

Pacific Island Countries

**Japanese Technical Cooperation Project
for Promotion of Regional Initiative on
Solid Waste Management in Pacific Island
Countries Phase II (J-PRISM II) (Group 1)**

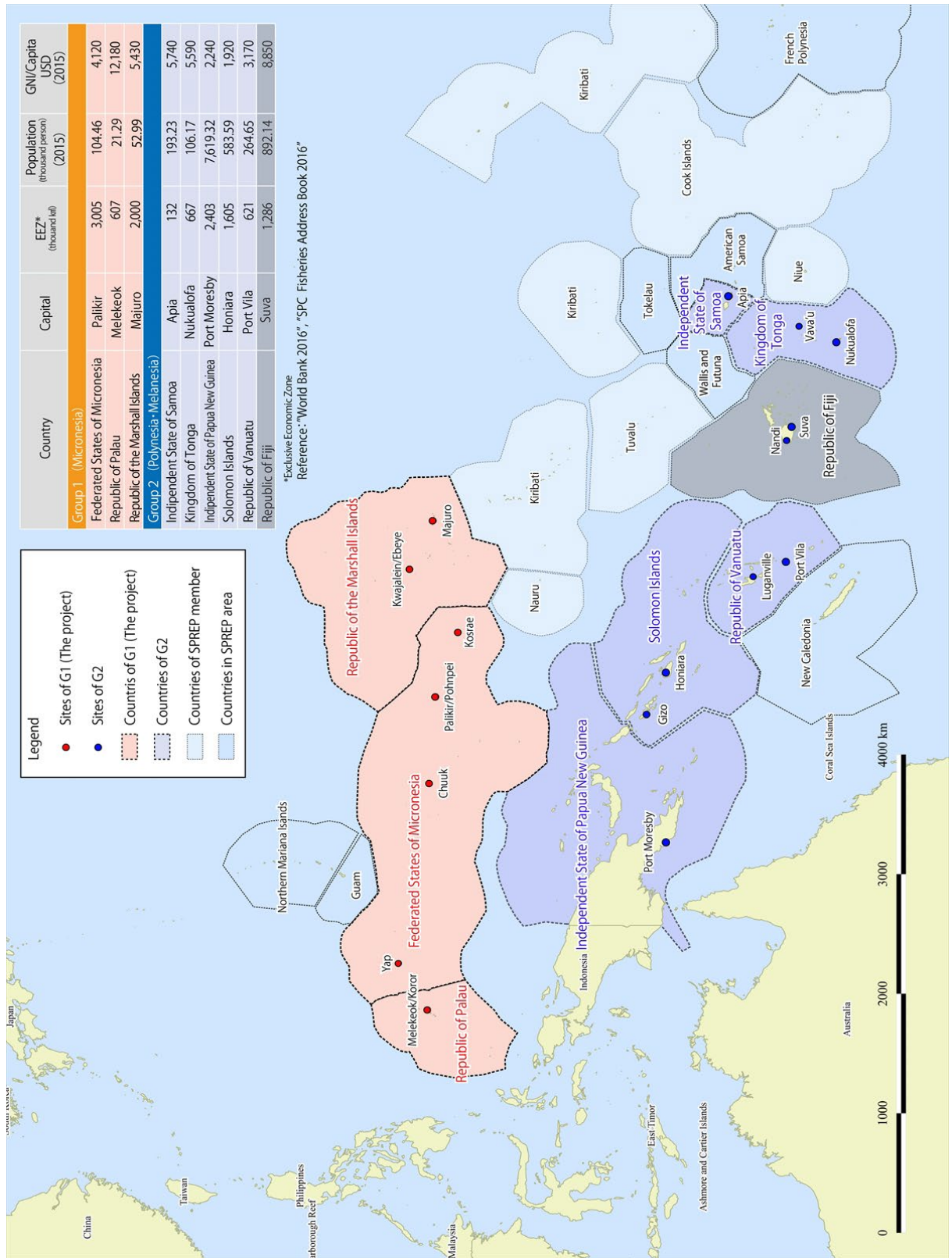
Project Completion Report

September 2022

Japan International Cooperation Agency(JICA)

**Kokusai Kogyo Co., Ltd.
EX Research Institute Ltd.**

GE
JR
22-098



Target area of the Project

Table of Contents

1	Project Overview	1
1.1	Background	1
1.2	Scope	1
1.3	Implementation Schedule	2
1.4	Objectives	3
1.4.1	Regional Cooperation Project	3
1.4.2	Project for Target Countries.....	3
1.5	Inputs from JICA (Dispatch of Experts)	5
2	Republic of Palau (Palau)	6
2.1	Project Flow Chart.....	6
2.2	Achievement of Outputs.....	7
2.3	Achievement of Project Purpose	12
2.4	Recommendations to Achieve Overall Goal	13
2.5	Means and Lesson Learnt from the Project.....	13
3	The Federated States of Micronesia (FSM)	15
3.1	Federal State	15
3.1.1	Project Flow Chart	15
3.1.2	Achievement of Outputs	16
3.1.3	Achievement of Project Purpose.....	17
3.1.4	Recommendations to Achieve Overall Goal.....	17
3.1.5	Means and Lesson Learnt from the Project	18
3.2	Yap State (Yap)	19
3.2.1	Project Flow Chart	19
3.2.2	Achievement of Outputs	20
3.2.3	Achievement of Project Purpose.....	25
3.2.4	Recommendations to Achieve Overall Goal.....	25
3.2.5	Means and Lessons Learnt from the Project.....	25
3.3	Chuuk State (Chuuk)	27
3.3.1	Project Flow Chart	27
3.3.2	Achievement of Outputs	28
3.3.3	Achievement of Project Purpose.....	30
3.3.4	Recommendations to Achieve Overall Goal.....	30
3.3.5	Means and Lesson Learnt from the Project	31
3.4	Pohnpei State (Pohnpei)	32
3.4.1	Project Flow Chart	32
3.4.2	Achievement of Outputs	33
3.4.3	Achievement of Project Purpose.....	36

3.4.4	Recommendations to Achieve Overall Goal.....	37
3.4.5	Means and Lesson Learnt from the Project	37
3.5	Kosrae State (Kosrae)	38
3.5.1	Project Flow Chart.....	38
3.5.2	Achievement of Outputs	39
3.5.3	Achievement of Project Purpose.....	44
3.5.4	Recommendations to Achieve Overall Goal.....	44
3.5.5	Means and Lesson Learnt from the Project	44
4	Republic of Marshal Islands (RMI)	47
4.1	Project Flow Chart.....	47
4.2	Achievement of Outputs.....	48
4.3	Achievement of Project Purpose	52
4.4	Recommendations to Achieve Overall Goal	52
4.5	Means and Lesson Learnt from the Project.....	53
ANNEX A	Republic of Palau	
A-1	List of relevant information	
A-2	Plan of Operation	
A-3	PDM	
ANNEX B	The Federal States of Micronesia	
B-1	List of relevant information	
B-2	Plan of Operation	
B-3	PDM	
ANNEX C	Republic of Marshal Islands	
C-1	List of relevant information	
C-2	Plan of Operation	
C-3	PDM	
ANNEX D	Capacity Assessment	
ANNEX E	Record of Final Joint Coordinating Committee Meeting	
ANNEX F	Good Practices	
ANNEX G	Country Profile	
ANNEX H	J-PRISM II Activity Highlight	

Abbreviations

Abbreviations	Official name
3R	Reduce, Reuse, Recycle
ADB	Asian Development Bank
AFD	Agence Française de Développement
AUD	Australian Dollar
CDL	Container Deposit Legislation Container Deposit Levies
CEO	Chief Executive Officer
CSP	Clean School Program
C/P	Counterpart
EDF	European Development Fund
EIA	Environmental Impact Assessment
EPR	Extended Producer Responsibility
EU	European Union
E-waste	Electrical and electronic waste
GDP	Gross Domestic Product
GEF	Global Environment Facility
GNI	Gross National Income
GW	Green Waste
ICCAI	International Climate Change Adaptation Initiative
IEE	Initial Environmental Examination
IFC	International Finance Corporation
ILO	International Labor Organization
JCC	Joint Coordination Committee
JICA	Japan International Cooperation Agency
JOCV	Japan Overseas Cooperation Volunteers
J-PRISM	Japanese Technical Cooperation Project for Promotion of Regional Initiative on Solid Waste Management in Pacific Island Countries
KAJUR	Kwajalein Atoll Joint Utility Resource
KALGOV	Kwajalein Atoll Local Government
M/M	Minutes of Meeting
MALGOV	Majuro Atoll Local Government
MOU	Memorandum of Understanding
MRF	Material Recovery Facility
NGOs	Non-Governmental Organizations
NSWMP	National Solid Waste Management Plan
NSWMS	National Solid Waste Management Strategy

Abbreviations	Official name
NZAID	New Zealand Agency for International Development
OJT	On the Job Training
PALM	Pacific Islands' Leaders Meeting
PDM	Project Design Matrix
PET	Polyethylene terephthalate
PIC	Pacific Island Countries
PICTs	Pacific Island Countries and Territories
PIF	Pacific Islands Forum
PO	Plan of Operation
POPs	Persistent Organic Pollutants
PPP	Public Private Partnership
PRIF	Pacific Regional Infrastructure Facility
PS	Permanent Secretary
R/D	Record of Discussions
SPC	South Pacific Commission
SPF	South Pacific Forum (currently: PIF, Pacific Islands Forum)
SPREP	The Secretariat of the Pacific Regional Environment Programme
SV	Senior Volunteer
SWM	Solid Waste Management
TOR	Terms of Reference
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
USAID	US Agency for International Development
USD	United States Dollar
WB	World Bank
WCP	Waste, Chemicals and Pollutants
WHO	World Health Organization
BPW	Bureau of Public Works
BPW-SWM	Bureau of Public Works – Solid Waste Management
EQPB	Environmental Quality Protection Board
KSG	Koror State Government
KSG-SWM	Koror State Government – Solid Waste Management
MPIIC	Ministry of Public Infrastructure, Industries and Commerce
DECCEM	Department of Environment, Climate Change and Emergency Management
DPW&T	Department of Public Works and Transportation
DT&I	Department of Transportation and Infrastructure
DT&PW	Department of Transportation and Public Works
EPA	Environmental Protection Agency

Abbreviations	Official name
FSM	Federated States of Micronesia
KIRMA	Kosrae Island Resource Management Agency
OEEM	Office of Environment & Emergency Management
OIA	Office of Insular Affairs
PWMS	Pohnpei Waste Management Service
T&I	Office of Transportation and Infrastructure
EPA	Environmental Protection Authority
KADA	Kwajalein Atoll Development Agency
KAJUR	Kwajalein Atoll Joint Utility Resource
KALGOV	Kwajalein Atoll Local Government
MALGOV	Majuro Atoll Local Government
MAWC	Majuro Atoll Waste Company
MEC	Marshal Energy Company
MPW	Ministry of Public Works
MWIU	Ministry of Works, Infrastructure and Utility
OCS	Office of Chief Secretary
OEPPC	Office of Environmental Planning and Policy Coordination
RMI	Republic of the Marshall Islands

1 Project Overview

1.1 Background

Over several decades, waste has become one of the major concerns for small island countries in the Pacific region, particularly because these countries have faced severe challenges such as the increasing volume and changing characteristics of urban and industrial wastes. Such unique constraints as geographical isolation, limited resources, economic scale and social background have made solid waste management (SWM) more difficult for Pacific island countries.

