs' as associated with most Pacific SIDS. Inherent in the approach is the philosophy of cross-sectoral coordination in the planning and management of freshwater use, sanitation, wastewater treatment and pollution control, sustainable land use and forestry practices, balancing coastal livelihoods and biodiversity, conservation, and hazard risk reduction, and climate variability and change.

The Federated States of Micronesia (FSM) consists of four major island groups with over 6000 islands in the northern Pacific. Geographically, these islands vary – from high mountainous islands to low lying coral atolls and volcanic outcroppings. The four main islands have coastal mangrove fringes, and the natural vegetative cover is dense and has not generally been disrupted for intensive agricultural use.

Kosrae's Coastal Environment provided its best and most effective defense against climate-related hazards. The preservation of catchments in the upland areas is vital to the maintenance of quality surface and groundwater inflows to the coastal areas. Similarly, the maintenance of a quality coastal environment offers improved sustainability for lagoonal and reef resources, vital to food security.

The FSM IW R2R project demonstration site is in Lelu located in Kosrae State, and it contains one mangrove channel flowing directly through the Awane Marine Protected Area. There are three rivers that are found on the demonstration site, and they include the Tofol, Srungansralu and Innem Rivers. The three rivers receive rainfall from the Mahkontowe Conservation Area, and they drain large amounts of freshwater into the Lelu Bay. The land-sea connectivity covering the overall upstream and downstream stretch of Tofol Watershed provides the basis for collecting and understanding important ecosystem goods and services in the watershed and uses the baselines to better identify and implement priority management measures.

In the FSM, and certainly throughout the island of Kosrae, water pollution and contamination pose a great health risk to local populations. Piggeries are major contributors of nutrient release to water bodies, which flow downstream from highlands and elevated mountain ridges to lower coastal and marine areas. Municipal waste along with that animal and human waste continues to dominate waterways pollution in Kosrae, the FSM and the rest of Pacific SIDS. There are several poorly constructed and maintained dumpsites throughout the FSM and the dumping of solid waste, in particular human excreta, is considered one of the foremost environmental health problems<sup>1</sup>.

The FSM IW R2R Project in Kosrae, in collaboration with the FSM R2R STAR Project (STAR), the Kosrae Conservation and Safety Organization (KCSO), the Kosrae Island Resources Management Authority (KIRMA), the Lelu Town Government and the community members of Lelu Municipality, initially planned to address the issue of water quality of Mutunnenea Channel through a joint effort to reduce the nutrient load released into the water. It was agreed to convert regular existing piggeries along the banks of the Mutunnenea Channel. The site was predetermined, but the project will serve as a demonstration, a pilot site, as well a baseline for future such endeavours.

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<sup>1</sup> <https://www.pacific-r2r.org/sites/default/files/2020-07/workshop-summary-report-18-21.pdf>

# Situational Analysis, Project issues and Needs

The FSM International Waters (IW) – Ridge to Reef project held its project inception on February 21-22, 2018, in Tofol, Kosrae FSM. Some of the main presentations in the Inception were about the Pacific Regional R2R Program, the National FSM STAR project and of course the FSM IW R2R project.

One of the main highlights that resonated in all three main presentations was the “programmatic approach”. This programmatic approach, as emphasized, should not only be between the Regional IW Ridge to Reef Project and the FSM IW Ridge to Reef Project but also include the National STAR R2R project. It is then agreed upon that project managers and partnering implementing agencies use the programmatic approach from planning to implementation and capacity building. Along the same lines, it was determined then that both National projects would share the same national steering committee.

The original project pilot site was the Tofol Watershed Area. However, upon review of the area, the National Project Manager and the National Executing Agency, Kosrae Conservation & Safety Organization (KCSO) Executive Director proposed to stretch out further – from the Tofol area to the Mutunnenea area. There were two main reasons for the said proposal – the area coverage and the area’s zoning/use. One of the project’s aims was to have at least 200 ha under improved catchment management in Kosrae, FSM, however, the Tofol Watershed Area would only be a minuscule fraction of the sought 200 ha aim. The Tofol Area of Kosrae is also zoned as Government/Public land. Little to no community sense of ownership was anticipated. Stretching the project area to more residential and family-owned properties ensured communities’ involvement, participation, and sense of ownership of the project.

Moreover, there are limited areas in Kosrae State with proper sewerage systems, and large numbers of households still have pit latrines or other unhygienic excreta disposal systems. Combined with frequent rainfall events, this can lead to contaminants entering the coastal ecosystems as well as being a critical public health threat. Considerable attention is required for planned drainage in the developed areas to protect the road pavement and foothill areas from land erosion and flooding<sup>2</sup>.

The IWR2R demonstration project planned to convert existing regular wash-down piggeries into piggeries that will be operated using the Dry-Litter Technology (DLT) system, eliminating the effluent to both land and water, eliminating the strong odour from pig pens, and producing fertilisers that farmers could use or sell to other farmers. Unfortunately, the COVID-19 restricting movements of people and cargoes by air and sea did not allow materials supplied from outside to get into Kosrae to allow construction of DLT units. Plans to conduct water quality assessments were also cancelled. Nonetheless, outreach and awareness-raising activities continue without demonstrative DLT units. It is uncertain if there was a change of behaviour and attitudes to transition from wash-down piggeries to the use of DLT that does not use water and stores waste in septic tanks.

Consequently, ridge to reef policy reforms and mainstreaming integrated innovative approaches across sectors as part of national sustainable development planning offer complementary alternatives to fix the above problems. The development, testing and scaling up successful integrated approaches to water resource and coastal management in Kosrae and the whole country provide examples of specific results achieved and lessons learned in integrated approaches to environmental and natural resource management.

