



Kiribati International Waters Ridge to Reef Project

By: Ministry of Environment,
Lands and Agricultural Development (MELAD)



Final Report 2016 to 2021

Prepared by: Teema BIKO
Project Manager



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July 2022

Preface

Kiribati is faced with increasing freshwater scarcity issues and groundwater lenses and aquifers are at risk of contamination due to human and animal wastes. Water scarcity and quality are further worsening with increasing population, inappropriate sanitation, and stress levels influenced by climate variability and change. At the same time, the coastal water is also affected by increasing population, illegal dumping of solid waste, illegal sand and aggregate mining, and poor on-site sanitation. About half of the South Tarawa has access to basic sanitation services, the remaining share either sanitation facilities, poor onsite sanitation systems such as pit latrines, or uses open defecation to which 60 per cent of the population resort at least occasionally. There is less than 20 per cent of the population is connected to the sewage system.

If these issues are not addressed will lead to an outbreak of diseases and more broadly impact on livelihoods and the country's vulnerable economy. In the past, there have been cases of a high incidence of water-related diseases (mainly diarrhoea), especially among children which may be attributed to people still using groundwater, which is contaminated by nearby sewage soak pits, leaking toilets pipes, and faeces from Tarawa lagoon and local pig pens.

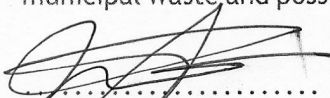
With assistance from partners, the government continues to work towards addressing the above issues and supporting operations of the Water Reserves, as well, as working with relevant agencies to improve water and sanitation at the household level and amongst communities. In Tarawa, groundwater is extracted and processed at the Bonriki/Buota Water Reserves and distributed to households in South Tarawa. It is important to support efforts of monitoring and enforcement of policies and regulations aimed to minimise and remove abuse or loitering of the Water Reserves. For instance, settlements on reserved land often link to a possible build-up of waste leakage to groundwater and aquifers from septic and piggeries. At the Water reserve, there is at least an annual population growth of 2.0%, inadequate and inappropriate sanitation, and further stress by climate variability and change.

In Kiribati, the responsibilities for freshwater quality monitoring and management are shared between several government agencies. The IW R2R project, which focused on testing the integration of land, water, coastal management and climate change, has contributed to strengthening the collaboration and coordination of efforts between the Ministry of Environment, Lands and Agriculture (MELAD) and other line ministries such as the Ministry of Infrastructure and Sustainable Energy (MISE) and the Ministry of Health and Medical Service (MHMS), in the planning and monitoring of water quality sampling and assessment work in water reserves. The two ministries provided co-finance support to the project through staff time and availability assisting with the sample collection and conducting biological tests) and other related tests.

Furthermore, the collaboration of the IW R2R project with Solid Waste Management Stakeholders has increased the awareness of the key partners on how the system can address the issue of the growing amount of organic waste generated from households in South Tarawa. During the development of the Kiribati Waste Management and Resource Recovery Strategy (KWMRRS), stakeholders have identified dry litter technology as a potential solution to managing organic wastes in households, therefore, resulting in the government committing to construct at least 30 systems annually.

The government of Kiribati through the MELAD acknowledge the support from GEF and its implementing agencies for the support toward the project implementation in the country. The MELAD wishes to say "Kam bati n rabwa" (thank you) to our national stakeholders, who have been engaged and involved actively throughout the implementation of this project. No doubt, the project results and outcomes will assist and add value to future R2R investments and ICM planning in the country.

I commend this final report to all stakeholders and interested agencies for reference and supporting our collective efforts to address ongoing issues of groundwater lenses/aquifer contamination from municipal waste and possibly other contaminants in the country.



Mrs. Saitofi Mika

Secretary

Ministry of Environment, Lands and Agricultural Development (MELAD) Tarawa, KIRIBATI

Acronyms

| | |
|-----------|---|
| ALD | Agriculture and Livestock Division |
| DLT | Dry Litter Technology |
| CEPA | Communication, Education and Public Awareness |
| ECD | Environment and Conservation Division |
| EHU | Environmental Health Unit |
| FAO | Food and Agriculture Organization |
| GEF | Global Environmental Facility |
| GEF SGP | Global Environment Facility Small Grants Programme Institute of Applied Sciences of the |
| IAS – USP | University of the South Pacific (IAS- USP). |
| GEM | Geoscience, Energy and Maritime Division of the Pacific Community (GEM-SPC) |
| ICM | Inter-ministry committee |
| IW | International Waters |
| KEMIS | Kiribati Environment Information Management System |
| KIEP | Kiribati Integrated Environment Policy |
| LDCF | Least Developed Countries Fund |
| M&E | Monitoring and Evaluation |
| MYCWP | Multi-Year Costed Workplan |
| R2R | Ridge to Reef |
| RPCU | Regional Programme Coordination Unit |
| SPC | The Pacific Community |
| UNDP | United Nations Development Programme |
| UNE | United Nations Environment |
| VPWMN | Volunteer piggery waste management networks |
| WFP | Work and Financial Plan |

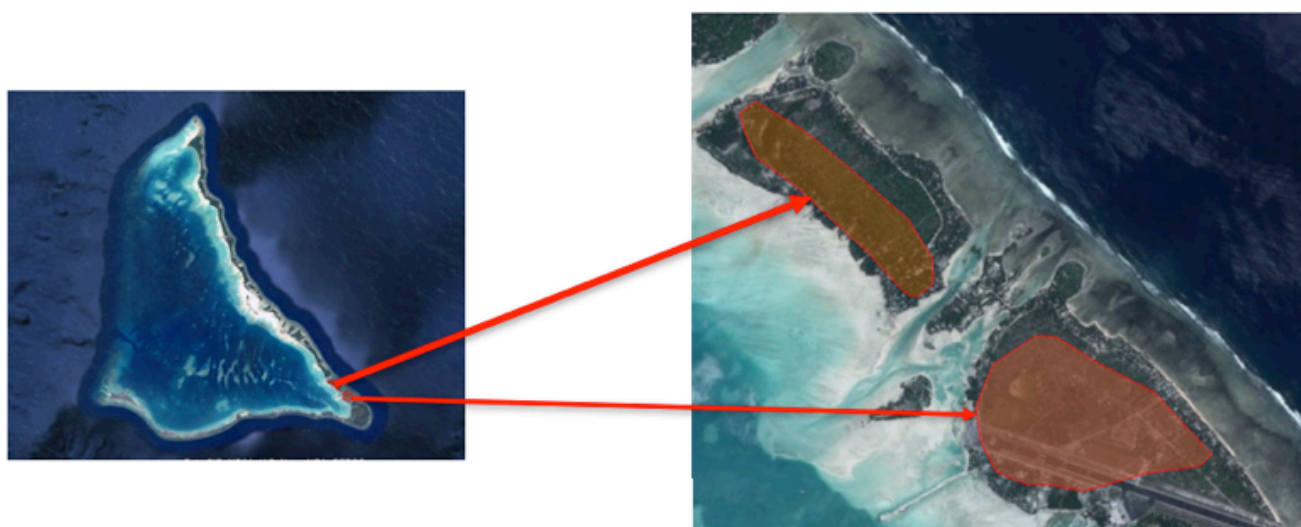
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Basic Project Data

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| Project Title | GEF Pacific International Waters Ridge to Reef Project - 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 |
| Project Site/ Location | Water Reserves in North Tarawa (Buota) & South Tarawa (Bonriki) |
| Project Objectives | <ul style="list-style-type: none"> Local capacity for sustainable and cost-effective piggery waste management using dry litter technology (DLT) stimulated through effective community engagement and training, thereby contributing to reducing nutrient offload, and contamination in Buota and Bonriki water reserves, underground water lenses and adjacent coastal/marine ecosystem Demonstration of innovative approaches to pig waste management through trialing and testing of Dry Litter Technology (DLT) composting system Information management and community awareness increased in support of sustainable animal waste management at individual household levels |

| | | |
|-----------------------------|---|---|
| Contract Information | Contract number | MoA 17/470 |
| | Original Project Duration | 14 October 2016 – 31 December 2019 |
| | Contract Extension (if applicable) | Extension 1 – 31 December 2020 Extension 2 – 30 June 2021 |
| | Contracting Party | Ministry of Environment, Lands and Agricultural Development (MELAD) |
| | Contracting Party Signatory | [Former] Secretary - Mr. Moannata Ientaake; [Current] Secretary - Mrs. Taare Uriam Aukitino (2019 - 2021) |
| | Contract Amount (SPC-R2R) | USD 200,000 |
| | Counterpart (Agency, Department) | USD 500,000 |
| | Counterpart of other partners (e.g., development partners, NGOs, CSO, Academic, etc.) | USD 58,000 |



Kiribati IW R2R Demonstration Project Site – Bonriki Water Reserve and Buota Reserve

Executive Summary

The Kiribati IW R2R Project is focused on addressing the municipal waste problem and its impact on the underground water lenses and aquifers. It aims to build capacity of all sectors of the communities for sustainable piggery waste management, improved information management, and with intended outcomes of reduced pathogen and nutrient offload into the receiving environment of aquifers and underground water in the Reserves. The project target is a 5% reduction in total nitrogen from nutrient and pathogen loads from pigs' effluent discharge directly into the receiving Environment. This is equivalent to 955 kg TN per year and to be achieved through construction of 30 Dry litter technology piggeries. The project successfully completed its outputs and outcomes recognising the impact of delivering on the 5% target in reduction of total nitrogen from nutrient offloads will take time into the future.