These countries still need to improve their technical capacities to respond to the challenges such as maintaining disposal sites, familiarizing with 3R practices, acquiring financial resources on SWM and formulating or revising national strategies to build sustainable implementing frameworks.

This Project, J-PRISM II (hereinafter, the Project), the follow-up project to J-PRISM I, provides technical assistance to the Pacific region to strengthen capacity for sustainable solid waste management through implementation of the Pacific Regional Waste and Pollution Management Strategy 2016-2025 (hereinafter, Cleaner Pacific 2025; or CP 2025).

1.2 Scope

a. Target Countries

Nine countries in the Pacific region: Republic of Palau, The Federated States of Micronesia (FSM), Republic of Marshall Islands (RMI), Independent State of Papua New Guinea, Solomon Islands, Republic of Vanuatu, Republic of Fiji, Kingdom of Tonga, and Independent State of Samoa. **Group 1 (G1) countries are Palau, FSM and RMI.**

b. Target Waste

Municipal solid waste such as domestic/commercial waste shall be targeted in principle.

c. Counterpart Organization

	Name of Region/Country	C/P Organization
—	Pacific region	<u>Secretariat of the Pacific Regional Environment Programme (SPREP) Waste Management and Pollution Control</u>
Micronesia (Northern area of the Project)		
1	Republic of Palau	<u>Ministry of Public Infrastructure, Industries and Commerce (MPIIC), Bureau of Public Works-Solid Waste Management (BPW-SWM), Koror State Government-Solid Waste Management (KSG-SWM)</u>
2	The Federated States of Micronesia	<u>Office of Environment & Emergency Management (OEEM), Yap: Environmental Protection Agency (EPA)/Department of Public Works and Transportation (DPW&T) Chuuk: Environmental Protection Agency (EPA)/Department of Transportation and Public Works (DT&PW) Pohnpei: Environmental Protection Agency (EPA)/Office of Transportation and Infrastructure (T&I)</u>

1.4 Objectives

1.4.1 Regional Cooperation Project

Outline of regional cooperation project is as follows according to the PDM (ver.1) revised on 26th of October 2017.

Overall Goal	Sustainable management of solid waste in the Pacific region is enhanced based on Pacific Regional Waste and Pollution Management Strategy 2016-2025 (Cleaner Pacific 2025).
Project Purpose (Integrated)	Human and institutional capacity base for sustainable Solid Waste management in the Pacific Region is strengthened through implementation of the "Cleaner Pacific 2025".
Project Purpose (Regional)	Implementation of the Cleaner Pacific 2025 on solid waste management is timely monitored and supported based on Pacific to Pacific cooperation.
Output 1	Monitoring mechanism for solid waste management in line with Cleaner Pacific 2025 is strengthened.
Output 2	Regional cooperation within the Pacific is organized and promoted by utilizing regional human resource and sharing lessons learnt in the region.
Output 3	Regional capacity of disaster waste management is strengthened.
Output 4	Practical and sustainable 3R+Return system is enhanced.

1.4.2 Project for Target Countries

Project purpose and output are set for each country and state in the Project as follows in addition to overall goal and integrated project purpose. The contents below, other than Palau, refer to the updated PDMs (ver.1), which were modified in 1st JCC Meeting in each country; held on 28th of September in FSM, 2nd of October in RMI. The contents of Palau refer to the original PDM (ver.0).

a. Palau

Project Purpose	With a view to commencement of a new landfill site, a solid waste management system is improved.
Output 1	New NSWMS and its action plan prepared in line with the Cleaner Pacific (2016-2025) are officially submitted to the Minister.
Output 2	Good practices of solid waste management /3R are promoted in country and the region.
Output 3	Waste collection is improved in 10 states of Babeldaob Island and in Koror.
Output 4	Transition from M-dock landfill to a new landfill is appropriately carried out.

b. FSM

b.1 Federal State

Project Purpose	Support to creation of solid waste management system in each four state is provided.
Output 1	Support from OEEM to formulate SSWMS is provided to each state.
Output 2	Good practices of solid waste management /3R are promoted in country.

b.2 Yap

Project Purpose	Creation of solid waste management system is promoted.
Output 1	New SSWMS and its action plan prepared in line with the Cleaner Pacific (2016-2025) are developed.
Output 2	Good practices of solid waste management /3R are promoted in country and the region.
Output 3	Waste collection is improved in Yap Island.

b.3 Chuuk

Project Purpose	Creation of solid waste management system is promoted.
Output 1	New SSWMS and its action plan prepared in line with the Cleaner Pacific (2016-2025) are developed.
Output 2	Good practices of solid waste management /3R are promoted in the country and the region.
Output 3	Effective CDL implementation mechanism is explored by relevant authorities.

b.4 Pohnpei

Project Purpose	Creation of solid waste management system is promoted.
Output 1	New SSWMS and its action plan prepared in line with the Cleaner Pacific (2016-2025) are developed.
Output 2	Good practices of solid waste management /3R are promoted in the country and the region.
Output 3	Effective CDL implementation mechanism is explored by relevant authorities.

b.5 Kosrae

Project Purpose	Creation of solid waste management system is promoted.
Output 1	New SSWMS and its action plan prepared in line with the Cleaner Pacific (2016-2025) are developed.
Output 2	Good practices of solid waste management /3R are promoted in the country and the region.
Output 3	Waste collection is improved in Kosrae.

c. RMI (Majuro and Ebeye)

Project Purpose	Creation of solid waste management system is promoted.
Output 1	Policy documents necessary to improve SWM system are officially submitted to the relevant authorities. (Note) Policy documents here means i) SWM Plan for MAWC, ii) SWM Plan for KALGOV, iii) National Solid Waste Management Strategy (NSWMS) in line with 2025.
Output 2	Good practices of solid waste management /3R are promoted in the country and the region.
Output 3	CDL mechanisms suitable to RMI are explored by relevant authorities.

1.5 Inputs from JICA (Dispatch of Experts)

a. List of Experts

Expertise	First Term	Second Term	Third Term
Team Leader/ Solid Waste Management A1	Ichiro Kono	Ichiro Kono	Ichiro Kono
Sub-team Leader/ Solid Waste Management A2/ Capacity Development B1	Misa Oishi	Misa Oishi	Misa Oishi
Solid Waste Management C1/ Capacity Development B2	Koji Kusunoki	Koji Kusunoki	Koji Kusunoki
Solid Waste Management C2	Tomoe Kumagai	Tomoe Kumagai /Shinsuke Okamoto	Shinsuke Okamoto
Solid Waste Management C3/ Monitoring of Final Disposal Sites	Ai Akami	Ai Akami	Ai Akami
CDL		Richard Leney	Richard Leney
O&M of Collection Vehicles			Koji Uzawa

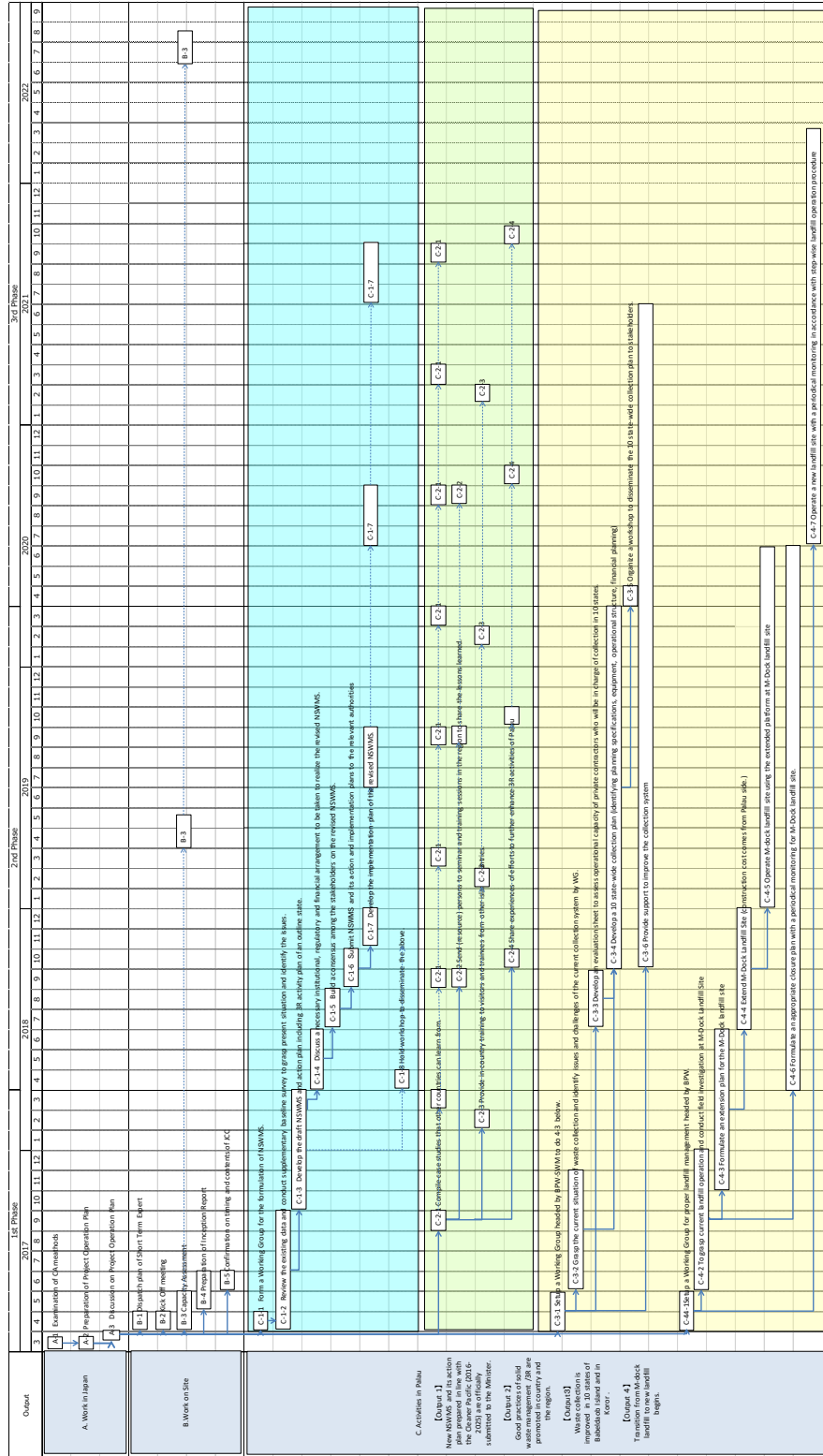
b. Inputs of Experts (As of August 2022)