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<sup>2</sup> <https://www.pacific-r2r.org/sites/default/files/2020-03/FSM.pdf>

# Project Scope, components and anticipated results

Through the inception workshop, and with the guide of the pre-set national project logframe, stakeholders and project managers identified project outputs. Some of the outputs identified by stakeholders had to be disregarded, or modified to fit project specifications. But all in all, the final identified outputs are in line with the three pre-set project components.

Table 2 below summarizes the key components, the identified expected outputs, and anticipated outcomes.

**Table 2: FSM IW R2R Project Results Logframe**

Key Components	Expected Outputs	Anticipated Outcomes
Demonstration of innovative approaches to Integrated Ridge to Reef Catchment Management in Kosrae, FSM	<ul style="list-style-type: none"> <li>Sustainable land use management demonstrated through the application of upland development and agricultural best practice</li> <li>Reduction in calculated nutrient and pathogen loads</li> <li>Improve understanding of sustainable land-use practices by 30%</li> </ul>	<ul style="list-style-type: none"> <li>Improved land use operations catalysed via piloting of locally appropriate methods for uplands land use</li> <li>Environmental and public health safeguarded via targeted reductions in nutrient and pathogen contamination of surface and groundwater</li> <li>Kosrae State uptake of sustainable land use promoted through coordinated community sharing of best practices.</li> </ul>
Kosrae State Freshwater Resources Management Plan Established	<ul style="list-style-type: none"> <li>Opportunities and threats to freshwater in Kosrae identified</li> <li>Tofol Area Freshwater Management Plan developed</li> <li>Increased understanding of PM&amp;E techniques by 20%</li> </ul>	<ul style="list-style-type: none"> <li>Assessment and outlook for Kosrae's freshwater resources</li> <li>Tofol Area Freshwater Management Plan guiding Ridge to Reef catchment and community-based management of water resources</li> <li>Strengthen capacity for monitoring and evaluation of Tofol Area Freshwater resources Management Plan targets</li> </ul>
Kosrae State and local capacity for Integrated Ridge to Reef catchment management built to enable best practice in coastal waters, land and public health protection	<ul style="list-style-type: none"> <li>200 ha under improved catchment management</li> <li>Established and functional partnerships between government and local networks</li> <li>Innovative and locally appropriate materials developed for public use</li> </ul>	<ul style="list-style-type: none"> <li>Community based management for sustainable waterways established for pilot catchment</li> <li>State actors supporting community-based action for sustainable development of water, land and coasts</li> <li>Enhanced community and national level awareness of best practices for sustainable development of water, land, and coasts</li> </ul>

# Project Organization and Management

The FSM IW Ridge to Reef Project is implemented by the application of the Guiding Principles of the Ridge to Reef Approach in Pacific SIDS. The Department of Environment, Climate Change, and Emergency Management (DECEM), formerly OEEM act as the National Implementing Partner, whereas the Kosrae Conservation & Safety Organization (KCSO) is the supervising agency, responsible for FSM IW R2R Project implementation and management. The national project manager (NPM) was appointed by DECEM in consultation with the Regional Program Coordinator.

Because the project pilot site is Tofol – Mutunnenea in Kosrae, it is only appropriate that the NPM be based in Kosrae. NPM is therefore housed by the project supervising agency, KCSO. A DECEM financial officer was designated as well to support and facilitate fund management to support the NPM. The FSM IW R2R Project will share with the FSM STAR R2R Project the same inter-ministerial committee which has already been established and functional.

The Project Steering Committee (PSC) is headed by DECEM, while other members are from each of the national departments, implementing state partner from each component (STAR), and the supervising non-governmental organization for the IW project. Each of the FSM STAR project state components has its own respective Technical Advisory Committee. Be it that the National IW project is based in Kosrae, it is also overseen by the Kosrae Technical Advisory Committee.