The IW R2R project adopted the approach of integrated science evidence-based, and Kiribati's cultural way of thinking towards the importance of keeping households' piggery toward policy and legislation development. The results from the project water quality monitoring, together with previous data reviewed by the project itself, have assisted significantly to strengthen the provisions of the new Environment Act 2021 related to piggery operation at the country level. Important lessons from the implementation of this project, including some of its key findings, have also informed the development of the Waste Management and Pollution Prevention Thematic Area of the Kiribati Integrated Environment Policy (KIEP), which is now under discussion with the Government's Cabinet. The new Environment Act 2021, which has recently endorsed by Parliament in December 2021, has new and detailed provisions that prohibit the erection of pigpens within the water reserve areas. The act also recognizes –environment-friendly design options trialled by this project in its piggery operation manual.

The project has three main components including:

- Local capacity for sustainable piggery waste management using dry litter technology (DLT) stimulated through effective community engagement and training thereby contributing to reducing nutrient offload and contamination in Buota and Bonriki water reserves, underground water lenses and adjacent coastal/marine ecosystem
- Demonstration of innovative approaches to pig waste management through trialing and testing of Dry Litter Technology (DLT) composting system
- Information management and community awareness increased in support of sustainable animal waste management

The Kiribati IW R2R project faced many challenges and issues and some of these included challenges encountered at the start of the project in 2016, the change of focus of the demonstration project. and the turn-over of staff within SPC. Consequently, the Kiribati IW R2R project picked up momentum in September 2019 after the project recruited a Project Manager and had its inception workshop with the Project Steering committee, where the project logframe and workplan were approved.

Despite challenges, the Kiribati IW R2R made significant progress late in 2019 following the recruitment of the project team and the approval of the revised logframe and MYCWP by the Project Steering Committee in February 2019. Subsequently, the project successfully progressed through implementation which includes the construction of thirty (30) dry litter technology pigpens in Bonriki and conducting water quality testing and assessment of boreholes and wells in the Bonriki/Buota Water Reserve. Moreover, the project successfully conducted several consultations, training, and other community awareness activities to build the capacity of residents in and around the Reserve in sustainable animal waste management. There was an increased collaboration with key stakeholders through water quality monitoring and the construction of the pigpen. The final water assessment for Bonriki has contributed toward strengthening the Environment Act 2021 related to water and animal waste control and the implementation of the Kiribati Integrated Environment Policy (KIEP).

In summary, the Kiribati IW R2R project results and outcomes provided additional new datasets and information particularly useful for the ongoing monitoring of contamination levels of the groundwater in the Bonriki/Buota Water Reserve. It is anticipated that MELAD will continue collaborating and partnering with local communities and other partners, making available sustained resources and resourcing, to support water quality testing and monitoring, and other related interventions to minimise and remove nutrients offload from animals and human wastes at the Reserve.



Figure 1: Land-use activities contributing to water contamination & degraded coastal ecosystems (Photo: S. Sauni, 2019)

Introduction

The Republic of Kiribati consists of 32 low-lying atoll islands and one raised limestone island located in three island groups, the Gilbert Islands, Line Islands, and the Phoenix Islands. The islands are scattered over a large area (3.5 million km²) of the Central and Western Pacific. These are mostly low-lying coral atolls surrounded by extensive reefs with limited freshwater resources, inadequate sanitation, and vulnerability to climate variation and change. Coupled with this, is the fact that about half of the population now resides in South Tarawa, the Capital which brings with it additional challenges.

Kiribati IW R2R project focuses on strengthening local capacity in waste management through effective community engagement, testing of sustainable dry litter technology for reduction of nutrient offload and contamination, and increasing information management and community awareness in support of sustainable animal waste management. Effectively, underground water lenses are continually polluted by human and animal wastes making it unsafe and exceeding acceptable standards because of high levels of nutrients and pathogens.

Kiribati Government places water and sanitation amongst the top priorities and encourages support to address the associated problems. The water reserves in Bonriki and Buota service the whole population of Tarawa. Unfortunately, the communities residing illegally around and within the water reserve areas are a concern. This is specifically with respect to handling human and animal waste in the communities. The R2R IW project provides an opportunity to use piggery dry litter technology by the community to help reduce nutrient load and pathogen release to the receiving environment.

GEF Pacific Programme Framework Document – maintain and enhance the Pacific Island Countries (PICs) ecosystem goods and services through integrated approaches to land, water, forest, biodiversity and coastal resource management that contribute to poverty alleviation, sustainable livelihoods, and climate resilience.

The IW R2R project aims to test the mainstreaming of climate resilience approaches to integrated land, water, forest, and coastal management in the PICs through strategic planning, capacity building and piloted local actions to sustain livelihood and preserve ecosystem services.

The Kiribati IWR2R result framework is comprised of the following components:

- Local capacity for sustainable and cost-effective piggery waste management using dry litter technology (DLT) stimulated through effective community engagement and training thereby contributing to reducing nutrient offload and contamination in Buota (North Tarawa) and Bonriki (South Tarawa) water reserves, underground water lenses and adjacent coastal/marine ecosystem;
- Demonstration of innovative approaches to pig waste management through trialing and testing of Dry Litter Technology (DLT) composting system; and
- Information management and community awareness increased in support of sustainable animal waste management.

Generally, the Kiribati IW R2R project is implementing its MYCWP aimed at progressing project outputs and activities, which in turn assist delivery of a stress reduction target of 955 TN kg/yr. Using conversion factors, the construction and operation of 30 DLT piggery units would correspond to achieving the above-mentioned stress reduction target of municipal waste pollution.

Several local consultants were hired to assist with the technical streams of work, namely: -

- i. Design and construction of the dry litter pigpens for the reduction of municipal waste pollution of 955 TN kg/yr.
- ii. Communications and awareness raising
- iii. Diagnostic analysis, State of the Coast and Strategic Action Framework

The monitoring of boreholes and household wells has commenced following its environmental monitoring plan. The baseline data is available, and monitoring would allow the determination of the end of project stress reduction target and see if the R2R interventions contributed to stress reduction and minimize underground contamination. At this stage, there appears to be slow progress to agree on a design and construct of DLT piggery units. This also means it is getting difficult to establish clear determination.

The Kiribati IW R2R project successfully completed the construction of 30 Dry Litter Technology piggery units which in turn, led to the achievement of stress reduction of 955.35 TN kg/year.

Situational Analysis, project issues, needs

South Tarawa, the host project site is faced with challenges in terms of the availability and quality of sanitation services. About half of South Tarawa has access to basic sanitation services, while the rest of the population either shared sanitation facilities, on-site unimproved sanitation systems such as pit latrines or opted for open defecation (on land and/or on beaches). In terms of water management, south Tarawa is faced with water constrained due to small watersheds and limited opportunities for groundwater and surface water storage. The quality of the water is degraded due to many factors including the impact of over-population, low level of sanitation, and saltwater intrusion due to climate change.

The project expected results include the reduction of waste to ensure the integrity of the groundwater lenses and the protection of coastal seawater from land-based contamination activities. In Kiribati, pollution from pig waste (faecal waste) in addition to solid waste disposal has increasingly become both an environmental and health issue, especially in densely populated areas in South Tarawa and Betio. Domesticating pigs have been part of our traditional way of life as an important cultural norm since the colonial period hence public complaint related to pigs is a challenge when it comes to their removal from the densely populated area including government-leased land. Pig pens are also regulated under both TUC/BTC Council byelaws, but enforcement is often a challenge due to the sensitivity of the matter to the I-Kiribati culture. There are also no available land/space/sites appropriate for pip-pens erections in Betio and Tarawa Teinainano, which further exacerbate the matter, requiring urgent national attention, especially in densely populated areas or urban areas.