Unit : MM

Place of Work	First Term	Second Term	Third Term
Home Country	2.62	7.19	27.13
Recipient Country	18.63	34.00	3.25
Total	21.25	41.19	30.38

2 Republic of Palau (Palau)

2.1 Project Flow Chart



2.2 Achievement of Outputs

Output 1. New NSWMS and its action plan prepared in line with the Cleaner Pacific (2016-2025) are officially submitted to the Minister.

The SWM baseline survey, which included incoming waste amount survey to the disposal site and the public opinion survey on waste discharge manner, was conducted from 8th to 18th Jun. 2017 to create a waste flow. Then the current SWM situation in Koror and 10 states in Babeldaob was analyzed technically and quantitatively based on the waste flow. The results were well shared among stakeholders through a series of meetings.

Palau Integrated Waste Strategy 2017 to 2026, which covers both solid and hazardous wastes, was drafted with support from SPREP by Jun. 2017. Based on this draft strategy, BPW-MPIIC in collaboration with J-PRISM II formulated National SWM Strategy 2017 to 2026 by updating the current SWM situation of Palau with the result of baseline survey. Contents of the National SWM Strategy (NSWMS) were discussed among counterpart officials such as BPW, EQPB and KSG and a consensus was reached among them through a series of discussions at the meetings. Finally, the NSWMS was submitted and approved by the Minister on 30th Jan. 2019 and the outline of the NSWMS was presented by the officer of BPW-MPIIC during the second JCC on 13th Feb. 2019. This was a great opportunity to disseminate the essence of the NSWMS.

Indicator for Output 1	Achievement level : 100%
1-1: Current SWM situation, issues and measures are elaborated in the NSWMS.	NSWMS with its action plan was formulated with assistance from SPREP and J-PRISM II in Nov. 2017.
1-2 : The NSWMS (final version) is submitted to the Minister	NSWMS with its action plan was submitted and approved by the Minister on 30 th Jan. 2019.

Output 2. Good practices of solid waste management /3R are promoted in country and the region.

Output 2 will be achieved through four activities which are “Activity 1: Compile case studies that other countries can learn from” “Activity 2: Send (resource) persons to seminar and training sessions in the region to share the lessons learned” “Activity 3: Provide in-country training to visitors and trainees from other island countries” “Activity 4: Share experiences of efforts to further enhance 3R activities of Palau”.

With regard to Activity 1, a good practice example, 'Initiatives for the introduction of a beverage container deposit system on Peleliu Island', was compiled and uploaded to the SPREP website¹. With regard to Activity 2, the following trainings were organized and the relevant C/Ps actively participated in the training.

- Training on Sanitary Landfill Design and Operation by Fukuoka Method (Feb. 2017/Palau)
13 government officers from BPW and KSG attended.
- Regional Disaster Waste Management Guideline development consultation workshop (Feb. 2019/Palau)
24 officers from BPW, KSG and other departments attended.
- On-Line Training for Proper Maintenance of Waste Collection Vehicles and Heavy Machineries (April 2021 - / On-line)

¹ <https://www.sprep.org/j-prism-2/lessons-learn>

Due to travel restrictions from COVID-19, the training which was originally planned as on-site training was modified into on-line training. The JICA project office informed the counterpart about the on-line training in April, and more detailed explanation and procedures, including how to shoot video clips during ordinary maintenance work which will become bases for training materials, were explained during regular web meeting in June. The video clip was shot and submitted by BPW to J-PRISM II trainer on July 20th. On 28 September, eight vehicle and heavy equipment operators and mechanics from BPW and six from KSG actively participated in an online training course on the main topic of preventive maintenance.

In addition, on 2 March 2022, to complement the above online training, a Regional Workshop was held for the three Micronesian countries, with approximately 100 participants. Ten vehicle and heavy equipment operators and mechanics from Palau participated in this workshop, which covered pre- and post-maintenance as well as regular maintenance and general vehicle management. In addition, the Palauan side contributed in terms of the provision of training materials, including the provision of videos during periodic inspections.

With regard to Activity 3, the following training was provided to trainees from outside the country.

- SWM training to Tuvalu Government Officers (Jan. 2018/Palau)
Ten government officers from the Ministry of Finance, the custom office and municipalities in Tuvalu were invited to the SWM workshop organized by the Palauan officials. The trainees learnt from experiences of Palau, such as CDL system in Palau, financial arrangement on SWM, recycling activities in Palau.

With regard to Activity 4, Palau's CDL experience was shared through the following opportunities.

- Third Steering Committee Meeting, Special Session “Designing CDL and the greater benefit for PIC” (Sep. 2019/Fiji)
- Third Clean Pacific Round Table 2021, Technical Session 1: “Government” (Nov. 2021/ On line)
- Third Clean Pacific Round Table 2021, Side event: “Session for Sustainable Financing” (Nov. 2021/On line)

Indicator for Output 2.	Achievement level : 100%
2-1: What is learned from the training organized by J-PRISM II Project Office (PO) is utilized.	As mentioned before, “the Follow-up Seminar and On-site Training on Sanitary Landfill Design and Operation by Fukuoka Method” was conducted in Palau and 13 personnel from Palau participated. Also, “Regional Disaster Waste Management Workshop” was conducted in Palau and 24 personnel from Palau participated. As for the Training on Sanitary Landfill, follow-up survey was conducted and the result was compiled in a report by the 3R/return expert of PO in Palau. As for the online training on waste collection vehicles and heavy machineries, the 1 st training will be held based on the video materials submitted by BPW, which is expected to contribute to proper management in the future.
2-2: Palau's experience is presented at regional level meetings.	Ten government officers from the Ministry of Finance, the custom office and municipalities in Tuvalu were invited to the SWM workshop organized by the Palauan officials. The trainees learnt from the following SWM experiences of Palau.

	<ul style="list-style-type: none"> • CDL system in Palau. • Financial arrangement on SWM • Recycling activities in Palau. <p>Furthermore, SWM and 3R activities in Palau were presented by officers of Palau during the second steering committee meeting of J-PRISM II in Fiji in Aug. 2018, the third steering committee meeting in Samoa in Sep 2019, the fourth steering committee meeting in Aug.2021, and the third CPRT held online in November 2021.</p>
--	---

Output 3. Waste collection is improved in 10 states of Babeldaob Island and in Koror

This output is closely linked with the construction of a new final disposal site in Aimeliik of Babeldaob Island (BBI). As the new landfill site was completed, all the state disposal sites in BBI will be closed in a stepwise manner. All the wastes generated in BBI have been collected and transported to the new landfill site from February 2021. A new waste collection plan for the entire BBI formulated based on the following conditions.

- All the state disposal sites in BBI shall be closed and all the wastes collected in BBI shall be transported to a new landfill site in Aimeliik.
- All the wastes discharged from households shall be collected and directly transported to the new landfill site without constructing transfer station.
- For all the states in Babeldaob Island, BPW shall provide waste collection services by itself or by contracting out to a private company.
- Short term experts' team shall assist to prepare specifications for waste collection services in BBI including collection route, collection point, collection schedule, collection frequency and so on.
- BPW and short term experts shall work together to formulate a waste collection plan in BBI and discuss with relevant state governments.

In Feb. 2019, GPS data loggers were installed in all the existing waste collection trucks in 10 states of BBI to record information such as waste collection route, points, schedule, and so on. The collected information revealed that all the households in BBI were provided with collection services. Therefore these service level should be maintained for future as well.

In Jan. 2020, waste collection route, collection points, collection time and collection distances are compiled and special specification for tender document to select collection companies were prepared. Tender for selecting waste collection companies was originally scheduled for April 2020, it was finally held in October 2020 due to delay in completion of the new landfill site caused by COVID-19. As a result of the tender, one company, Babeldaob Waste Collection Company, was selected. BPW had a meeting with the state governors of 10 states in Babeldaob and officials in charge to explain the planned inter-state collection system. After a trial collection in each state by the private contractor and other necessary preparations, inter-state collection services in Babeldaob started on 22nd of February 2021.

In June 2022, a team of short-term experts visited the site for the first time in two years and four months after the COVID 19 conflict, and confirmed that collection operations were continuing smoothly.