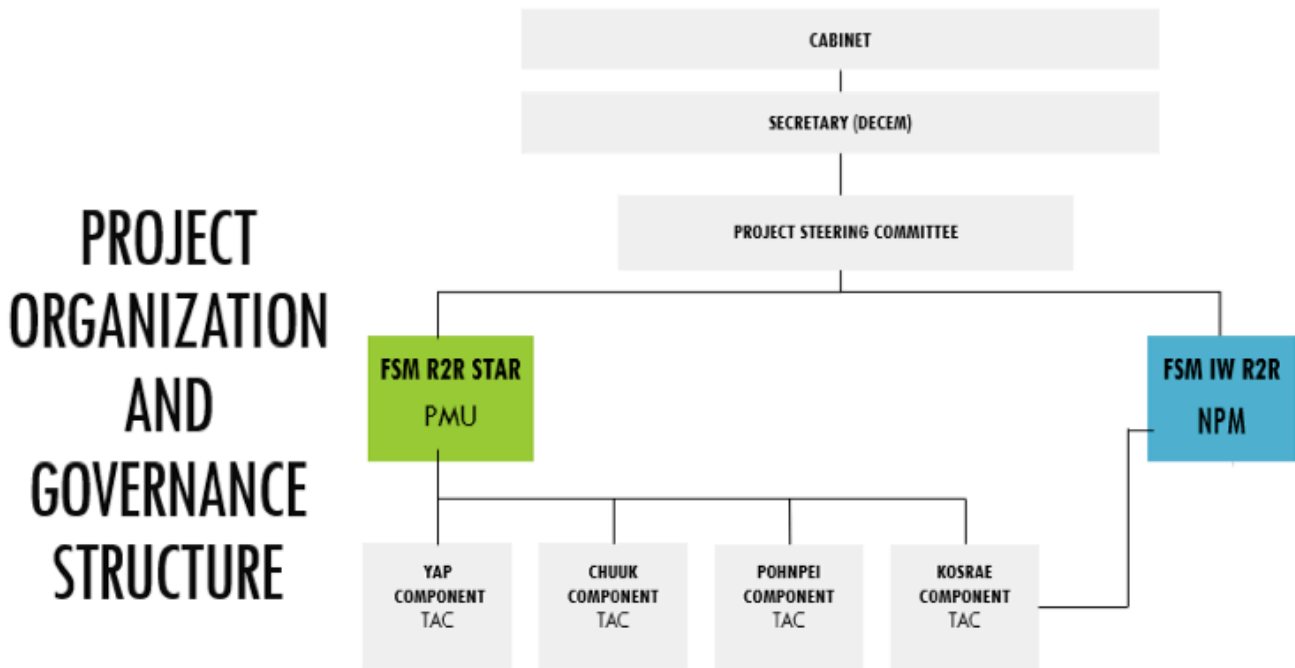


Figure 1: FSM IWR2R Project Governance Structure

# Project Stakeholders and Engagement

The project stakeholders were identified by project managers, the implementing agencies, and the Lelu Town Government (LTG), where the project site is located. The Stakeholders are the relevant government agencies, Non-Government Organizations (NGOs) and Community-Based Organizations (CBOs), project partners, and of course, the beneficiaries.

Involving the Lelu Town Government in identifying stakeholders ensured future project collaborations and also instilled a sense of responsibility and ownership of the project and its activities. LTG is also most familiar with the Lelu population, and thus knew who among the community would be most influential, collaborative, and willing to participate in the project and its activities.

Throughout the project inception workshop, SPC's Gender Adviser encouraged and reminded participants to take into account the gender aspects when dealing and discussing each detailed activity. In the said Inception Workshop, the gender adviser for SPC presented on Gender Mainstreaming and required all participants and stakeholders present to be involved to ensure the importance of Gender Mainstreaming is well communicated. With the facilitation of SPC's Gender Adviser, stakeholders came up with supporting factors, possible barriers, and identified tools and approaches for gender work. The details of priority gender issues and actions are available in the FSM Gender Action Plan (Vunisea, 2022).

Table 3 below shows the range of project stakeholders and partners agencies in the Kosrae State government and the private sector:

**Table 3: FSM IWR2R Project Partner Agencies & Organizations**

	Gov't Agencies	NGOs/ CBOs	Partners	Beneficiaries
1	Kosrae Island Resources Management Authority (KIRMA)	Micronesian Conservation Trust (MCT)	Kosrae Conservation & Safety Organization (KCSO)	IL Hamlet
2	Department of Resources and Economic Affairs (DREA)	Civil Society of Kosrae (CSOK)	FSM National Dept. of Environment, Climate Change, and Emergency Mgt (DECEM)	Pansre Hamlet
3	Kosrae Conservation Enforcement Taskforce (KCET)	The Nature Conservancy (TNC)	GEF STAR R2R Project	
4	Environmental Health and Sanitation Office	Lelu United Women's Association (LUWA)	Lelu Town Government (LTG)	
5	Kosrae Small Business Development Centre (KSBDC)	Lelu Women Organization (LWO)	Lelu Resources Management Committee (LRMC)	
6	Kosrae Youth Development Association (KYDA)	Kosrae Women's Association (KWA)	Micronesia Red Cross Society – Kosrae Chapter	
7		Women in Farming – Kosrae (WIF-K)		

# Project Results and Achievements

Table 4 below summarize the project results and achievements.

**Table 4: FSM IWR2R Project Results**

Component/ Outcomes/ Outputs	Indicate the appropriate name of the component, the desired outputs and activities	Indicate the Status of implementation
<b>Component 1</b>	Demonstration of innovative approaches to Integrated Ridge to Reef Catchment Management in Kosrae, FSM	
Outcomes	<ul style="list-style-type: none"> <li>Improved land use operations catalysed via piloting of locally appropriate methods for uplands land use</li> <li>Environmental and public health is safeguarded via targeted reductions in nutrient and pathogen contamination of surface and groundwater</li> <li>Kosrae State uptake of sustainable land use promoted through coordinated community sharing of best practices.</li> </ul>	
Output 1.1	At least 1 sustainable farming system demonstration site was successfully established, and experiences documented	Completed
Output 1.2	At least three dry-litter piggery demonstration sites in Lelu were successfully established and experiences documented	Partially Completed. Only one out of three piggery demonstration sites were completed due to the unavailability of construction materials. Vendors were not able to have materials available by the requested dates. Otherwise, the other two would have been completed as well.
Output 1.3	Community awareness program in the target area	Completed
<b>Component 2</b>	Tofol Area Freshwater Resources Management Plan Established	
Outcomes	<ul style="list-style-type: none"> <li>- Assessment and outlook for Kosrae's freshwater resources</li> <li>- Tofol Area Freshwater Management Plan guiding Ridge to Reef catchment and community-based management of water resources</li> <li>- Strengthen capacity for monitoring and evaluation of Tofol Area Freshwater Resources Management Plan targets</li> </ul>	
Output 2.1	Baseline data and information collected, analyzed and assessed	Completed.
Output 2.2	Diagnostic analysis conducted with target communities in Tofol	Completed.
Output 2.3	Community-based management planning conducted	Completed
Output 2.4	Community-based monitoring and evaluation outreach workshops conducted	Not Completed.
Output 2.5	Community-developed PM&E plan to complement Tofol Water Resources Management Plan developed.	Not Completed.