MELAD through the ECD has also attempted to raise public awareness on proper practices in pig-pens management under the Environment Amendment Act 2007, but again these efforts have been successful due to cultural related issues involved with domesticating pigs. Pigs can be a source of income for families and provide meat/protein during family functions, thus both are considered key obstacles influencing families to continue domesticating pigs at household levels.



Figure. 2: Design of wells or bore holes at Bonriki/Buota Water Reserve (Photo: S. Sauni, 2019)

Project Scope, components, and anticipated results

The table below enumerates the key components, expected outputs and anticipated outcomes.

| Key Components | Expected Outputs | Anticipated Outcomes |
|---|--|--|
| 1. Local capacity for sustainable and cost-effective piggery waste management using dry litter technology (DLT) stimulated through effective community engagement and training thereby contributing to reducing nutrient offload and contamination in Buota (North Tarawa) and Bonriki (South Tarawa) water reserves, underground water lenses, and adjacent coastal/marine ecosystem | Volunteer waste management networks (VWMN) TOR endorsed VWMN operational (TOR approved) | Volunteer piggery waste management networks are formally established towards increased community awareness, maintaining cleanliness and hygienic status within the community, and forming an enhanced culture environmental protection |
| | Sustainable options for financing documented and training delivered Technical training workshops conducted | Improved donor support for increased householder uptake of dry-litter technology for sustainable and cost-effective piggery waste management |
| 2. Demonstration of innovative approaches to pig waste management through trialing and testing of Dry Litter Technology (DL) composting systems | Appropriate onsite pig waste management piloted Dry litter Technology Operation guideline prepared | Improved domestic pig pen operations catalyzed via piloting of locally appropriate methods for on-site pig waste management |
| | Baseline review conducted Final year evaluation report | Environmental and public health is safeguarded via targeted reductions in nutrient and pathogen contamination of coastal areas |
| | Environmental Monitoring Plan developed Implement Environment Monitoring Plan | National capacity for environmental assessment and water quality analysis increased |
| | | |
| 3. Information management and community awareness increased in support of sustainable animal waste management | Formal and informal community Outreach (Communication, education, and public awareness - CEPA) Program developed Communication Strategy development and implementation enhanced, where piggery waste management and dry litter technology (DLT) are concerned | Enhanced access to effective information relating to on-site waste management issues and linkages with environmental and public health to increase public awareness |
| | Training manuals: printed materials and videos developed Dry Litter Operation guideline prepared, finalized, and endorsed | Effective management tools developed to support sustainable uptake of piggery waste management technique |
| | Database/knowledge management system established and improved Database/knowledge management system populated | Improved knowledge base and access to effective decision making |
| | | Diagnostic report for the Kiribati R2R Project |
| | | |

Project Organization and Management

The IWRM Kiribati project is managed by the Ministry of Environment, Lands and Agriculture Development (MELAD) through the Environment and Conservation Division (ECD). The specific functions and duties of the ECD, are mandated under the following legislation:

- Kiribati Environment Act 2021
- Kiribati Environment (General) Regulations 2017

The Environment Act 2021 regulate the piggery operation focusing on the issue of bad odour and pollution. Specifically, the Environment (General) Regulation 2017 recognise piggery operation involving more than ten (10) pigs as an Environment Significant Activity, therefore, requiring an environment licence to operate.

The Project Steering Committee has important roles and responsibilities in providing guidance and oversight roles for the overall implementation of the project at the national level. Members are senior officers drawn from sectors that have direct linkages with the project objectives. It is comprised of Government and NGO representatives, who potentially have important roles in the implementation of this project, namely: -

- Ministry of Health and Medical Services (MHMS) - Environmental Health and Health Statistics Units);
- Ministry of Fisheries and Marine Resources Development (MFMRD) (Coastal Fisheries Division);
- MELAD (Agriculture and Livestock Division (ALD) and the Lands Management Division (LMD);
- Ministry of Infrastructure and Sustainable Energy - MISE (Technical Design & Water Units);
- Ministry of Internal Affairs (MIA) (Local Government Division (LGD);
- Mayor Teinainano Urban Council (TUC) and Mayor – Eutan Tarawa Council (ETC) of North Tarawa);
- Ministry of Women, Youth and Social Affairs (MWYSA) (Women Development Division),
- National Coordinator Kiribati Climate Action Network (KiriCAN);
- Chairman – Tarawa Organic Farming Market Association (TOFMA); and
- Director – ECD, Project Manager IW R2R Project, Project Manager (R2R STAR).

Under the Project Steering Committee (PSC), a Technical Task Force was established as the technical arm of the PSC committee to oversee, guide, and manage the scientific and technical components of the project ensuring effective implementation of activities undertaken during the project execution; and providing sound scientific and technical advice of the Project Steering Committee (Annex 2: TOR of TTF).

At the community level, the project established a waste management network that is made up of community members, who reside on the project site in Bonriki. Additional members of this network are the elected councillors from Bonriki village, as well as the Mother Community leaders. Most of the members are the beneficiary of the pigpens provided by the project. The network's core functions are to assist the overall project's implementation at the local community level, through raising and increasing community awareness, maintaining, and promoting cleanliness and hygiene status within communities, and forming enabling environment for the enhanced culture of environment protection. Most of the members of this network are also the beneficiary of the pigpens provided by the project.

Project Stakeholders and Engagement

At the start of the project, the interim Project Coordinating Unit team comprised of the Director, Deputy Director and several senior staff of the Environment and Conservation Division The project team conducted a stakeholder analysis and identified key stakeholders who can be engaged during various stages of the project implementation to ensure its success. The project aimed to engage relevant stakeholders that have direct impacts and linkage to the project activities from relevant government ministries, NGOs representatives, and local communities, who potentially have important roles in various stages of the project.

The list from the analysis was further discussed and approved at the project inception workshop held in 2018. The cabinet is also informed of the composition of the committee with the understanding that there are secondary stakeholders, who would be engaged at some point during the implementation, to provide technical support and recommendation toward achieving the outcomes of the project.

Involvement of the elected island councillor Bonriki (project site (Bonriki), who is also a local to the project site and is well known in Bonriki village. The elected Councillor has been instrumental in effective coordination with local communities, which includes supporting the demonstration project workshops and meetings. He attended meetings organized and participated also in the project’s workshop, which has a positive impact on the project’s stakeholders at the community level. That is, his presence and active participation have encouraged the participation of communities and enhanced the feeling of ownership over the project undertaken in their village.

The table below highlights the stakeholders, who are engaged in the management of the IW R2R project.

| Stakeholder | Role |
|---|---|
| Ministry of Infrastructure and Sustainable Energy (Water Unit and Architecture) | <ul style="list-style-type: none"> Water quality and quantity monitoring at the Kiribati water reserve areas Design for pigpen |
| Ministry of Health and Medical Service <ul style="list-style-type: none"> Environmental Health Unit Laboratory Unit | <ul style="list-style-type: none"> Conduct water quality monitoring focusing on bacteria test Conduct bacteria water testing |
| Ministry of Fisheries and Marine Resource Development <ul style="list-style-type: none"> Coastal Fisheries Division | <ul style="list-style-type: none"> Responsible for coastal research |
| Ministry of Environment, Lands and Agricultural Development (MELAD) <ul style="list-style-type: none"> Agriculture and Livestock Division Lands Management Division | <ul style="list-style-type: none"> Land-use planning, mapping & GIS |
| Ministry of Women, Youth, and Social Affairs (MWYSA) <ul style="list-style-type: none"> Women Development Division (WDD) | <ul style="list-style-type: none"> Gender mainstreaming including disable communities |
| Ministry of Finance and Economic Development (MFED) <ul style="list-style-type: none"> National Economic Planning Office (NEPO) | <ul style="list-style-type: none"> Mainstreaming of the demonstration project concept into national development strategy for wider uptake and upscaling of the project |
| Kiribati Tourism Authority (KTA) | <ul style="list-style-type: none"> Promote system in their future beautification development projects |
| Kiribati - GEF Small Grants | <ul style="list-style-type: none"> Information on funding windows and requirements for GEF Small Grant |
| USP Kiribati Campus | <ul style="list-style-type: none"> Integrated coastal zone management |

Pursuant to Article V(3), a diagram of the National Project Organisation and Governance will be developed during the national project’s inception. Art. V(4) states that a national coordinating body will be identified for the GEF Pacific National R2R STAR Project. The PCC will act as the Steering Committee for the GEF IW R2R Project as well. Art. 4(6) states that Technical Task Forces may be formed by the PCC, as deemed necessary, with the objective of following up and giving technical assistance on specific national GEF Pacific R2R IW and STAR project technical issues.