Indicator for Output 3	Achievement Level: 100%
[10 states in Babeldaob Island] 3-1: Critical issues of waste collection are identified by the counterpart officials.	The SWM baseline survey, which included incoming waste amount survey to the disposal site and the public opinion survey on waste discharge manner, was conducted from 8 th to 18 th Jun. 2017 to create a waste flow. Then the current SWM situation in Koror and 10 states in Babeldaob was analyzed technically and quantitatively based on the waste flow. The results were well shared among stakeholders through a series of meetings.
3-2: A 10 state-wide collection plan is formulated.	In Feb. 2019, GPS data loggers were installed in all the existing waste collection trucks in 10 states of BBI to record information such as waste collection route, points, schedule, and so on. Based on the analysis of the information, special specification for tender document to select collection companies were prepared in Jan. 2020.
3-3: Officials in charge of SWM in 10 states participate in a workshop to disseminate the 10 state-wide collection plan.	The workshop was implemented in Jan. 2021 due to the delay of the construction work of the new landfill site, though originally scheduled before Oct. 2020. BPW explained the planned inter-state collection system to the relevant officials and also organized a trial collection in each state with the private contractor.
3-4: Collection based on the 10 state-wide collection plan is initiated.	Tender for selecting waste collection companies was implemented in Oct. 2020 and a private contractor (Babeldaob Waste Collection Company) was selected as the result. The construction of a new final disposal site was completed in Nov. 2020. After a period of preparation, the inter-state collection service in 10 states of Babeldaob was commenced in Feb. 2021 with the opening of the new disposal site.
[Koror State] 3-5: Provided support/information is utilized by Koror State Government.	As SWM department of Koror State Government (KSG) is the important C/P of J-PRISM II, they are invited to all the seminars, workshops, and meetings organized by J-PRISM II to provide knowledge sharing opportunities as much as possible.

Output 4. Transition from M-dock landfill to a new landfill is appropriately carried out

For smooth transition from M-dock landfill to a new landfill, several activities were carried out as follows.

- Survey on incoming waste to the M-dock disposal site was conducted from 8th to 18th Jun. 2017. The amount of daily incoming wastes is observed as 27 tons/day.
- The remaining life period of the M-dock landfill site was estimated by J-PRISM II experts in Nov. 2017. It became known that another four to five years can be used as a landfill site by realignment of the access road.
- Aerial photos of the M-dock disposal site were taken by a drone in Feb. 2018 and three-dimensional model was developed. This model becomes a base map for future planning and operation of disposal site, along with continuous monitoring by the drone.
- CIP (Capital Investment Program) of BPW announced plans to make a contract for extension of the third berm at M-Dock landfill site with a private company in June, 2017. The contract is for the design and construction; however, there are no drawings available as of Feb. 2018.
- Private company, FIDC, was awarded for the above contract in Nov. 2017 with a contract

amount of 700,000US\$.

- In Feb. 2018, an approval to commence the work was announced by EQPB and actually construction work has started. After commencement of the work, it was advised by the J-PRISM II expert team that the realignment of access road would increase landfill capacity and prevent scattering of wastes in front of the entrance. BPW has ordered these changes to the contractor accordingly.
- In Oct. 2018, it was informed that the work has completed. J-PRISM II expert team assisted to investigate whether third berm was constructed in accordance with the specification written in the contract and also whether alignment of the access road was in accordance with the revised instructions by BPW. As the three-dimensional drawing developed by aerial photos revealed that the height of third berm was lower than it should have been, BPW instructed the contractor to rectify that.
- Upon the completion of M-Dock extension work, aerial photos were taken by the drone and three-dimensional drawing with contour line was developed in order to calculate capacity of the landfill within the third berm. It was estimated quantitatively and technically that the M-dock landfill site will be utilized for another three years.
- In Oct. 2020, since one year has passed after extension work of 3rd embankment berm was completed, aerial photos were taken by the drone and three-dimensional drawing was developed again in order to analyze increased landfill volume and calculate remaining landfill period for current disposal site. As a result, it was revealed that two years more will be utilized under certain conditions².
- As the travel restriction due to COVID-19, the possibility of monitoring the M-Dock landfill site is exploring remotely using drones in consultation with a GIS expert in PALARIS (Palau Automated Land and Resource Information System). Verifying accuracy and developing 3D models are underway using aerial images acquired by an operator in Palau. To establish remote monitoring system, further cooperation and discussion will be continued with relevant authorities.
- Construction of the new disposal site continued during the COVID-19 conflict and, despite some delays, was completed in November 2020 and a completion ceremony was held. The transition from the old M-Dock disposal site to the new disposal site (National Landfill Site in Aimeliik) was extremely smooth, with no illegal dumping or other problems, and all waste from Koror and the 10 states of Babeldaob was transported to the new National Landfill Site(NLS).
- The NLS is equipped with truck weighing equipment and weighs all the waste collection trucks. The results of the weigh bridge record from February 2021 to April 2022 were obtained, compiled and analyzed, and confirmed that all the wastes from Koror and 10 states in Babeldaob Island were transported and disposed.
- BPW is currently considering charging for commercial and business waste other than household waste at the NLS, and the short-term expert team has estimated and presented how much revenue would be generated by charging per ton.

² Third berm need to be extended for the height of five meters according to the design and access road needs to be extended up to top of third berm and full volume within third berm can be utilized for landfilling.

Indicators for Output 4	Achievement Level : 100 %
4-1: M-dock is in the process of landfilling in line with a closure plan.	Final shape of M-dock landfill site was presented based on the three-dimensional model developed from aerial photos taken by a drone. Landfill operation in the site was conducted and periodical monitoring by the drone was carried out until operation of the new landfill site was commenced. After commencement of landfill operation at the new disposal site, M-Dock landfill site was returned to Koror State Government to utilize for the landfill site for disposing residue from recycling operation by KSG.
4-2 : A new landfill site is operated in accordance with step-wise landfill operation procedure	Earth breaking ceremony for a new landfill site in Aimeliik was held in Mar. 2019 and the construction work was completed in Nov. 2020. After a period of preparation including a trial collection with the contractor, landfill operation at new disposal site was commenced in Feb. 2021.

Others: Transportation Station Project by Koror State Government (KSG)

Current M-Dock landfill site is transferred to KSG as per schedule after new landfill site operation was commenced. KSG has prepared a concept paper³ for developing 'Transportation Station' with waste segregation function in the site.

According to the concept paper, the current area to dismantle end-of-life vehicles will be converted as a place to construct a segregation station with belt conveyor system. Household waste will be coming to and segregated at the station. Target wastes to be segregated are (1) kitchen wastes, (2) green wastes, (3) papers, (4) can, grass bottles, PET, (5) plastics (PP, PE), (6) others. (1), (2) and (3) will be used for composting, (4) will be used for CDL materials and (5) will be used for waste plastic pyrolysis system which is under renovation.

Furthermore, there is another plan for biogas generation plant which uses sludge from wastewater plant and kitchen wastes from hotels and restaurants as well as RPF plant which uses waste plastics. However, for these plans, careful investigation on availability of input materials, marketability of output products and financial feasibility will be required.

2.3 Achievement of Project Purpose

The project has the following common regional and country-specific project purposes.

- **(Region-wise)** Human and institutional capacity base for sustainable Solid Waste Management in the Pacific region is strengthened through implementation of Cleaner Pacific 2025.
- **(Palau)** With a view to commencement of a new landfill site, a solid waste management system is improved.

The indicators to measure the achievement of Palau's project purpose are "1. Inter-state collection in Babeldaob is carried out." and "2. A new landfill site is sustainably operated." The achievement level was considered as 100% as follows.

³ The concept paper for the Koror State government "Transportation Station Project" received in Mar. 2019.

Indicators	Achievement level : 100%
1. Inter-state collection in Babeldaob is carried out.	The private contractor for inter-state collection in the 10 states of Babeldaob was selected in October 2020 and inter-state collection was started in January 2021; the contract was renewed in January 2022 and stable collection operations are still ongoing.
2. A new landfill site is sustainably operated.	The new landfill site, which was completed its construction in November 2020, began operation in February 2021 after preparatory work to receive the waste. Weighbridge data confirms that the facility is in continuous use for more than a year since its inauguration. In order to ensure a financially sustainable structure, BPW is currently considering the introduction of tipping fees for commercial waste.

2.4 Recommendations to Achieve Overall Goal

The project has the same overall goal listed below for all J-PRISM II countries.

- **(Region-wise)** Sustainable management of solid waste in the Pacific region is enhanced based on Pacific Regional Waste and Pollution Management Strategy 2016-2025 (Cleaner Pacific 2025)

Although no indicators have been established to measure the achievement of the overall goal, in Palau, the project purpose has been achieved, which is a significant contribution to the strengthening of self-sustaining waste management in the Oceania region.

2.5 Means and Lesson Learnt from the Project

- NSWMS and its action plan was approved by the Minister on 30th Jan. 2019. This action plan will be implemented with periodical monitoring by the Palau's Government.
- Output 3: formulation of collection plan and output 4: transition of M-dock landfill to a new landfill site, are closely linked with the progress of grant aid project for construction of a new landfill site in Aimeliik. The work for the new landfill site was commenced in Mar. 2019 and completed in November 2020. Activities for these outputs was carried out in accordance with the progress of the construction work of the new landfill site. The new site has been smoothly operated since February 2021. Necessary support was provided including monitoring of the operation and management.
- A method to monitor landfill operation by utilizing a drone was developed. It makes monitoring operation as well as estimation of lifetime easy and cost efficient for any counterpart officials. At the same time, the monitoring data can be utilized as a tool to convince decision makers to invest for a new landfill site in a timely manner.
- In Koror, recycling activities are active, including the collection of aluminum, PET and glass bottles through the CDL system and their export to Taiwan (aluminum and PET only), compost production using green waste and cardboard as the main raw material, the conversion of waste plastic into oil and the refining of waste oil. There are also many good practices that other countries can learn from, such as the volume reduction of waste tires and the securing of waste management funds through the CDL system.
- In recent years, a glassworks factory has been built using waste glass, and glasswork experts have been invited from Japan to provide education for Palauan and hands-on training