<b>Component 3</b>	Kosrae State and local capacity for Integrated Ridge to Reef catchment management built to enable best practice in coastal waters, land and public health protection	
<i>Outcomes</i>	<ul style="list-style-type: none"> <li>- Community-based management for sustainable waterways established for pilot catchment</li> <li>- State actors supporting community-based action for sustainable development of water, land and coasts</li> <li>- Enhanced community and national level awareness of best practices for sustainable development of water, land and coasts)</li> </ul>	
Output 3.1	Lelu Resources Management Committee (RMC) utilized as community-based activities management body	Completed.
Output 3.2	Partnership with relevant actors from community to cabinet	Completed.
Output 3.3	Awareness in the community and national level of best practices for sustainable development of Water, Land, & coasts enhanced	Completed.
Output 3.4	Knowledge Exchange in Related/Relevant Areas	Completed.

## Financial Summary

### SPC-R2R Financial Contribution

Amount	Total Amount Spent	Utilization Rate <sup>3</sup> (Percentage)
\$176,864.00	\$142,833.17	80.78%

### Materialized Co-financing

A co-financing in the amount of USD 560,474 was planned (refer to the letter of commitment). Actual co-financing mobilized is indicated in the table below as USD 181,600.

Name of Co-financer	Type of Co-financing <sup>4</sup>	Amount <sup>5</sup> (USD)
Kosrae Conservation & Safety Organization (KCSO)	(in-kind) Miscellaneous Expenses	600.00
KCSO	(in-kind) Office Space – Rental & Maintenance	11000.00
KCSO	(in-kind) Staff Time input	90,000.00
DECEM	(in-kind) Staff Time input	80,000.00

<sup>3</sup> Amount spent divided by amount budgeted/planned multiply by 100.

<sup>4</sup> Grant or In-kind

<sup>5</sup> Total cash and monetized in-kind contributions.



# Implementation Progress Ratings

## 1. Inputs:

Project planned inputs were not all supplied as indicated in the project document or as planned. Some of the major input expected was technical support and capacity enhancement in water sampling and water quality testing, as well as consultancy, to conduct a number of outputs under national component 2. Unfortunately, due to the pandemic, technical support and capacity enhancement expected from the Regional Programme Coordinating Unit (RPCU) were not delivered. The RPCU procured a water quality test kit and accessories and training planned, awaiting borders to open. However, this did not happen during the project life. The FSM pilot project also faced some difficulty with procuring out-of-state consultants, but later procured local consultants. On the other hand, the project was able to receive all funds, and technical support in preparing contracts and ToRs for consultants, but with little to no issue because of restrictions of movements and borders closed.

## 2. Outputs:

Delivering project outputs were very slow and the timing was unsatisfactory. Although most of the outputs (approximately 80%) have been completed, the objectives might not have been achieved. Both demonstration sites for component 1 were completed, however with limited time and capacity to monitor, demonstrating the long-term effects to the public was not achieved. This experience provides insight as well as lessons on how to improve better delivery of outputs. Utilizing partnerships and collaborative activities to engage local farmers in capacity enhancing training proves to be better in pilot projects like the FSM-IW R2R Project. The major hindrance to successful and timely delivery was the availability of materials to construct demonstration projects and the capacity on-island to procure for consultant work.

## Stress reduction target:

FSM environmental stress reduction target is a 200-ha area protected using catchment measures. The development of the Tofol Integrated Catchment Management Plan was initiated. The implementation of protection measures in the plan is unlikely going to have a full impact known within the life of this project. For instance, the FSM IWR2R project reported the construction of DLT units that works on a reduction of effluents released into the Mutunnenea Channel due to the dry litter piggery technology. However, the pandemic did not allow the materials to build the DLT units to be shipped into Kosrae, thereby affecting the completion of all DLT units of the project. Local procurement took close to four (4) months and there were no consultants hired for a long time.

Nonetheless, four consultancies were commissioned aimed at delivering on the FSM IW R2R stress reduction target of 200 ha: -

- i. Completed the biological assessment of the Tofol watershed
- ii. Completed the hydrological and geological assessment of the Tofol watershed
- iii. Completed diagnostic analysis consultations and reporting for both the Tofol demonstration site and the IDA for the whole of Kosrae State
- iv. The Tofol integrated catchment management plan was abandoned following the departure of the local consultant even before work commences.

Technical and diagnostic reports of the IWR2R project support the implementation of measures and reform. Despite the situation in (iv) above, a lot of work was done which would support the management plan for catchment protection measures of 160ha.

### 3. Objectives:

Although most of the outputs have been completed, the objectives might not have been achieved. Both demonstration sites for component 1 were completed, however with limited time and capacity to monitor, demonstrating the long-term impact to the public was not achieved. This could be remedied easily under normal situations without COVID-19, and with more capacity enhancing activities from relevant partnering agencies or organizations on-island or within the nation/region.

Generally, FSM’s IW R2R national demonstration project’s relative high achievements of outcomes and outputs support delivering on the project objectives. For instance, the project (1) demonstrated innovative approaches to Integrated Ridge to Reef Catchment Management in Kosrae, FSM, (2) establish a Kosrae Island Diagnostic Analysis Report that outlines specific reforms and policy actions needed for the State Freshwater Resources Management Plan, and (3) strengthened Kosrae State and local capacity for Integrated Ridge to Reef Catchment Management to enable best practice in coastal waters, land and public health protection.