Figure. 3: Bonriki Water Treatment & Storage Facility (Photo: S. Sauni, 2019)

Project Results and Achievements

Kiribati's R2R IW project focus is on the local capacity of waste management through effective community engagement, testing of sustainable and cost-effective dry-litter technology (DLT) for reduction of nutrient offload and contamination increased information management and community awareness in support of sustainable waste management.

Kiribati has been behind schedule on project implementation due to the change of scope of the piloted project from the original logframe. The original logframe was developed in consultation with the MISE and purely focused on the water and sanitation pilot, which MELAD-ECD does not have the capacity to implement. The original logframe was then changed along with the yearly work plan. However, the revised logframe was never finalised and adopted for implementation following the departure of the former IWP R2R project manager. In 2019, the Regional R2R PMU visited the country and assisted in the preparation of an MYCWP and a revised logframe.

The table below summarises the results and status of project outcomes and outputs. The results are presented following the results logic.

| Component/ Outcomes/ Outputs | Indicate the appropriate name of the component, the desired outputs, and activities | Indicate the Status of implementation (choose from the following: |
|---------------------------------|---|--|
| Component 1 | Local capacity for sustainable and cost-effective piggery waste management using dry litter technology (DLT) stimulated through effective community engagement and training thereby contributing to reducing nutrient offload and contamination in Buota (North Tarawa) and Bonriki (South Tarawa) water reserves, underground water lenses, and adjacent coastal/marine ecosystem. | |
| Outcome 1.1 | Volunteer piggery waste management networks (VPWMN) are formally established towards increasing community awareness, maintaining, and promoting cleanliness and hygiene status within local communities and forming enabling environment for the enhanced culture of environmental protection | Completed |
| Output 1.1.1 | Volunteer waste management networks (VWMN) established, and its TOR endorsed | Completed VPWMN is established and operational and serves as a bridge between the project team to the communities at the project site. It is comprised of beneficiary households receiving DLT, community leaders, and elected Councillors of Bonriki village. The network has its management team comprised of the Chairperson and the Vice-chair. Their roles are to organize and chair the meetings. The Project Manager plays the secretariat role. |
| Output 1.1.2 | VWMN operational (TOR approved) | Completed - The Network is now active. |

| Component/ Outcomes/ Outputs | Indicate the appropriate name of the component, the desired outputs, and activities | Indicate the Status of implementation (choose from the following: |
|---------------------------------|---|---|
| Outcome 1.2 | <i>Improved donor support for increased householder uptake of dry-litter technology for sustainable piggery waste management</i> | <p><i>Completed</i></p> <p>Option paper outlining funding Stream and Requirements to support wider update of sustainable piggery waste management was developed and endorsed by Stakeholders. the preparation of the paper was led by key stakeholders namely, Ministry of Finance and Economic (MFED) and MWYSA. It was then reviewed through a consultative process through meetings of PSC and endorsed at the retreat held in September 2021. The paper will be made accessible to communities to guide them to access funds related not only to piggery waste management projects but to other environmental projects. OPTION Paper Annex 4</p> |
| Output 1.2.1 | <p>Sustainable options for financing documented and training delivered</p> <p>A brief guideline of financing options is documented. This work was led by MFED and MWYSA in consultation with the TTF.</p> | <p>Completed.</p> <p>A brief guideline of financing options was completed however the training never eventuated.</p> <p>The training was initially organized with the GEF Small Grant Fund office through the National Coordinator in early 2021. The plan is for the project to support the training and organize it with communities in the Bonriki and National Coordinator will deliver a presentation on GEF SGP windows of funding and requirements including the process involves. This was never eventuated because the GEF SGP application form is under review by the board and when the form is ready the team including the National Coordinator is not available to organize and deliver the training between September to December of 2021.</p> <p>There is one piggery waste management project approved for Bonriki by the Kiribati GEF Small Grant Fund in December 2021. This was communicated by GEF SGF National Coordinator to the Project Manager of IW R2R In February this year, Project. The former PM, Waste Disposal Officer of ECD, Community Leader and the National Coordinator of GEF SGF met and agreed to use the fund to up-scale the dry litter technology.</p> <p>The current design of the community has been altered slightly to allow for dry litter technology to be carried out. During that meeting, the MELAD through the MFAT Solid Waste Management project will supply the shredded organic materials produced from the landfill to use in the community pigpen. At the time of writing the report, the pigpen is almost completed.</p> <p>Once completed, the MELAD organized the training with communities on how to manage the pigpen using the operation and maintenance manual, compost making, and undertake monitoring including water quality. The meetings with the community will be organized soon after the project is closed to plan the remaining activities.</p> |

| Component/ Outcomes/ Outputs | Indicate the appropriate name of the component, the desired outputs, and activities | Indicate the Status of implementation (choose from the following: |
|---------------------------------|---|--|
| Outcome 1.3 | <i>National uptake of sustainable pig waste management through community awareness and training</i> | <i>Completed</i> |
| Output 1.3.1 | Technical training workshops conducted | <p>Completed</p> <p>Inception workshop held in October 2020 raises awareness of dry litter technology pigpen and its benefit to communities in Bonriki (South Tarawa). The workshop targets the public attending the workshop. More than 60% of the participant are women.</p> <p>At the first meeting of VWMPN, another awareness raising and training on the technology was conducted in beneficiaries' households after they have been selected following the inception workshop. The training was delivered by a Local Consultant covering the introduction of dry litter technology and its benefits. More than 30% of the participants are women.</p> <p>Another technical training was conducted in March 2021. This is hands-on demonstration training conducted by ALD. More than 60% of the participants are women.</p> <p>The project in collaboration with the MFAT Solid Waste Management project team set up a booth during the 4Rs and Environmentally Friendly local Bazaar held in October 2021. The booth displays a 2x1.5 meters poster of the DLT operational and maintenance manual prepared by the project. The booth also displayed a mini model of a dry litter pigpen constructed by the project.</p> <p>The Senior Agriculture Officer (SAO) of MELAD assisted by to explain to the public how the system works and its benefit. He also explained how to prepare bedding with organic wastes.</p> <p>The awareness workshop is led by the Communication Local Consultant on the health impact of poor pig waste management.</p> |
| Component 2 | Demonstration of innovative approaches to pig waste management through trialing and testing of Dry Litter Technology (DLT) composting systems | |
| Outcome 2.1 | 2.1 Improved domestic pig pen operations catalyzed via piloting of locally appropriate methods for on-site pig waste management. | <p>Completed</p> <p><i>30 pigpens were constructed and installed in Bonriki village close to the water reserve.</i></p> |
| Output 2.1.1 | Appropriate onsite pig waste management piloted. | <p>Completed</p> <p>Two Local Consultants (LC) were engaged to carry out this activity. The first LC (see contract signed) led the design of the pigpen; however, the work was never completed due to poor performance. The contract was terminated. The second LC was engaged to lead the construction of the pigpens with the support of the MELAD handyman. Most of the pigpen (60%) was completed in December 2021, hence is not enough time to monitor.</p> |