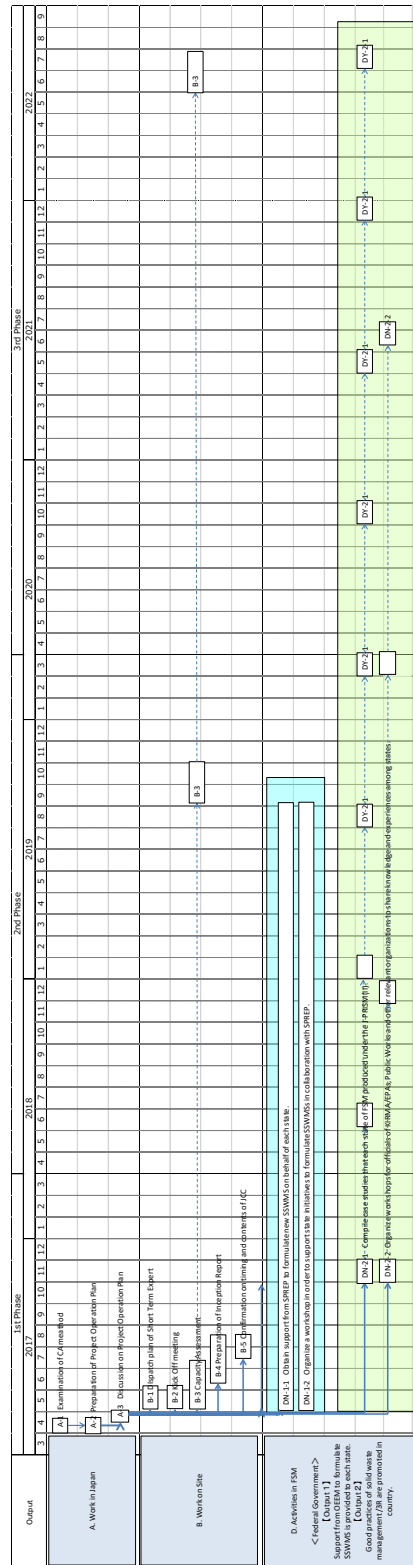
opportunities for tourists, contributing to the creation of an attractive tourist destination.

- It is expected to continue to serve as a base for recycling-related activities in the Micronesian region, and is also expected to cooperate with other countries in the region by accepting PET that is no longer destined for collection by the CDL and exporting it to other countries through intermediate treatment.
- Although short-term experts have not been able to travel to Palau due to the pandemic of COVID-19 since the commencement of the third period of the project, necessary technical supports have been provided while keeping in touch with the C/P through regular web-based meetings. In addition to activities based on the PDM, flexible support was provided in response to requests from the C/Ps, such as Support for proper closure planning of existing disposal site in Airai state of Babeldaob, and support for T-dock reclamation project utilizing waste tires as backfill materials

3 The Federated States of Micronesia (FSM)

3.1 Federal State

3.1.1 Project Flow Chart



3.1.2 Achievement of Outputs

Output 1: Support from DECEM (former OEEM) to formulate SSWMS is provided to each state.

First SWM workshop was held on 27th Sep 2017 in Pohnpei and Ms. Ma Bella, an SWM expert from SPREP was invited. DECEM has taken responsibilities for inviting the expert from SPREP, providing logistic support for all the CP from four states of FSM as well as chairing the workshop. DECEM has provided a valuable opportunity for officials of four states to share the information on the current SWM practices in each state and exchange their knowledge and experiences. Thanks to the presentation by Ms. Ma Bella, the participants could understand the essence of CP2025 well at this occasion.

From the end of the first SWM workshop to the present, SSWMSs of all four states have been formulated and endorsed by the governors.

Indicator of Output 1	Achievement level : 100%
1-1: Core concept of CP2025 are incorporated into SSWMSs.	State representatives who participated in the first SWM workshop gained a great opportunity to understand the core concept of CP2025 as well as its aim, i.e. achievement of practical and sustainable SWM among PICs. Guiding Principles of SSWMSs of all four states were set according to the concept of CP 2025. Thus, it can be concluded that core concepts of CP2025 are now incorporated into SSWMSs.

As just mentioned, Output 1 has already been achieved, but in relation to this, DECEM has requested J-PRISM to support for the development of a National Waste Management Strategy. DECEM has expressed a determined intention to address not only solid wastes but also hazardous wastes in this strategy. Thus, J-PRISM decided to support DECEM in cooperation with SPREP. To date, several web conferences have been held between DECEM, SPREP and J-PRISM, and DECEM formulated a final draft of the National Waste Management Strategy based on the advice of SPREP and J-PRISM.

Output 2: Good practices of solid waste management /3R are promoted in country.

This output consists of two activities, namely (i) Compile case studies that each state of FSM produced under the J-PRISM II and (ii) Organize workshops for officials of KIRMA/EPAs, Public Works and other relevant organizations to share knowledge and experiences among states.

As for the first activity, notable achievements to date, i.e. the development of State Solid Waste Management Strategies in each state, and the introduction of Inter-Municipal Collection Service (IMCS) in Kosrae, have been compiled as case studies. In addition, a booklet of cases and findings was prepared by the C/P of DECEM.

As for the second activity, first SWM workshop was organized on Sep. 27th, 2017 and State Project Directors, State Project Managers and SWM technical officers from each state of FSM attended the workshop and results of the SWM baseline survey was shared among them. Then, the second SWM workshop was held on Sep. 26th, 2019 and representatives from each state presented their status of waste collection as well as their efforts to improve it. A similar joint SWM workshop was planned for the final year of the project to promote knowledge sharing among the states, but due to the travel restrictions imposed by the Covid-19, this could not be materialized. Instead, the 5th JCC was conducted online and jointly by the three Micronesian countries, providing an opportunity not only for knowledge sharing

among states, but also among countries and states.

Indicator of Output 2	Achievement level : 95%
2-1 Compiled case studies are shared with other countries through DECEM	The cases and findings accumulated throughout the project period have been shared at the SWM workshops and JCCs. In addition, the C/P of DECEM has taken an initiative in compiling such cases and findings in the form of a booklet.
2-2 Three times of workshops are provided to share knowledge and experiences among four states.	<p>At the occasion of the first SWM workshop held on Sep 27th, 2017, state representatives made presentations on the results of SWM baseline survey. The counterparts themselves understood the results sufficiently and made presentations, which deepened their understanding of the current situation and the problems, and were beneficial for the subsequent SSWMS formulation.</p> <p>At the second SWM workshop held on Sep. 26th, 2019, representatives from each state presented their status of waste collection as well as their efforts to improve it. Since waste collection is a critical issue in every state, the thematic discussion at this second workshop provided a great opportunity to share their concerns through active discussion.</p> <p>Although the third SWM workshop could not be held due to the Covid-19, it can be said that sharing of knowledge among countries and states took place on occasions such as the 5th JCC and training sessions.</p>

3.1.3 Achievement of Project Purpose

The project has the following common regional and country-specific project purposes.

- **(Region-wise)** Human and institutional capacity base for sustainable Solid Waste Management in the Pacific region is strengthened through implementation of Cleaner Pacific 2025.
- **(FSM-National)** Support to creation of solid waste management system in each four state is provided.

The indicator to measure the achievement of project purpose of FSM-National is "1. Supports provided to each states (i.e. workshops and trainings, etc.)." The achievement level was considered as 100% as follows.

Indicators	Achievement level : 100%
1. Supports provided to each states (i.e. workshops and trainings, etc.).	As explained in the section of "Achievement of Outputs", DECEM took the initiative in compiling the case studies. In addition, DECEM organized SWM workshops to enhance knowledge sharing among four states in collaboration with J-PRISM, and it can be said that support was provided to each state.

3.1.4 Recommendations to Achieve Overall Goal

The project has the same overall goal listed below for all J-PRISM II countries.

- **(Region-wise)** Sustainable management of solid waste in the Pacific region is enhanced

based on Pacific Regional Waste and Pollution Management Strategy 2016-2025 (Cleaner Pacific 2025)

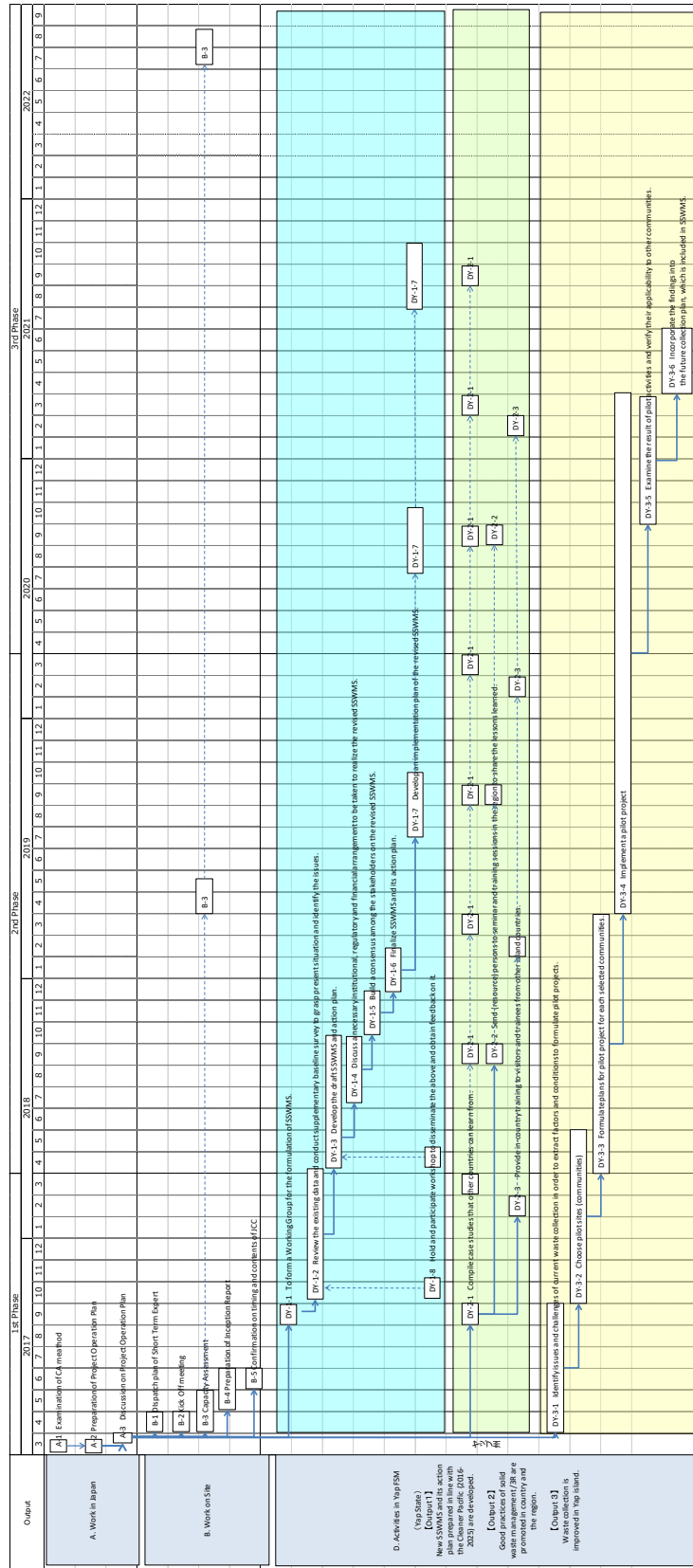
Although no indicators have been established to measure the achievement of the overall goal, In FSM as a country, the achievement level of project purpose is satisfactory, which is a significant contribution to the strengthening of self-sustaining waste management in the Oceania region.