Given the investments of the project in catchment protection and management, it is important to continue work on completing the management plan. Therefore, the DECEM continues supporting the Kosrae Conservation and Safety Organization (KCSO) to complete the management plan and if possible, the Kosrae State Strategic Action Framework and Implementation Plan. Equally, DECEM and KCSO need to follow up in monitoring and documenting the experience in the future. These efforts and experiences are expected to feed into future upscaling and mainstreaming of the R2R approach in the State and throughout the country.

### 4. Sustainability:

The project is sustainable relative to its intended results. Accordingly, the stakeholders were supportive to carry out duties beyond project closure and including relevant agencies in the project site of Tofol and more broadly in Kosrae State. Partnering agencies or organizations within the region that already have the technical skills, knowledge and capability can offer technical support as requested. Table 4 in earlier sections of this report shows the range of project stakeholders and partners agencies in the Kosrae State government and the private sector.

The FSM International Waters R2R project supports the demonstration of innovative approaches to Integrated Ridge to Reef Catchment Management on Kosrae Island by providing technical support through capacity building, awareness and advocacy related to the management of water resources and the provision of water supply and sanitation services. Also, the stakeholders identified three (3) priority environmental problems during the IDA workshops, namely, invasive species, coastal erosion, and solid and liquid waste (George & Skilling, 2021<sup>6</sup>). The issue of sedimentation was considered an additional 4<sup>th</sup> priority. The prioritized options for reform and action are as set out in Kosrae State Island Diagnostic Analysis Report.

### 5. Risks/Assumptions/Conditions:

Context	Specify the identified Conditions, Assumptions and Risks	Provide your assessment in this column
Conditions	Collaborative Partners – Synergy	<b>(L)</b> Partner organizations collaborated in community outreach and awareness activities, consultation workshops, and technical activities.
Assumptions	Ease of Procuring Consultancy Services	<b>(H)</b> Procuring consultancy services on the island was close to impossible. The regional consultancy was not possible when the pandemic forced borders to close.
Risks	Materials availability on-island	<b>(S)</b> Materials needed for the demonstration project were not all available on the island, and had to be shipped, causing a delay in the deliverance of the demo project.

<sup>6</sup> George, A. & T. Skilling, 2021. Island Diagnostic Analysis Report for Kosrae State, Federated States of Micronesia. Prepared for the Department of Environment, Climate Change and Emergency Management, FSM. Produced and published by GEF Pacific International Waters Ridge to Reef Regional Project, Pacific Community (SPC), Suva, Fiji, 41 pp.

## **6. Overall Implementation Progress Rating**

The implementation progress for the FSM IW R2R Project is moderately satisfactory, recognising the project did not deliver on two out of twelve outputs of the project. As expected, it is always important to clearly state the risks and assumptions of the project and plan better to minimise such risks.

Both demonstration sites for component 1 were completed, however with limited time and capacity to monitor, demonstrating the long-term effectiveness to the public was not achieved.

The availability of materials to construct demonstration projects compromised the project goal to construct and operationalize at least 3 DLP units. Thus, the goal was revised to just 1 DLP unit within the project area. However, it is important to note that the lessons learned from the construction of the DLP unit were able to be of great assistance and technical support to other ongoing projects that involved DLP.

Originally, the stakeholders and other partnering organizations aimed to pilot a terrace farming site, but after much deliberation, the project team deemed this unrealistically possible due to excessive earthmoving and the absence of willing farmers to employ the technique.

# Project Contributions to the Regional IW R2R Program Outputs and Outcomes

1. National demonstration to support R2R ICM/IWRM approaches for island resilience and sustainability. Specifically an account of the status of:

1.1 Successful pilot projects testing innovative solutions involving ICM, IWRM and CCA (linked to the STAR via a larger Pacific R2R network).

*Reduction in nutrient and pathogen contamination from implementing soil-erosion control “green-belt farming” (GBF) and the conversion of traditional wash-down piggery to “dry-litter piggery” (DLP) technique.*

*GBF plot monitoring showed better soil retention. The GBF plants used prospered in the plot as well.*

*DLP unit constructed and operationalized lead farmer shutting down his traditional wash-down piggery. The traditional wash-down piggery was placed less than 10 feet from the Mutunnenea Channel. Ceasing the wash-down technique reduces the nutrient and pathogens from piggery.*

*Despite the issues encountered, the FSM IWR2R contributed 160 ha to catchment protection and management measures of the Regional IWR2R project, which in turn, contributed to the GEF’s target.*

1.2 National Diagnostic analysis for ICM conducted for prioritizing and scaling up key ICM/IWRM reforms and investments.

*Tofol Watershed was identified as an important catchment for the Kosrae State. The Kosrae IDA report sets out clear priority environmental problems and strategic reforms and actions, as well the background towards mainstreaming R2R and effective integration of natural resources governance and development planning.*

1.3 Multi-stakeholder leader roundtable networks established for strengthened ‘community to cabinet’ ICM/IWRM.

*FSM Ridge to Reef Program – National Steering Committee, and each State Component’s Technical Advisory Committee.*

*As outlined in this report, the level of multi-stakeholder partnerships and collaborations amongst partner agencies and organisations between public-private agencies and communities provided successful and consistent with the community to cabinet concept.*

*For instance, the FSM IW R2R Project in Kosrae, in collaboration with the FSM R2R STAR Project (STAR), the Kosrae Conservation and Safety Organization (KCSO), the Kosrae Island Resources Management Authority (KIRMA), the Lelu Town Government and the community members of Lelu Municipality, initially planned to address the issue of water quality of Mutunnenea Channel through a joint effort to reduce the nutrient load released into the water. It was agreed to convert regular existing piggeries along the banks of the Mutunnenea Channel. The site was predetermined, but the project will serve as a demonstration, a pilot site, as well a baseline for future such endeavours.*

2. Island-based investments in human capital and knowledge to strengthen national and local capacities for R2R ICM/IWRM approaches, incorporating climate change adaptation

- 1.1 National and local capacity for ICM and IWRM implementation build to enable best practices in integrating land, water, forest and coastal management and climate change adaptation.