| Component/ Outcomes/ Outputs | Indicate the appropriate name of the component, the desired outputs, and activities | Indicate the Status of implementation (choose from the following: |
|---------------------------------|--|---|
| Output 2.1.2 | Dry litter Technology Operation guideline prepared | <p>Completed</p> <p>The dry litter technology pigpen operational and maintenance manual was prepared by the ALD and Communication Officer (local consultant). It is reviewed many times by the members of the TTF and endorsed at the project retreat workshop held in September 2021. Refer to annex 9 – DLT operation and maintenance manual</p> <p>A proper manual has been developed by PCU based on the information prepared above. In addition, the scope of the manual has been expanded to cover other important aspects including the pigpen and compost making. These two sections are prepared in consultation with Environmental Health of MHMS, ALD of MELAD and the License and Enforcement team of ECD.</p> <p>At the time of writing this report, the manual has been reviewed at the ECD level with the ECD to a through half-day work on 27 May 2022.</p> |
| Outcome 2.2 | <i>Environmental and public health are safeguarded via targeted reductions in nutrient and pathogen contamination of coastal areas</i> | Completed |
| Output 2.2.1 | Baseline review conducted | <p>Completed</p> <p>A rough draft environmental water quality monitoring plan was prepared during the Water Quality Training held in May 2020.</p> <p>The training was delivered by SPC RPCU and the Institute of Applied Sciences of the University of the South Pacific (IAS- USP). Ten (10) boreholes and household wells were sampled and tested by the participants as part of their practical exercise. The project treats the level of nutrients and other parameters as a baseline and to be reconsidered and compared against future reading.</p> |
| Output 2.2.2 | Final year evaluation report prepared and endorsed | <p>Completed.</p> <p>The final evaluation report was prepared by RPCU team and Project Manager and reviewed and endorsed by TTF at the final workshop held in North Tarawa.</p> |
| Outcome 2.3 | <i>National capacity for environmental assessment and water quality analysis increased</i> | Completed |
| Output 2.3.1 | A national environmental monitoring plan developed | <p>Completed</p> <p>Draft Water Quality Monitoring plan was developed during the Water Quality Training held in March 2020. The draft plan was then further developed by SPC and PM and reviewed many times by TTF through its series of meetings. The final plan was reviewed and endorsed at the project final workshop held in September 2021.</p> |

| Component/ Outcomes/ Outputs | Indicate the appropriate name of the component, the desired outputs, and activities | Indicate the Status of implementation (choose from the following: |
|---------------------------------|---|---|
| Output 2.3.2 | Implement Environmental monitoring plan. | Completed (and ongoing) The water quality sampling is conducted at the water reserve (Bonriki and Buota) areas confined to bore holes and private wells based on the monitoring plan from April 2020 – July 2021. The sampling and water quality assessment are undertaken on a quarterly basis. The technical report on sampling and monitoring data was reviewed by TTF through its meetings and endorsed at the project retreat workshop held in September 2021. |
| Component 3 | Information management and community awareness increased in support of sustainable and cost-effective animal waste management | |
| <i>Outcome 3.1</i> | <i>Enhanced access to effective information relating to an on-site waste management issue</i> | <i>Completed</i> |
| Output 3.1.1 | Community Outreach Program developed | Completed MYCWP requires two Local Consultants to undertake awareness activities including developing an Outreach Program: activity 3.1.1.1 Consultant to prepare overarching community outreach Programme; and activity 3.1.2.1 Consultant to prepare and additional materials e.g., video printed materials. However, only one (1) Communication Officer (Local Consultant (LC)) was engaged by the project in September 2021 for 2 months due to the capacity gap in Kiribati. Due to limited time left to implement project activities, the TOR was focused on producing outreach materials and conducting awareness programmes and this is agreed by the PCU and RPCU teams. |
| Output 3.1.2 | Training manuals: printed materials and videos developed. | Completed. Pamphlets, posters on dry litter technology (DLT) on the causes and impacts of animal waste and health are prepared by the Local Consultant, which are further reviewed and endorsed by TTF and RPCU communication team. |
| Output 3.1.3 | Community outreach program implemented. | Completed For reasons indicated in output 3.1.1 the Local Consultant prepare an action plan instead of an outreach program based on TOR. |
| <i>Outcome 3.2</i> | <i>Effective management tools developed to support sustainable and cost-effective updates of piggery waste management techniques.</i> | <i>Completed</i> |
| Output 3.2.1 | The operational guideline prepared (research background, convened meeting, workshop to review). | Completed Operational manual completed and endorsed by TTF at the project retreat workshop in September 2021. |
| <i>Outcome 3.3</i> | <i>Improved knowledge base (on what?) and access to effective decision making</i> | <i>Completed.</i> |

| Component/ Outcomes/ Outputs | Indicate the appropriate name of the component, the desired outputs, and activities | Indicate the Status of implementation (choose from the following: |
|---------------------------------|---|--|
| Output 3.3.1 | Database/knowledge management system established | <p>Completed.</p> <p>This activity is supported by another ECD project – which focuses on establishing the Kiribati Environment Information Management System (EMIS). The R2R IW project supports and complements the ongoing operation of the Kiribati EMIS to establish an online database on water quality under the Wastes Management and Pollution Prevention Programme of MELAD ECD. The project funds are utilized to organize meetings with key stakeholders to promote the database.</p> <p>The database is still under development, and it can be accessed at kiribtemis.net. The Kiribati EMIS database will be launched sometime in 2022 and once launched will be accessible to the public.</p> |
| Output 3.3.2 | Database/knowledge management system populated | <p>Completed</p> <p>The project water quality data have been populated into the database. There is also a link to the R2R SPC page.</p> |
| Outcome 3.4 | Diagnostic & SoC reports (i) Diagnostic Analysis (ii) State of Coast report | <p>Completed – The Kiribati Island Diagnostic Analysis report was prepared by Taboia Metutera, a Local Consultant.</p> <p>Not completed – There was no time to commence work on the State of the Coast report.</p> |
| Output 3.4.1 | Diagnostic Analysis & SoC reports completed | Partly completed |
| <i>Outcome 3.5</i> | <i>National R2R Strategic Action Plan or Framework</i> | <p><i>Not completed</i></p> <p>This is yet to be completed due to limited time to undertake. However, this is now being taken up as part of the MELAD ECD Waste Management and Pollution Prevention Programme implementation at the Ministry level. This is about the water quality monitoring and construction of pigpens to reduce the nutrient load from pigpens (and generally human/ animal waste).</p> |
| Output 3.5.1 | SAP or SAF completed | Not completed |

Financial Summary

SPC-R2R Financial Contribution

| Total Allocation | Total Disbursement | Utilization Rate ¹ (Percentage) |
|------------------|--------------------|---|
| USD 200,000 | USD 137,000 | 69% |

Note that the allocation for the Kiribati IW R2R project is US\$200,000, which is earmarked to fund the national project activities set out in the approved costed workplan (MYCWP). There were several Regional IW R2R project-funded activities (disbursed US\$45,000) implemented nationally by the national project. This includes the Diagnostic Analysis work implemented in Kiribati. Therefore, the amount disbursed to Kiribati IW R2R Project as set out above excludes funds for Diagnostic Analysis in Kiribati.

Also, note that the difference in the advance transferred to the country and SPC records is usually due to the exchange rate and the bank transfer fees. These discrepancies are not reflected in the finance section of the narrative report but are accounted for in the financial report.

Finally, the project's total spending is just below the amount disbursed by 92%, and the unutilized fund (US\$13,474.05) will be sent back to SPC, consistent with the provisions set out in the signed MoA. According to SPC records and the financial report submitted, the total spending amounts to US\$168,525.95.

Materialized Co-financing

| Name of Co-financer | Type of Co-financing ² | Amount ³ (USD) |
|-----------------------------|-----------------------------------|------------------------------|
| Government | In-kind | 500,000 |
| LDCF project | In-kind | 58,000 |
| MFAT Solid Waste Management | Cash | 500.00 |

¹ Amount spent divided by amount budgeted/planned multiply by 100.

² Grant or In-kind

³ Total cash and monetized in-kind contributions.

Implementation Progress Ratings

Below is a brief and concise assessment of the results and achievements of the project from the perspective of the recipient. The assessment should endeavour to respond to the following assessment areas:

1. Inputs:

Despite obvious delays in implementation and the impact of COVID-19 pandemic, the support from RPCU has been very efficient ensuring the approved funds are processed and transmitted on time, and the technical support is timely and adequate. For instance, the Project Manager and local consultants received technical assistance from Regional PCU relative to the water quality training, preparation of a revised logframe and MYCWP, design and preparation of project brochures and other knowledge products, and assistance in preparation and complying with reporting commitments. The oversight role of the Steering Committee, the host agency MELAD and inputs from key staff are also recognised with appreciation.

2. Outputs:

The project has eighteen (16) outputs and fourteen (14) of which were successfully completed, and one output each partly completed, and not completed. Therefore, the overall rating of the project relative to outputs can be assessed as "satisfactory." Unfortunately, due to COVID-19, it was not possible for the local consultants to deliver on the two (2) outputs, as well as, delivering on regional work streams relative to completing reports on diagnostic analysis, State of the Coast and Strategic Action Framework.

Equally, there was a delay in generating the outputs which correspond to the construction of DLT piggeries, improved knowledge and understanding through consultations and workshops, as well as monitoring nutrients discharge into the groundwater at Bonriki/Buota Water Reserve. Notwithstanding, the project was able to test the integration of ecosystems across land, water, and coastal management through the innovative technology of dried litter piggery. The initial results of the project produce alarming trends of contamination, particularly in boreholes and wells close to homes of people settling within and close to Water Reserved Land. Ongoing monitoring of the stations is encouraged commencement as well as clearing off habitation and settlement of people illegally on and around reserved land.