3.1.5 Means and Lesson Learnt from the Project

- In the first SWM Workshop held on 27th September 2017 and the second SWM workshop held on 26th September 2019, three counterparts from each state were invited to Pohnpei. In doing so, the airfare was borne by J-PRISM II while the accommodation and daily allowance were borne by DECCEM. In such a way, both the first SWM workshop and the second SWM workshop were successfully co-organized by DECCEM and J-PRISM II. Also at the workshops, the DECCEM Director and the Assistant Director served as chairman, leading to active discussion and promoting sharing of knowledge among the states. Of course, knowledge sharing with other island countries is indeed important, but in case of FSM, it was reiterated that such knowledge and experience sharing among four states shall be promoted first.
- J-PRISM will actively respond to the needs of C/P organizations that arise in the course of project implementation (in this case, the development of a National Waste Management Strategy, as requested by DECCEM). Currently, DECCEM is taking an initiative to develop the strategy in collaboration with the relevant parties in each state. The responsiveness to the needs of C/P organizations will enhance and in fact enhanced their ownership.

3.2 Yap State (Yap)

3.2.1 Project Flow Chart



3.2.2 Achievement of Outputs

Output 1: New SSWMS and its action plan prepared in line with the Cleaner Pacific (2016-2025) are developed.

Firstly, the waste flow of Yap, the foundational tool for formulating the SSWMS, was drawn based on SWM baseline surveys (public opinion survey on waste discharge manner, incoming waste survey to the disposal site, and survey on community dump site, etc.) conducted in June 2017. Through the waste flow analysis, key stakeholders understood and shared the current technical conditions and quantitative situations of SWM in Yap. From October to November 2017, various SWM related issues that should be taken as the strategic activities were identified in weekly stakeholder meetings, which are then compiled as SSWMS and the attached Action Plan. On 27 November 2017, a workshop was held to provide the detailed information on the SSWMS in which the stakeholders were participated in thorough questions-and-answers session which helped to share the common understanding of SSWMS among the participants and eventually reached to finalize the SSWMS (draft).

Consequently, Yap SSWMS, the first SSWMS officially endorsed, was approved on 14 September 2018 by the Governor. It is worth noting that the OPW&T successfully negotiated with Federal Government based on the approved SSWMS and secured budgets⁴ for improvement of waste collection services.

Indicator of Output 1	Achievement level : 100%
1-1 The SSWMS (final version) is submitted to the relevant authority	SSWMS and its Action Plan were explained to the stakeholders at a workshop held on 27 November 2017, and SSWMS (draft) was agreed after thorough questions-and-answers session. It was then approved by the Governor on 14 September 2018. Furthermore, SSWMS was used as a base for budgetary request by the OPW&T.

Output 2: Good practices of solid waste management / 3R are promoted in the country and the region.

This output consists of three activities, namely (i) compiling case studies that FSM states and other PICs can learn from, (ii) sending (resource) persons to seminar and training sessions in other FSM states and PICs to share the lessons learned, and (iii) providing in-country training to visitors and trainees from other FSM states and PICs.

As for Activity 1, formulation of state waste management strategies based on waste flow analysis has been compiled as a good practice and uploaded to the SPREP website⁵. Unlike previous assistances provided by the J-PRISM or other donors, the waste management strategy was formulated with emphasizes on the importance of understanding the current conditions of SWM technically and quantitatively in order to set the strategic goals and activities.

As for Activity 2, the following opportunities were provided

- The first SWM workshop in Pohnpei (September 27, 2017)
Mr. Manuel Maleichog, Mr. Jesse Sigeyog of DPW&T, and Ms. Christina Fillmed of EPA participated in and presented the result of SWM baseline survey of Yap in the workshop.

⁴ Contractual budget for improvement of collection and installation of three collection stations.

⁵ <https://www.sprep.org/j-prism-2/lessons-learn>

- The Follow-up Seminar and On-site Training on Sanitary Landfill Design and Operation by Fukuoka Method in Palau (From February 2 – 5, 2018)
Mr. Jesse Sigeyog of DPW&T participated in the seminar.
- Regional Disaster Waste Management Guideline Development Consultation Workshop in Palau (From February 18 – 20, 2019)
Mr. Jesse Sigeyog of DPW&T participated in the workshop.
- The second SWM workshop in Pohnpei (September 26, 2019)
Mr. Jesse Sigeyog of DPW&T, Ms. Christina Fillmed of EPA, and Mr. Jesse Faimaw of Island Paradise -- the recycling company, participated in and presented the waste collection expansion PP.
- The On-Line Training for Proper Maintenance of Waste Collection Vehicles and Heavy Machineries (February 3, 2022/ On-line)
Due to travel restrictions from COVID-19, the training which was originally planned as on-site training was modified into on-line training. The JICA project office informed the counterpart about the on-line training in April, and more detailed explanation and procedures, including how to shoot video clips, which serve as training materials, during ordinary maintenance work, were explained during a regular web meeting in June. After the video clips were shot and submitted to the J-PRISM II trainer, the on-line training was carried out on February 3, 2022 with 5 participants, including engineers and operators, from the Department of Public Works & Transportation (DPW&T).

Indicator of Output 2	Achievement level : 100%
2-1 What is learned from the training organized by J-PRISM II Project Office is utilized.	<p>In the 4 states of FSM, the current condition of the waste management was studied technically and quantitatively through a baseline survey. The waste management strategy and its subsequent priority activities were developed based on the result of this actual baseline survey. By summarizing this experience as a good practice, it is expected to help if the waste management strategy needs to be reviewed in the future.</p> <p>Mr. Jesse Sigeyog of DPW&T participated in the Follow-up Seminar and On-site Training on Sanitary Landfill Design and Operation by Fukuoka Method in Palau, as well as Mr. Jesse Sigeyog of DPW&T participated in Regional Disaster Waste Management Guideline Development Consultation Workshop in Palau. Although Mr. Jesse Sigayog has resigned DPW&T, a private company performing the operation and management of the public disposal site inherited the lessons and executing the proper management of the landfill site. The practices include a raising an access road of the site and vertically extending the ventilation pipes and extending the landfill capacity.</p> <p>Furthermore, the state of YAP received a 4-ton compactor truck from the Embassy of Japan in its Grass Root Grant Aid in August 2020. Though the preparation for expansion of waste collection service has been halted, the on-line training for vehicle / heavy machinery maintenance contributed the proper management of the equipment in the future</p>

Output 3: Waste collection is improved in Yap Island

a. Issues and Problems in Waste Collection

From the result of the baseline survey, including waste flow chart, conducted in 2017, following issues and problems became evident on waste collection in the state of Yap.

- In the state of Yap, waste is collected by private companies contracted with DPW&T. Nonetheless, the waste collection by the contractor is limited to public waste from schools and public offices in Colonia.
- Average incoming waste to public disposal site is 5.63 ton per day of which waste collected by regular service account for only 23% or 1.29 ton/day. Remaining 77% or 4.36 ton/day is brought directly by residents, indicating that the waste collection service has not been provided sufficiently.
- However, in areas far away from the public disposal site, there are some community dump (CD) sites managed by communities, and proper management is difficult in those community run dump sites as bulky wastes, scraps, and indecomposable plastic wastes, etc. are continued to be disposed improperly. EPA, therefore, has been closing the community dump sites.

At first, in order to improve those situation, relevant bodies discussed and agreed to formulate and implement the waste collection expansion Pilot Project (PP) to verify the reliability and sustainability of expansion of the waste collection services outside of Colonia.

b. Selection of Target villages for PP

b.1 Survey on Current Situation

In order to select the target villages, a survey was conducted in 39 villages with more than 15 households out of 98 villages in the state of Yap. Among them, 9 villages in Tamil have already received the waste collection services; therefore, similar survey was carried out for those 9 villages to identify not only the existing situation but problems in existing collections so that those problems will be addressed in the PP. The content of the survey include whether there is a) a community dumpsite, b) existing collection services, c) a request for the collection services by the residents, d) willing to pay the collection fees, as well as e) distance to the disposal site and f) road condition in the area.

b.2 Selection Criteria and the Result of the Selection

Based upon the following selection criteria, 6 villages showing in the table below were selected as PP target villages.

1. A village is located more than 15 km away from the public disposal site in Colonia and has a problem with waste disposal.
2. Access road to the village is unpaved for more than 3km and difficult to transport waste.
3. A village has existing community dump site.
4. A village has no waste collection services.
5. A village has waste collection station built by DPW&T to expand the waste collection services in Tomil.
6. A village strongly request waste collection services to be provided.

No	Municipality	Name of village
1	Gagil	Gachpar
2	Gagil	Wanyan
3	Gagil	Ruu
4	Gagil	Amun
5	Fanif	Gilfith
6	Fanif	Rumuu

c. Expansion Plan for the Collection Service

Initially the content of the PP was as follows.

Collection method	Station collection system (Collection stations are installed in each PP village.)
Collection frequency	Four times a month (Every week)
Collection company	One collection company selected by DPW&T through appropriate selection procedure
Collection cost	US\$4,500-/year
Collection fee	3US\$ /month/ family

d. Progress by now

PP for expansion of waste collection was formulated; nonetheless, little fire ants (LFA) founds in some of the PP target communities caused the waste collection in the area to be banned. In addition, a lack of financial resources for a plan to expand the waste collection to island-wise using the 4-ton compactor truck acquired through the Grass Root Grant Aid has been frozen. At the current budget level, unfortunately, it is barely possible to maintain the waste collection in Colonia area and management of the landfill site.