*5 national experts enrolled and completed the post-graduate certificate program in Ridge to Reef Sustainable Development at James Cook University. There are at least over 100 people who benefitted from increased knowledge, awareness and skills from a range of project activities such as schools' visits, national events, such as environment or water day, committee meetings, stakeholder training and workshops.*

- 1.2 Incentive structures for retention of local R2R expertise and inter-governmental dialogue on human resource needs for ICM/IWRM initiated.

*Technical support was provided for other ongoing projects employing the DLP technique. The Project Manager and KSCO participated in several forums providing inputs and showcasing the IW R2R project.*

3. Mainstreaming of R2R ICM/IWRM approaches into national development planning

- 1.1 National and regional strategic action frameworks for ICM/IWRM endorsed nationally and regionally

*The joint STAR and IW R2R Board or Inter-Ministerial Committee (IMC) serves to oversight and provide policy decisions on the projects including approving and signing off on the annual workplan and budget and other strategic technical reports generated by the projects. These functions are central to mainstreaming R2R ICM/IWRM approaches into national development planning.*

*In the IMC meetings, regional and international partners like UNDP, SPC, USP and others participate as observers and strengthen the work of the IMC relative to technical inputs. The discussion benefitted project implementation through sharing of information and experiences and importantly, as a basis for decision making and R2R investments.*

- 1.2 Coordinate approaches for R2R integrated land, water, forests and coastal management and climate change adaptation

*As outlined earlier, Kosrae State is employing more community cabinet consultation. Environmental and Resource Management agencies and organizations also understand the importance of ridge to reef integrated planning and adaptation. Awareness programs and educational programs have also been highlighting the importance of anthropogenic causes and impacts on climate change adaptation and ridge-to-reef resources management. The IWR2R project complements past and parallel efforts in the integration and cross-sectoral management of natural resources covering land, water, forests, coastal management and climate change adaptation and mitigation.*

*The linkage and coordination of the joint IW/R2R national steering committee with existing and other related IWRM committees can be further strengthened and streamlined in future R2R investments. There is a sign of 'meeting fatigue' observed particularly where the same people are participating in multiple committees and boards of other projects.*

# Project contributions to the GEF Focal Areas, SDGs including Special Themes

## GEF Focal Areas

The FSM IW-R2R Project aims to address the concerns and impacts on conjunctive management of fresh and groundwater resources to ultimately improve marine ecology, enhance the water quality, strengthen coastal habitats.

- International Waters
- Biodiversity Conservation
- Land Degradation
- Climate Change Adaptation
- Sustainable Forest Management

The demonstration of the Green Belt Farming (GBF) technique is to encourage landowners to practice soil-erosion control farming. This will not only reduce the nutrient load to the bodies of water but will slow and even prevent soil erosion. This technique also introduces a landscape management tool that could be income-generating soon.

The Dry-Litter Piggery demonstration is to promote eco-friendly animal domestication and at the same time turn waste into wealth with manure composting. Converting piggery technique ensures less nutrient and pathogen release from the traditional wash down piggeries. DLP unit constructed and operationalized lead farmer shutting down his traditional wash-down piggery. The traditional wash-down piggery was placed less than 10 feet from the Mutunnenea Channel. Ceasing the wash-down technique reduces the nutrient and pathogens from piggery. Converting the DLP unit also ensures better environmental health – ultimately providing healthier water for the body. Farmers have also noted and acknowledged the cleaner and safer environment.

Kosrae's Coastal Environment provides its best and most effective defence against climate-related hazards. The well-being of the coastal environment is dependent upon the degree to which anthropogenic activities impact the area from Ridge through to Reef. Preservation of catchments and in particular upland areas is vital to the maintenance of quality surface and groundwater inflows to the coastal areas. Likewise, the maintenance of a quality coastal environment offers improved sustainability for lagoonal and reef resources vital to food security.

The need to preserve and protect Kosrae's Coastal Environment has resulted in the development of a comprehensive Shoreline Management Plan which has been endorsed by the Kosrae Government. The plan recommends the staged and planned relocation of coastal communities to upland areas which are currently undisturbed. This will have a major impact on land use and its associated impacts on waterways.

The IW R2R Demonstration project will seek to complement the Shoreline Management Plan through the development of the Kosrae State Integrated Freshwater Resources Management Plan that will serve to catalyse an integrated Ridge to Reef approach to the sustainable development of upland catchments.

Some of the above issues have begun to be addressed through the cross-sectoral planning and management initiatives of the GEF Pacific IWRM Project. Needs still exist and have been identified within a Ridge to Reef context. These include improving land-use practices; reducing pathogen and nutrient contamination of ground and coastal waters; assessing Kosrae's freshwater resources; establishing community-based management of waterways and enhancing community and national level awareness of best practices in sustainable management.