Notably, following the review of the logframe and MYCWP, there were changes made to the scope and timeframe, which in turn also altered several outputs. For example, Communication Officer (Local Consultant) under the MYCWP is required to prepare a community outreach program for the project. However, this was slightly changed to focus on producing an action plan. The consultant is expected to prepare awareness materials and roll out the activities within two (2) months.

3. Objectives:

The project has eleven (11) outcomes of which nine (9) were successfully completed, one (1) partly completed, and one (1) not completed. Effectively, the high number of outputs completed led to the successful delivery of outcomes thereby contributing to achieving the project objectives. However, to fully informed of the impact of the R2R intervention and the usefulness of the DLT, ongoing monitoring is required to better understand trends in the reduction of nutrients offloads into groundwater at the Reserve.

Accordingly, several of the beneficially households did not have the chance to operate/trial the pigpen and learn from the process because their pigpens have just completed at the end of the project in December 2021. In addition, the monitoring of the DLT operation by the project team was limited to water quality testing and not the operation of the system due to a delay in installing the pens. Monitoring the operation of systems is important to ensure the system is working properly and assist to reduce nutrient offload and contamination of the environment.

4. Sustainability of the project results:

MELAD has requested to cabinet a budget of \$10,000 to support the water quality monitoring. The paper was raised to Cabinet early this month, June 2022 and the outcome is yet to be conveyed to ECD. With existing capacity, equipment and water quality monitoring plan, the MELAD is confident to continue the water quality testing at the water reserve area and other areas where necessary.

Through the Kiribati Waste Management Strategy 2020-2030, the government is committed to constructing at least 30 Dry litter technology piggens annually. This commitment and effort aimed to reduce the growing amount of organic municipal waste from the households, and at the same time reduce the nutrient load from unsustainable piggery and other animal operations. The new Environment Act 2021, also feature piggery guideline that recognise or adopted the dry litter technology system.

5. Overall Implementation Progress Rating

The Kiribati IW R2R project was able to implement nearly all the components it originally planned, except for the regional project priorities of SoC and SAF. The project underlines the importance of partnerships with other government line ministries, civil societies including INGOs and local communities. The original logframe and plan were revised slightly to align with priorities and remaining timelines. The results and outcomes will continue to be useful in informing future R2R investments and ICM planning in Kiribati.

The project is therefore rated as **satisfactory**.

Project Contributions to the Regional IW R2R Program Outputs and Outcomes

Below are the snapshots of the Kiribati IW R12R project contributions to the Regional Ridge to Reef program components such as:

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 larger Pacific R2R network).

Testing DLT innovative technology demonstrated the successful support for integration of R2R ICM/IWRM/CCA approaches and solutions for island resilience and sustainability. The absolute impacts of reducing nutrient discharge into groundwater and adjacent service water need time and commitment by responsible researchers and communities to continue the momentum of implementing priority adaptation measures to minimise pollution and contamination of groundwater from municipal waste.

The Kiribati IW R2R project contributed to the Regional IW R2R program through stress reduction measures relative to "municipal waste pollution reduction" with its original target of 5775 TN kg/yr (prodoc) which was later revised to an updated target of 1595 TN kg/hr. At the end of project targets, national demonstrations were able to achieve a cumulative reduction of 1059 TN kg/yr.

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

Availability and accessibility to baseline data and results of technical studies along with traditional ecological knowledge would add-value and inform discussion and diagnostic analysis exercises during stakeholder consultations. Participants in diagnostic workshops agreed on the priority issues of water becoming brackish and adverse impacts on drinking water, coastal erosion, the decline in marine resources, and adverse impacts on food crops. The details on these priority issues and other findings are set out in the diagnostic reports listed in the Annex.

More importantly, the Regional IW R2R project would benefit from the Kiribati IW R2R project's contribution relative to the diagnostic analysis for integrated coastal management providing an opportunity for stakeholders to contribute to the prioritization and scaling up key R2R/ICM/IWRM/CCA reforms and investments in Kiribati, as well in other PICs.

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

The Kiribati IW R2R project advocated support for multi-stakeholder leader roundtable networks established for strengthened 'community to cabinet' in R2R/ICM/IWRM/CCA. For instance, the Project Steering Committee is well represented by a range of stakeholders, several of who are senior government officials, civil society, and INGO representatives, including majors and community champions. The committee engages in policy discussion and decision-making relative to project implementation and outcomes of community activities at the grassroots levels through training workshops, group discussion, and construction of DLT pipings. In turn, the project outcomes and decisions were reported to the cabinet through the responsible minister for the environment. The project results were also reported through the host agency and PMU to the Regional Steering Committee.

Moreover, the project established the Volunteer Piggery Waste Management Networks (VPWMN) as a forum to promote a network for information and knowledge exchange on integrated coastal management including waste pollution, among members of the community and the government. This platform creates a comfortable environment for local communities to communicate directly to the government about their priority needs related to water and sanitation. These efforts contributed immensely to the Regional IW R2R project raising awareness and encouraging broad stakeholder and community participation in all stages of development projects aimed to address issues on water and sanitation as well as integrated coastal management along the land-sea continuum.

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

2.1 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.

The Kiribati IW project results and lessons strengthen national and local capacities for R2R/ICM/IWRM approaches. The local participants in the water quality training and demonstration on the use of test kits to collect /analyse data, and report results, provided the basis for improved skillset and understanding. Kiribati delegation to regional meetings and workshops also benefited and therefore contributed to the enhancement of R2R ICM/IWRM management capacities. Kiribati missed out in the post graduate R2R course in sustainable development that was delivered at James Cook University and intend to fully participate in future opportunities.

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

While there bounds to be turnover in local government officials and R2R expertise, MELAD will continue to train new staff and carry out awareness workshops relative to R2R and integrated coastal management, ICM/IWRM/CCA. These efforts include MELAD incentive structures for joint and partnership work with other line ministries like fisheries and infrastructure/water, civil society, NGO/INGO, and communities including youth/church/women groups.

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

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

As reported earlier, the project was not able to produce the Strategic Action Framework (SAF) and Plan (SAP) despite initial plans, logistics and financial resources being readily available. Accordingly, the plan was that the same local consultant engaged with diagnostic analysis work and state of the coast report will be also hired to work on the SAF and SAP. However, the information captured in the diagnostic reports provides the basis to envision the priority policy interventions and actions needed to address priority issues set out in that report. This information was used and the formulation of the Regional Declaration for Mainstreaming R2R2 which was approved by RSC in January 2022.

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

See details in 1.3 above

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

Below are the snapshots of the contribution of the national demonstration project contributions to the GEF Focal Areas such as International Waters, Biodiversity Conservation, Land Degradation, Sustainable Forest Management, and Climate Change Adaptation.

GEF Focal Areas

1. International Waters

The Kiribati IW R2R project tested the innovative dry litter technology among other measures to reduce nutrient offloads to groundwater lenses and aquifers, as well as nearby surface waters. Therefore, the project results were expected to showcase the utility of DLT in the reduction of waste thereby minimising the risk of polluting and contaminating groundwater lenses and protecting coastal seawater from land-based contamination activities. The project aims to reduce 955 TN per year through the construction of 30 dry litter technology pigpens. After the construction of the 30 pigpens, there is not sufficient time allowed to monitor water quality and draw a conclusion about whether this target is achieved or not. The final assessment report confirms the 5% nutrient reduction load is not achieved noting the need for ongoing monitoring of DLT, use of organic compost to reduce nutrient load into the environment, awareness raising and training.

Contribution to the GEF Focal Area on International Waters is through objective IW 1 – strengthening blue economy opportunities, and objective IW 3 – enhancing water security in freshwater ecosystems. The Kiribati IW R2R project contributed to the Regional IW R2R program through Municipal Waste Pollution Reduction with an original target of 5775 TN kg/yr (prodoc) which was later revised to an updated target of 1595 TN kg/hr. At the end of project targets, national demonstrations were able to achieve a cumulative reduction of 1059 TN kg/yr.

2. Biodiversity Conservation

The introduction of dry litter technology offers a cost-effective option for reducing water pollution, as it contains waste from existing pig pens and therefore prevents the percolation of waste into underground water resources and nearby coastal ecosystems. The Kiribati IW R2R project also contributed to GEF Focal Area of biodiversity conservation as follows: -

- i The compost from testing DLT is useful for home gardening thereby assisting in food and water security; and
- ii The Bonriki/Buota Water Reserve is legally restricting settlements, and the exploitation of resources including indiscriminate harvesting of trees, burials, and other human activities.