Since the understanding and commitment of C/P organizations is vital when conducting a pilot activity/assistance work, the waste collection improvement/expansion were repeatedly and carefully explained in the meetings including web-meetings, but it was not realized by now, unfortunately.

As for the achievement level of the output 3, it can be summarized as follows.

Indicator of Output 3	Achievement level : 50%
3-1 Collection rate is improved in the pilot project area. 3-2 A waste collection improvement plan is formulated.	Even though the PP for expansion of collection was formulated, the target was not achieved in the phase 2 due to LFA issues and lack of budget. Various preparatory works have been carried out, including site surveys with relevant bodies, numerous consultation meetings, development of a leaflet on waste discharge manners, and holding community meetings. The C/P personnel who performed these tasks has resigned and the lessons are now inherited to a deputy director of the department.

Other important activities

a. Improvement of the landfill site

In order to increase the capacity of the final disposal site, following improvements were made:

- As the waste accumulation reached to the top of the ventilation pipes (20 feet height), DPW&T prepared the necessary pipes, and the subcontractor (the Island Paradise) performed the actual construction work.
- By raising the access road height, which works as an embankment, the capacity of the landfill was increased.

b. Managing the final disposal site based on entrance monitoring sheet

In phase 2, managing the final disposal site using the entrance monitoring sheet was introduced; unfortunately, however, the sheet was not fully utilized since the sheet recorded numerous errors. In response, J-PRISM2 carried out an on-line training on how to properly use the monitoring sheet to avoid the occurrence of errors.

The monitoring sheet is composed of 3 types of sheets:

- Monthly sheet (colored pink): Summary of each day of a particular month is automatically reflected from daily sheet. It also generates 3 graphs automatically, namely, number of incoming vehicles, type of incoming waste, and collection waste and individual transported waste.
- Daily sheet (colored light green): Daily record of waste data based on submitted record from the landfill. Key sheet of the monitoring sheet.
- Recording sheet (colored yellow): Bases of the record. Should be printed out and given to the landfill gatekeeper.

Causes of the errors and how to deal when the error:

It was found that the monitoring sheet submitted by the gatekeeper of the landfill site sometimes did not contain necessary information. When the data is transferred to the daily sheet at the DPW&T office, the blank data gave error codes, such as #VALUE! or #N/A. J-PRISM2, therefore, stressed the importance of the daily sheet and recommended the followings:

- a. Instruct the landfill staff to fill out the recording sheet completely, and
- b. Inquire the landfill staff about the missing / wrong information, or
- c. Make educated guess by, for example, conjecture from available information like type of vehicle, source of the waste, similar data from different date, or such information.

c. Continued operation of the Container Deposit System

Since it started in 2009, the container deposit recycling system has been operated by a private entity and constantly monitored by EPA. The system in Yap is well institutionalized and operated stably and continuously.

3.2.3 Achievement of Project Purpose

The project has the following common regional and country-specific project purposes.

- **(Region-wise)** Human and institutional capacity base for sustainable Solid Waste Management in the Pacific region is strengthened through implementation of Cleaner Pacific 2025.
- **(FSM-Yap)** Creation of solid waste management system is promoted.

The indicators to measure the achievement of project purpose of FSM-Yap are "1. Current SWM situation is technically as well as quantitatively analyzed and understood.", "2. SWM challenges are identified." and "3. Measures to tackle identified SWM challenges are proposed." The achievement level was considered as 80% due to the following reasons.

Indicators	Achievement level : 80%
1. Current SWM situation is technically as well as quantitatively analyzed and understood.	In 2017, the first year of the project, a series of SWM baseline surveys were conducted in each state with government officials in charge of waste management, such as waste amount and composition survey, incoming waste amount survey, and public opinion survey to residents. The results were compiled as waste flows and shared among all key officials involved.
2. SWM challenges are identified.	Based on the waste flow analysis, waste management issues that need to be urgently addressed in each state were identified quantitatively and technically, and such priority issues were widely shared among stakeholders.
3. Measures to tackle identified SWM challenges are proposed.	Along with the priority issues identified above, the strategy also includes an action plan (for each priority issue, with detailed activities and budgets), the contents of which were also shared with all concerned. From this series of activities, it can be said that the achievement of the project purpose in terms of indicators is good, however the achievement level is set at 80% because the achievement of Output 3 was less than expected.

3.2.4 Recommendations to Achieve Overall Goal

The project has the same overall goal listed below for all J-PRISM II countries.

- **(Region-wise)** Sustainable management of solid waste in the Pacific region is enhanced based on Pacific Regional Waste and Pollution Management Strategy 2016-2025 (Cleaner Pacific 2025)

Although no indicators have been established to measure the achievement of the overall goal, In FSM as a country, the achievement level of project purpose is satisfactory, which is a significant contribution to the strengthening of self-sustaining waste management in the Oceania region.

3.2.5 Means and Lessons Learnt from the Project

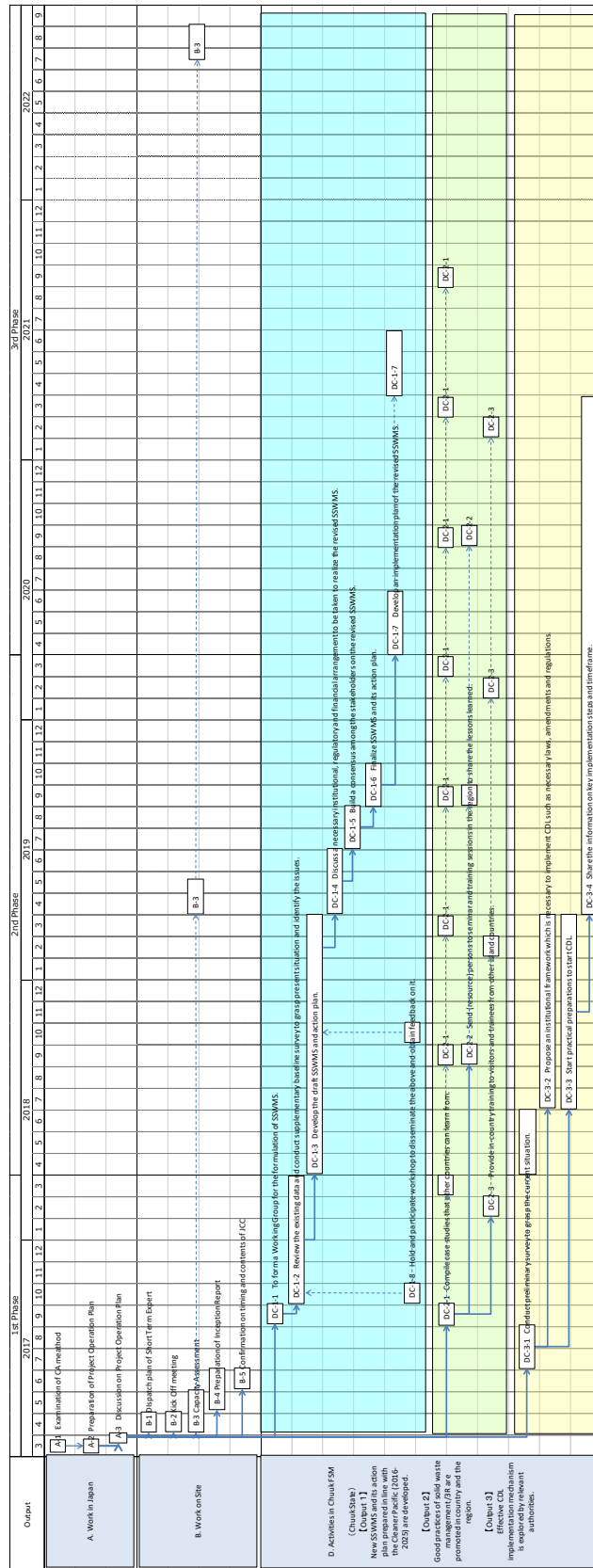
- Yap SSWMS, the first SSWMS officially endorsed in FSM, was approved on 28 May 2018 by the Governor. It is worth noting that the DPW&T successfully negotiated with Federal Government based on the approved SSWMS, but the budget was not allocated due to deterioration of financial situation during the phase 2.
- It is necessary to review and revise the waste collection improvement plan developed with

relevant bodies to match the financial situation of the state as well as to utilize the compactor truck acquired through Japanese Grass Root Grant Aid.

- It is not possible to ignore the financial issues in providing assistance when necessary budget cannot be secured to improve the waste collections. State of Yap is chronically lacking the financial resources needed for waste management, it is important to discuss with relevant bodies on how to secure financial resources in the future.
- The final disposal site has been properly managed by a private company that the DPW&T has a contract with and that inherited knowledge learned in the JICA training. The proper management include, extending the ventilation pipes and increasing landfilling capacity by raising an access road.

3.3 Chuuk State (Chuuk)

3.3.1 Project Flow Chart



3.3.2 Achievement of Outputs

Output 1: New SSWMS and its action plan prepared in line with the Cleaner Pacific (2016-2025) are developed.

Firstly, the waste flow of Chuuk, the foundational tool to formulate the SSWMS, was drawn based on the SWM baseline survey (public opinion survey on waste discharge manner, incoming waste survey to the disposal site, etc.) conducted in June and July 2017. Through the waste flow analysis, key stakeholders understood the current SWM situations in Chuuk technically as well as quantitatively. Then, in June 2018, SWM challenges that should be taken as the strategic activities were identified at weekly stakeholder meetings, and are compiled as SSWMS and the attached Action Plan. On June 25, 2018, a workshop was held to provide the participants with the information on the essence of the SSWMS. After active questions and answers on the contents of SSWMS at the workshop, SSWMS (draft) was finalized. Subsequently, the governor of Chuuk approved SSWMS on June 29, 2018.

Indicator of Output 1	Achievement level : 100%
1-1 The SSWMS (final version) is submitted to the relevant authority	Stakeholders were gathered, SSWMS and its Action Plan were explained to the stakeholders at a workshop held on June 25 th 2018, and SSWMS (draft) was agreed after questions and answers. Then it was approved by the governor on June 29, 2018.