The project team, along with partnering organizations, also always link climate change adaptation to materials during community consultation and outreach workshops conducted. The project team emphasizes anthropogenic impacts to show the significance of project activities and materials presented.



# Sustainable Development Goals (SDGs)

Below is the summary of the project contributions to the relevant Sustainable Development Goals.

SDG	Project contributions
SDG 1 – No poverty	
SDG 2 – Zero hunger	
SDG 3 – Good health and well-being	DLP not only ensures less pathogen release to body of waters, it also ensures cleanliness of farm, thus better health from less pollution from the water and the land.
SDG 4 – Quality education	
SDG 5 – Gender equality	
SDG 6 – Clean water and sanitation	DLP & GBF ensures a reduction in nutrient and pathogen to body of water
SDG 12 – Responsible production and consumption	
SDG 13 – Climate change	
SDG 14 – Life below water	Reduction in nutrient and pathogen released into water supports better health and condition of water and life below water
SDG 15 – Life on land	
SDG 17 – Partnerships for the goals	

## Special Themes

1.

*National staff and stakeholders trained in Gender Mainstreaming and gender analysis of the national pilot project. With facilitation from the project and SPC, stakeholders identified supportive factors, possible barriers, as well as tools and approaches for gender work.*

*Women in Farming – Kosrae (WIFK) participated in SPC/RPCU funded knowledge exchange program regarding Dry-Litter Piggery and compliance held in Pago Pago, American Samoa.*

*NPM and partnering organizations participated in WIFK workshop to support with technical knowledge and capabilities regarding erosion control for upland farming.*

The matrix below is the result of the gender workshop in the FSM and participants were asked to rank the issues of accessibility and ownership by men, women, and youths. Accordingly, men and women have equal access to resources with women having more control over land and natural resources than men. The details are set out in the FSM Gender Action Plan.

	Men	Women	Young men	Young women
Land ownership/control	8	10	5	5
Natural Resource access/ including water	10	10	5	5
Mangrove areas, coastal fisheries access	5	10	5	5
Forestry/agriculture access	10	7	7	4



# Lessons Learned (Innovations and Catalytic Impacts)

## 1. Testing and Replicating Innovative Technologies are Costly Exercises Requiring Sustained Resource and Resourcing Support

The innovative technologies and measures tested and implemented were the dry-litter piggery (DLP) and the green-belt farming (GBF). The co-existence and implementation of these two innovations offer direct benefits to each other, such that, the piggery compost serve as fertilizer for the farms, and certain proportion of the farm produce can be fed to the pigs. Both innovations provide catalytic impacts to improving livelihoods and reduction of nutrients discharged into the environment.

As expected, community members showed great interest and engagement in DLP and GBF, especially when the benefits and results were visible. Farmers expressed their willingness to adopt the DLP technique but have also voiced their ultimate concern – which was evident in project implementation – the cost of replication.

Materials used to build the DLP unit are very costly, especially for a typical farmer. Most of the materials could only be provided by one single vendor. Of those materials, 75% had to be shipped in from Pohnpei, the vendor's main warehouse, which factors in a variable, almost impossible to control – time.

It is important to note that there have been several replications of the DLP across Kosrae – most if not all, funded by other ongoing projects. This demonstrates the willingness to adopt the innovations, as well as the inability to afford them without external funding assistance. The project team was largely involved in one of the said replications and assisted mainly with raising awareness of the technique and its impacts, and with technical support in terms of designing units.

It generally takes time and resources to support the testing of innovations to generate convincing results that would lead to behavioural change. For the most part of the demonstration project, there were numerous awareness-raising opportunities, supported by the efforts of DLP and GBF's innovative technologies. Water quality testing and monitoring could have added value to the demonstration to better observe the impacts of the innovations in reducing pollution and contamination from waste and pollutants of land-based activities.

## 2. Project Personnel – Country Capacity and Access to Skilled/ Trained Persons Remain Challenging

The FSM national project had one full-time staff – the project manager and was supported by a project team consisting of partnering agencies' staff, including key staff from DECEM and KCSO. However, the implementation of project activities sometimes lagged, due to team members not providing full-time support and having their own jobs.

Nevertheless, multilateral partnerships among the team members provide a platform for sharing experiences and initiating synergies. This includes improved collaboration, planning and implementation of project activities such as awareness programs and thereby others resulting in more influential and effective outcomes.

## 3. Strategy Lessons – Programmatic and Participatory Approaches Support Informed Decisions and Successful Project Implementation

The project inception offers a strategic lesson because it provides an opportunity to explain clearly important and relevant details of the project and respond to questions. For instance, the stakeholders can use the opportunity to understand better what the project means to the local communities and Kosrae State and how it will contribute to FSM commitments nationally, regionally, and internally. Without an inception meeting, the progress of implementation would have been severely impacted.

The project multi-year costed workplan (MYCWP) and result framework also provide guidance and understanding on the range of project activities implemented over the project life. The key lesson is ensuring the work plans and result framework are closely monitored and, with changing circumstances, maintain the ability to continually revisit such strategic annual workplan. Follow up meetings and training workshops or consultations also offer additional opportunities to discuss strategic changes to work plans and project work without necessary changing project goals and outcomes.

#### **4. Cooperation Lessons – Internal/ External Partnerships and Collaboration Minimize Unnecessary Delays & Costly Efforts**

The FSM IWR2R project benefits from the cooperation and collaboration support of the partner agencies and organizations. It is important the partners are well informed of progress and invited to participate and co-partner from design to implementation. Factors of cost and effective contributions to project planning and implementation are important considerations in managing the levels and extent of cooperation or collaboration. The project site is Tofol Catchment in Kosrae State therefore selection of partners and collaborators in support of implementation confines to relevant stakeholders and agencies in Kosrae State. This was not the case and is an important lesson for future R2R investments.