3. Sustainable Forest Management

NA

4. Land Degradation

NA

5. Climate Change Adaptation

Sustainable Development Goals (SDGs)

| SDG | Project contributions |
|---|---|
| SDG 1 – No poverty | |
| SDG 2 – Zero hunger | Organic home gardening using compost |
| SDG 3 – Good health and well-being | Water and sanitation knowledge materials, demonstration, and construction of innovative dry-litter technology (DLT) pigpens |
| SDG 4 – Quality education | Knowledge products and materials on waste management and biodiversity conservation |
| SDG 5 – Gender equality | Gender inclusive approach during project implementation – workshops, committees, training |
| SDG 6 – Clean water and sanitation | Target is to reduce 955 TN kg per year |
| SDG 12 – Responsible production and consumption | |
| SDG 13 – Climate change | Protection of groundwater lenses and aquifers |
| SDG 14 – Life below water | |
| SDG 15 – Life on land | |
| SDG 17 – Partnerships for the goals | |

Special Themes

Gender Mainstreaming

Kiribati has already made good progress towards mainstreaming gender equality in responsibilities and opportunities where most of the high post in the government are held by women like Secretary to Cabinet to many more. However, accordingly to the census report 2015, it shows that most women do not have the same opportunity as men to take on employment, due to their greater share of home-based duties and responsibilities for children. Thus, there are efforts made by the Kiribati IW R2R project to develop skills and ensure equal access of opportunity for women and youth in the planning stage and implementation of project activities.

A good illustration of gender inclusion in the project is the composition of project committees. In the Project Steering Committee, women consist of more than 40% of the members. The PSC is chaired by a woman Chair who is also the Permanent Secretary of MELAD. Similarly, in the Technical Task Force, women representation was 60%, and is chaired by a woman Director of ECD. This trend mirrors women representation in senior positions of the government.

Planning and decision making

Planning and decision making is dependent on the quality and up-to-date information availability and accessibility. There are at least three levels of planning and decision making of the Kiribati IW R2R project – regional, national and community. The Regional Steering Committee (RSC) provides the umbrella oversight of the Regional IW R2R child project, and direct bearing to national project demonstrations. The Kiribati IW R2R project is under the oversight of its Project Steering Committee. At the project site of Bonriki/Buota Water Reserves, there are also community groups that support project implementation.

Generally, there are inter-linkages and interrelationships within and between the 3-levels of authority and therefore decisions tend to flow along the same lines.

Training and capacity building

As above.

Lessons Learned (Innovations and Catalytic Impacts)

Innovative aspects

Involvement of Elected Councillors in the planning and decision making

The involvement of leaders and chiefs or any other influential figures in society on high-level decision-making authorities and committees is considered best practice.

For instance, the Kiribati IW R2R project engaged a Bonriki Village Councillor by the project in the community consultation has been instrumental to encourage the participation of communities in Bonriki. The Councillor participated in project workshops and meetings and assisted with facilitation including guiding the discussion and focusing on the agenda. There are instances where communities asked the project team during workshops and consultations sensitive questions related to the compensation for water resources extracted from Bonriki. The councillor would intervene for the project team and adequately and politely respond to the questions.

R2R Visibility in Public Events - MELAD Week 2021

Actions speak louder than words, and visibility is key to improved knowledge and broader awareness and understanding. The Kiribati IW R2R used the opportunity of national public events to showcase R2R in partnership with other closely linked projects.

In October 2021, MELAD Week was live with celebrations and the IW R2R project team, and the Solid Waste project (MFAT) set up a booth. The MELAD week intended to showcase the benefit of the system to the public and sell the organic chips from the solid waste project. The MFAT project printed a 2x1.5 meters banner of the dry litter piggery operational manual and displayed it at the booth. The IW R2R project constructs a small model of the dry litter pigpen. The project also collaborates with the Agriculture and Livestock Division which explains and demonstrates how the system works and how to prepare to bed for pigpen using organic chips. The display and the demonstration attract a lot of audiences. Following the MELAD Week, many communities approached the MELAD and asked about the system and how to construct them.

Practical Use of Partnerships & Networks - Volunteer piggery waste management networks (VPWMN)

It takes 'plenty' to successfully influence and enable transformation change in society. No doubt, the use of partnerships and networks are useful modalities supporting advocacy and power tools in 'winning' behavioural change.

The Kiribati IW R2R project established the "Volunteer Piggery Waste Management Network" of like-minded women and men in local communities to use such a platform to raise and inform the government of their priority needs related to water and sanitation. The network was successful with a high number of people turning up to forum meetings and workshops. Members of the Network were very comfortable discussing their opinions. There is a plan for ECD to strengthen the capacity of members so that they also can assist (voluntary) to enforce the Environment Act related to waste management and coastal protection.

External Technical Back-stopping Services to the PCU Team amidst COVID-19

Where there is inadequate technical capacity in the country, it is to seek assistance and help from abroad, particularly from the RPCU. The Kiribati IW R2R project suffered from the impacts of COVID-19 and the project experienced costly delays. During this time, the RPCU team continued to assist virtually and supported the country team and local consultants to progress implementation despite of the challenges. The RPCU team assisted in the preparation of consultancies and vetting of applications conducted inception meetings and

reviews and assisted in rewriting draft reports and other knowledge products. There were guidance and concept notes provided, and templates prepared for technical and other project reporting.

Project Revisitation and Planning at the Retreat – Is the Kiribati IW R2R Project on track?

Regular planning and decision-making are required to ensure the project remains on track, if not, identify priority root causes and agree on remedial actions. It is important to work within the boundary of the approved project deliverables. This may include sequencing and scheduling of project outputs and supporting activities that remain practically possible to deliver on the outcomes and goals within the remaining timelines.

The PCU and members of the Technical Taskforce spent two (2) days of retreat critically reviewing major outputs of the project particularly the report, guidelines, awareness materials, etc. Most of the reports and materials to be reviewed are already shared with stakeholders many weeks back without any feedback from them. The outcome of the retreat is satisfactory, the participants managed to complete a review of all the documents namely, the dry litter piggery manual, the Final Water Quality Monitoring Report, alternative financing guideline, and the diagnostic report in 2 days. For the first time, much information was shared by the stakeholders during the discussion. This includes the provision of data and reports which are important in the review of some of the technical reports.

Catalytic impacts

The IW R2R project innovative pilot project has been successful at catalyzing change through the establishment of dry litter pigpens at the water reserve and the erection of the signboard at the main road going to Bonriki (project site). The GEF Small Grant Programme (GEF SGP) through National Coordinator informed the IW R2R project team of one concept note related to piggery waste management being approved by the GEF SGF board in September 2021. The proposal came from the local communities themselves that do not receive support from the IW R2R project. The GEF SGP National Coordinator has linked the Project Manager with community leader, Mr. Tiirua Antonio to work with them on the dry litter technology concept. Later, in December 2021 the project was approved by GEF SGP. The project manager had been in contact with the community leader and shared copies of dry litter posters and the operational manual.

Behavioral change and attitudes of the I-Kiribati toward a new innovative activity on dry litter pigpen to safeguard the environment from pollution. Many communities have approached the MELAD through meetings and consultation and asked for support to construct their pigpen. The good outcomes of the project pilot project and the water quality final assessment report has been instrumental to suggest new provisions of the new Environment Act 2021 related to water and sanitation (particularly nutrient from pigs).

The new Environment Act 2021 has just recently been endorsed by parliament in September 2021 has new provisions that prohibit the erection of piggery within water reserves and feature the National pigsty guideline. This guideline is under development, and it will be based on the IW R2R project piggery operation and maintenance manual has been expanded to include requirements for site selection for the pigpen and compost making.

The project has initiated this discussion with the Environment Enforcement Team of ECD. There is interest by ECD to finalize this pigsty guideline by this year (2022) before the enforcement commences after the gracing period of the new act ends. Related to this, the ECD has incorporated an environment license system requirement for commercial piggery operations to follow the dry litter technology concept (including design) to reduce odor and water pollution.

The good partnership of the IW R2R project with Solid Waste Management Stakeholders promoted the dry litter piggery system as the best solution to manage organic waste at the household level. Organic waste made up more than 50% of the waste stream generated from households and is mainly vegetative matter). The recent Kiribati Waste Management Resource and Recovery Strategy 2020 -2030 recognized dry litter piggery as one solution to organic waste management. In the strategy, it has committed to establishing at least 30 dry litter systems for demonstration and practical use in the Bonriki and Buota communities.