#### **5. Processes Lessons – whether the project has contributed to a more streamlined process that leads to efficiency**

The FSM IWR2R project which focuses on the Tofol catchment in Kosrae State has generated new baselines and data, and diagnostic reports, which are important contributions to future integrated R2R investments and ICM planning. It is unclear if the project has contributed to a more streamlined process that leads to efficiency. However, the R2R tools and guidelines including that of the science to policy and, the R2R spatial prioritization procedures offer useful lessons for future R2R investments and ICM planning.

#### **6. Steering Lessons – how the project has been steered towards its objectives**

The joint STAR and IW R2R Project Steering Committee offers an excellent example of a programmatic approach that benefitted both projects. A lot of the decisions and discussions taking place at this committee not only demonstrate a cost-effective way of conducting business in managing projects in-country but also streamline processes and unnecessary cost and time for several of if not most members of the project steering committee.

A federal system like FSM where the central government is based in Pohnpei and the IWR2R project is in Kosrae makes steering the project tricky but not impossible. The steering model in this project has led to its success in delivering on outcomes and objectives and being replicated in other States.

# Annexes

Annexes	Title of the document
Annex 1	Island Diagnostic Analysis Report for Kosrae State, FSM; <a href="https://www.pacific-r2r.org/sites/default/files/2021-12/FSM_IDA.pdf">https://www.pacific-r2r.org/sites/default/files/2021-12/FSM_IDA.pdf</a>
Annex 2	Tofol Watershed Catchment Geological Assessment from Ridge to Reef, Kosrae State, FSM; <a href="https://www.pacific-r2r.org/sites/default/files/2021-11/FSM_Tofol_Watershed_Geological_Survey.pdf">https://www.pacific-r2r.org/sites/default/files/2021-11/FSM_Tofol_Watershed_Geological_Survey.pdf</a>
Annex 3	Tofol Watershed Catchment Biological Rapid Assessment, Kosrae State, FSM; <a href="https://www.pacific-r2r.org/sites/default/files/2021-11/FSM_Tofol_Watershed_Biological_Survey.pdf">https://www.pacific-r2r.org/sites/default/files/2021-11/FSM_Tofol_Watershed_Biological_Survey.pdf</a>
Annex 4	GEF Pacific R2R Programme - FSM National R2R Programme Document; <a href="https://www.pacific-r2r.org/sites/default/files/2020-03/FSM.pdf">https://www.pacific-r2r.org/sites/default/files/2020-03/FSM.pdf</a>
Annex 5	FSM IW R2R project progress June 2018; <a href="https://www.pacific-r2r.org/sites/default/files/2020-03/Project_Progress_Federated%20States%20of%20Micronesia.pdf">https://www.pacific-r2r.org/sites/default/files/2020-03/Project_Progress_Federated%20States%20of%20Micronesia.pdf</a>
Annex 6	FSM Lessons Learned – Twinning Exchange (American Samoa) – Piggery Waste Management; <a href="https://www.pacific-r2r.org/sites/default/files/2020-07/workshop-summary-report-18-21.pdf">https://www.pacific-r2r.org/sites/default/files/2020-07/workshop-summary-report-18-21.pdf</a>
Annex 7	FSM IW R2R project Most Significant Change story 2019 – Community is Aware now <a href="https://www.pacific-r2r.org/sites/default/files/2020-03/MSC_Poster_FSM_IW.pdf">https://www.pacific-r2r.org/sites/default/files/2020-03/MSC_Poster_FSM_IW.pdf</a>
Annex 8	FSM STAR R2R project Most Significant Change story 2019 – Dry Litter Piggeries in Kosrae
Annex 9	Lessons learned from the FSM Ridge to Reef project <a href="https://www.pacific-r2r.org/sites/default/files/2021-07/FSM_STAR_R2R%20Lessons%20Learned.pdf">https://www.pacific-r2r.org/sites/default/files/2021-07/FSM_STAR_R2R%20Lessons%20Learned.pdf</a>
Annex 10	Asset Listing & External Transfer Form <a href="https://drive.google.com/drive/folders/1u6lA_ffSP1JSVevhIW2BNpo-9GJcgRIP">https://drive.google.com/drive/folders/1u6lA_ffSP1JSVevhIW2BNpo-9GJcgRIP</a>
Annex 11	Tofol Site Diagnostic Analysis Report, Kosrae, FSM <a href="https://www.pacific-r2r.org/sites/default/files/2022-04/Tofol%20FSM%20SDA%20Site%20Diagnostic%20Analysis%20Report.pdf">https://www.pacific-r2r.org/sites/default/files/2022-04/Tofol%20FSM%20SDA%20Site%20Diagnostic%20Analysis%20Report.pdf</a>
Annex 12	FSM Ridge to Reef Program Document <a href="https://www.pacific-r2r.org/sites/default/files/public/2020-03/FSM.pdf">https://www.pacific-r2r.org/sites/default/files/public/2020-03/FSM.pdf</a>
Annex 13	FSM Progress Report 2018 <a href="https://www.pacific-r2r.org/sites/default/files/public/2020-03/Project_Progress_Federated%20States%20of%20Micronesia.pdf">https://www.pacific-r2r.org/sites/default/files/public/2020-03/Project_Progress_Federated%20States%20of%20Micronesia.pdf</a>