Annexes

| Annexes | Title of Kiribati IW R2R Project Documents |
|----------------|---|
| Annex 1 | <p>Project Legal Documents</p> <p>Signed SPC/Kiribati Memorandum of Agreement – IW R2R Project https://www.pacific-r2r.org/resource-library/kiribati-spc-moa</p> <p>Extension 1 https://www.pacific-r2r.org/sites/default/files/2022-07/Kiribati_30June2021_signed%20both%20Parties%20-%20Extension%20%231.pdf</p> <p>Extension 2 https://www.pacific-r2r.org/sites/default/files/2022-07/Kiribati_30Sept2021_signed%20both%20Parties%20-%20Extension%20%232.pdf</p> <p>Extension 3 https://www.pacific-r2r.org/sites/default/files/2022-07/Kiribati_30%20Nov%202021%20signed%20by%20both%20parties%20-%20Extension%20%233.pdf</p> <p>Extension 4 https://www.pacific-r2r.org/sites/default/files/2022-07/Kiribati_30Dec2021_signed%20both%20Parties%20-%20Extension%20%234.pdf</p> |
| Annex 2 | <p>GEF Pacific R2R Programme Kiribati National R2R Programme Document https://www.pacific-r2r.org/sites/default/files/2020-03/Kiribati.pdf</p> |
| Annex 3 | <p>Kiribati National International Water R2R Project Logframe https://www.pacific-r2r.org/sites/default/files/2022-07/FINAL.Kiribati%20IW%20R2R%20Logframe.071119.pdf</p> <p>Kiribati National International Water R2R Project MYCWP https://www.pacific-r2r.org/resource-library/final-kiribati-iw-r2r-mycwp</p> |
| Annex 4 | <p>Term of References</p> <p>Project Steering Committee (PSC)</p> <p>Technical Task Force (TTF)</p> |
| Annex 5 | <p>Island Diagnostic Analysis Report, Kiribati IW R2R Project https://www.pacific-r2r.org/sites/default/files/2022-02/IDA_KI_03_Island%20Diagnostic%20Analysis%20Report%20for%20Kiribati_high%20res%20%282%29.pdf</p> |
| Annex 6 | <p>Site Diagnostic Analysis Report for Bonriki & Buota in South Tarawa, Kiribati IW R2R Project https://www.pacific-r2r.org/sites/default/files/2022-04/SDA_KI_06_Bonriki%20Site%20Diagnostic%20Report_updated%20%282%29.pdf</p> |
| Annex 7 | <p>Diagnostic Analysis Workshop Report, Kiribati IW R2R Project https://www.pacific-r2r.org/sites/default/files/2022-02/MISC_KI_04_Kiribati%20Diagnostic%20Analysis%20Workshop_high%20res%20%281%29.pdf</p> <p>Diagnostic Analysis Inception workshop report</p> |
| Annex 8 | <p>Monitoring Plan & Reports, Kiribati IW R2R Project</p> <p>Bonriki & Buota Water Reserves Water Quality Sampling/ Monitoring Data April 2020-July 2021 https://www.pacific-r2r.org/sites/default/files/2021-10/Kiribati_Water%20Quality%20Sampling%20Monitoring%20Report.pdf</p> <p>Bonriki and Buota Reserves Water Quality Sampling/ Monitoring Pan https://www.pacific-r2r.org/sites/default/files/2020-08/IWR2R_Water_Quality_Monitoring_Plan_Kiribati.pdf</p> <p>Kiribati Water Quality Monitoring Report https://www.pacific-r2r.org/sites/default/files/2020-06/Kiribati_Water_Quality_Training_Report.pdf</p> <p>Water Quality Training Workshop report https://www.pacific-r2r.org/sites/default/files/2020-06/Kiribati_Water_Quality_Training_Report.pdf</p> |

| Annexes | Title of Kiribati IW R2R Project Documents |
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| Annex 9 | Piggery waste management in Kiribati https://www.pacific-r2r.org/sites/default/files/2020-07/workshop-summary-report-24-26.pdf |
| Annex 10 | Posters & Signboards Kiribati Portable Dry Litter Pigpen https://www.pacific-r2r.org/sites/default/files/2021-08/Kiribati%20Portable%20Dry%20Litter%20Pigpen_Poster.pdf Poster – GEF Pacific Ridge to Reef International Waters Project – MELAD, Kiribati https://www.pacific-r2r.org/sites/default/files/2021-08/Kiribati_R2R_IW_Signboard_Final_0.pdf Kiribati IW R2R Signboard Water Reserve Map https://www.pacific-r2r.org/sites/default/files/2021-08/Kiribati_R2R_IW_Signboard_Final_0.pdf |
| Annex 11 | Meeting Reports Inception workshop report https://www.pacific-r2r.org/sites/default/files/2022-07/INCEPTION%20REPORT%20-%20FINAL.pdf Progress Report 2020 https://www.pacific-r2r.org/sites/default/files/2020-03/Project_Progress_Kiribati.pdf Presentation to IW R2R Project Steering Committee https://www.pacific-r2r.org/partners/member-countries/kiribati First Meeting of VWMPN 2021 https://www.pacific-r2r.org/sites/default/files/2022-07/1st%20meeting%20of%20VPWMN%202021.pdf Third Meeting of TTF 2020 https://www.pacific-r2r.org/sites/default/files/2022-07/3rd%20meeting%20of%20TTF_Sept2020.pdf Special Meeting of TTF 2021 https://www.pacific-r2r.org/sites/default/files/2022-07/Special%20meeting%20of%20TTF%20mtg%20minute_2021_0.pdf Bilateral Meeting with MISE on DLT pigpen design 2020 https://www.pacific-r2r.org/sites/default/files/2022-07/Bilateral%20meeting%20with%20MISE%20on%20the%20dry%20litter%20piggery%20pigpen%20design%202020.pdf MELAD Update Meeting on IW R2R project 2020 https://www.pacific-r2r.org/sites/default/files/2022-07/MELAD%20update%20meeting%20on%20R2R%20International%20Waters%20project%202020.pdf Bonriki Community Consultation Report 2021 https://www.pacific-r2r.org/sites/default/files/2022-07/Bonriki%20Community%20Consultation%20report_2021.pdf Meeting minutes MWYSSA & MIA 2021 https://www.pacific-r2r.org/sites/default/files/2022-07/meeting%20minute%20MWYSSA%20%26%20MIA_2021.pdf DLT operation and maintenance manual |
| Annex 12 | Notices Advertisement – diagnostic report development https://www.pacific-r2r.org/sites/default/files/2022-07/Advertisement_Diagonostic_report_development.pdf Option Paper for funding streams supporting Uptake of Piggery Waste Management in Kiribati https://www.pacific-r2r.org/sites/default/files/2022-07/Alternative%20financing_190721FINAL.pdf Demonstration Training https://www.pacific-r2r.org/sites/default/files/2022-07/REV_demonstration%20trainig%20on%20construction%20and%20installation%20of%20DLT%20pigpen_2021.pdf Certificate of Attendance – IW R2R Water Quality Training https://www.pacific-r2r.org/sites/default/files/2022-07/Certificate_of_Attendance_Kiribati.pdf PowerPoint presentation – inception meeting https://www.pacific-r2r.org/sites/default/files/2022-07/ppt_Bonriki_inception_r2rproject_2021.pdf |

| Annexes | Title of Kiribati IW R2R Project Documents |
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| Annex 13 | <p><u>DLT Designs & Cost Estimates</u></p> <p>Technical Design DLT</p> <p>https://www.pacific-r2r.org/sites/default/files/2022-07/302001%20-%20MELAD%20ECD%20R2R%20Pig%20Pen%20%281%29.pdf</p> <p>Estimate for Constructing a DLT pigpen</p> <p>https://www.pacific-r2r.org/resource-library/estimate-pig-pen</p> |
| Annex 14 | <p>Brief Report – Site Demonstration Training on Construction & Installation of DLT Pigpen with Community in Bonriki</p> <p>https://www.pacific-r2r.org/sites/default/files/2022-07/REV_demonstration%20trainig%20on%20construction%20and%20installation%20of%20DLT%20pigpen_2021.pdf</p> |
| Annex 15 | <p>Kiribati IW R2R Project page</p> <p>https://www.pacific-r2r.org/partners/member-countries/kiribati</p> |