Output 2: Good practices of solid waste management /3R are promoted in the country and the region.

This output consists of three activities, namely (i) Compile case studies that other states of FSM as well as other PICs can learn from, (ii) Send (resource) persons to seminar and training sessions in other states of FSM as well as in PICs to share the lessons learned, and (iii) Provide in-country training to visitors and trainees from other states of FSM as well as other PICs.

As for Activity 1, formulation of state waste management strategies based on waste flow analysis has been compiled as a good practice and uploaded to the SPREP website⁶. Unlike previous assistances provided by the J-PRISM or other donors, the waste management strategy was formulated with emphasizes on the importance of understanding the current conditions of SWM technically and quantitatively in order to set the strategic goals and activities.

As for Activity 2, the following opportunities were provided

- The first SWM workshop in Pohnpei (September 27, 2017)
Mr. Ismael H. Mikel and Ms. Joyce Sewell of EPA as well as Mr. Tos Nakayama of DT&PW participated in and presented the result of SWM baseline survey of Chuuk.
- The Follow-up Seminar and On-site Training on Sanitary Landfill Design and Operation by Fukuoka Method in Palau (From February 2 – 5, 2018)
Mr. Tos Nakayama of DT&PW participated in the above seminar.
- Regional Disaster Waste Management Guideline Development Consultation Workshop in Palau (From February 18 – 20, 2019)
Mr. Tos Nakayama of DT&PW participated in the above workshop.
- The second SWM workshop in Pohnpei (September 26, 2019)

⁶ <https://www.sprep.org/j-prism-2/lessons-learnit>

Ms. Joyce Sewell of EPA and Mr. Tos Nakayama of DT&PW participated in this workshop and Mr. Tos Nakayama presented the waste collection system in Chuuk.

- The On-Line Training for Proper Maintenance of Waste Collection Vehicles and Heavy Machineries (September 13, 2021)

Due to travel restrictions from COVID-19, the training which was originally planned as on-site training was modified into on-line training. The JICA project office informed the counterpart about the on-line training in April, and more detailed explanation and procedures, including how to shoot video clips, which serve as training materials, during ordinary maintenance work, were explained during a regular web meeting in June. Based upon the video clips submitted from Chuuk side, a pre-consultation meeting with mechanics was held on September 13, followed by the on-line training on October 20 with 12 participants including some participants from service department of the airport.

Indicator of Output 2	Achievement level : 100%
2-1 What is learned from the training organized by J-PRISM II Project Office is utilized.	<p>In the 4 states of FSM, the current condition of the waste management was studied technically and quantitatively through a baseline survey. The waste management strategy and its subsequent priority activities were developed based on the result of actual baseline survey. By summarizing this experience as a good practice, it is expected to help if the waste management strategy needs to be reviewed in the future.</p> <p>As mentioned above, Mr. Tos Nakayama of DT&PW participated in both the Follow-up Seminar and On-site Training on Sanitary Landfill Design and Operation by Fukuoka Method in Palau and Regional Disaster Waste Management Guideline Development Consultation Workshop in Palau.</p> <p>In addition, two 4-ton compactor vehicles were provided to Chuuk through a non-project type grant aid of Japan. Also, online Training for Proper Maintenance of Waste Collection Vehicles and Heavy Machineries, which was conducted during the second half of the project period, contributed significantly to the future maintenance of collection vehicles.</p>

Output 3: Effective CDL implementation mechanism is explored by relevant authorities.

Although Chuuk has a history of being the first state to adopt the recycling law among the four states of FSM, currently it is the only state that has not practiced recycling activities at all in FSM. Since the introduction of beverage container recycling (hereinafter referred to as CDL) is strongly desired, J-PRISM II started discussion on an effective CDL implementation mechanism with related organizations and started supporting key stakeholders to inaugurate CDL. The related activities implemented to date are as follows.

- A Preliminary Survey on Container Deposit Legislation for Pohnpei and Chuuk States of the FSM (Survey period: July 8 – 13, 2017)

Reviewed the CDL mechanisms described in the old law, estimated the beverage containers imported and consumed in Chuuk, and recommended the new effective CDL mechanisms, i.e. legal framework, target items, preparation of seed money, etc.

- Support to amend the CDL law

Supported EPA to amend the CDL law. The amendment was reviewed by the Attorney General, and soon will be submitted to the State Legislative Assembly for approval.

- **Procurement of recycling equipment and facility**
It is necessary to procure recycling equipment and facilities in order to inaugurate CDL. EPA procured the press machines with support of the Grass Root Grant Aid.

Indicator of Output 3	Achievement level : 60%
3-1 Guideline on implementation procedure such as measurement, accounting and data collection is prepared.	Equipment necessary for CDL, namely press machines, has been procured and now the CDL laws should be amended. Once amended, Chuuk EPA needs to develop a regulation that defines procedure for CDL implementation, and J-PRISM II has informed Chuuk EPA what kind of procedure will be required.

3.3.3 Achievement of Project Purpose

The project has the following common regional and country-specific project purposes.

- **(Region-wise)** Human and institutional capacity base for sustainable Solid Waste Management in the Pacific region is strengthened through implementation of Cleaner Pacific 2025.
- **(FSM-Chuuk)** Creation of solid waste management system is promoted.

The indicators to measure the achievement of project purpose of FSM-Chuuk are "1. Current SWM situation is technically as well as quantitatively analyzed and understood.", "2. SWM challenges are identified." and "3. Measures to tackle identified SWM challenges are proposed." The achievement level was considered as 80% due to the following reasons.

Indicators	Achievement level : 85%
1. Current SWM situation is technically as well as quantitatively analyzed and understood.	In 2017, the first year of the project, a series of SWM baseline surveys were conducted in each state with government officials in charge of waste management, such as waste amount and composition survey, incoming waste amount survey, and public opinion survey to residents. The results were compiled as waste flows and shared among all key officials involved.
2. SWM challenges are identified.	Based on the waste flow analysis, waste management issues that need to be urgently addressed in each state were identified quantitatively and technically, and such priority issues were widely shared among stakeholders.
3. Measures to tackle identified SWM challenges are proposed.	Along with the priority issues identified above, the strategy also includes an action plan (for each priority issue, with detailed activities and budgets), the contents of which were also shared with all concerned. From this series of activities, it can be said that the achievement of the project purpose in terms of indicators is good, however, the achievement level is set at 85% because the achievement status of Output 3 is not 100%..

3.3.4 Recommendations to Achieve Overall Goal

The project has the same overall goal listed below for all J-PRISM II countries.

- **(Region-wise)** Sustainable management of solid waste in the Pacific region is enhanced based on Pacific Regional Waste and Pollution Management Strategy 2016-2025 (Cleaner Pacific 2025)

Although no indicators have been established to measure the achievement of the overall goal, In

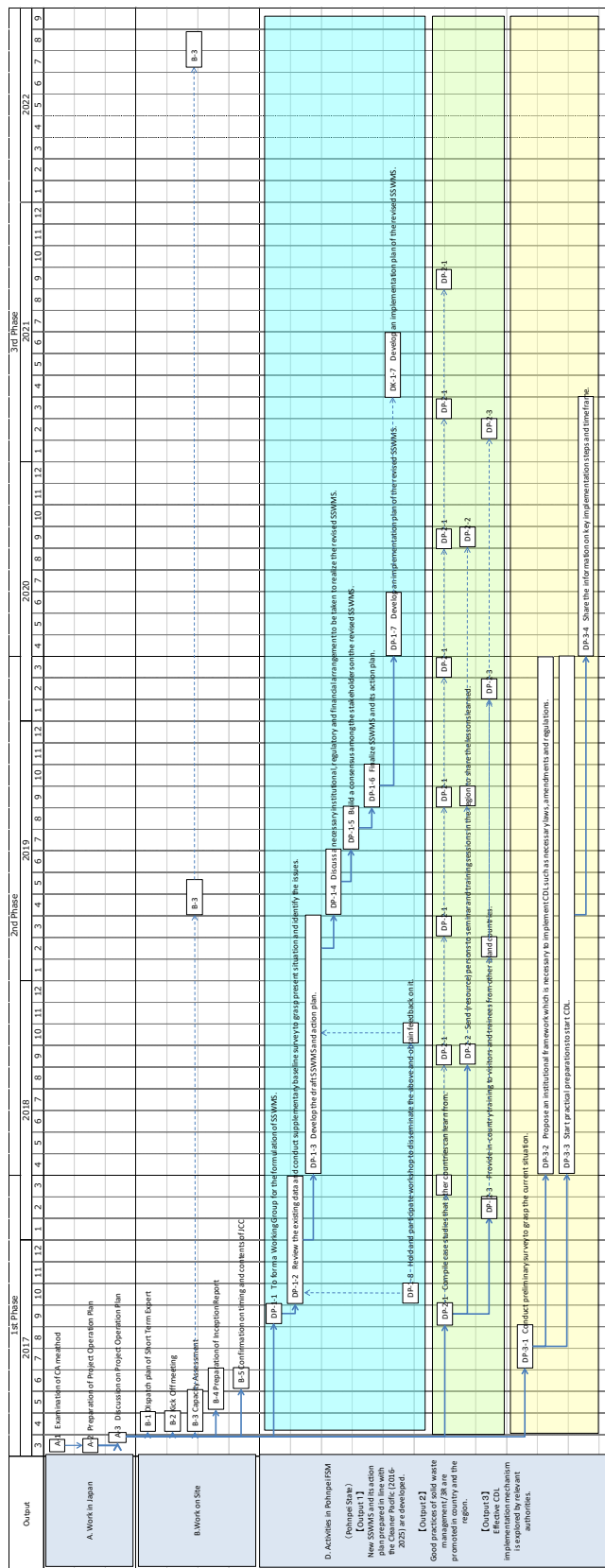
FSM as a country, the achievement level of project purpose is satisfactory, which is a significant contribution to the strengthening of self-sustaining waste management in the Oceania region.

3.3.5 Means and Lesson Learnt from the Project

- SSWMS of Chuuk is formally endorsed by the governor on 29 June 2018.
- In addition to amend the law, it is prerequisite to procure the recycling equipment and secure the enough seed money in order to start CDL system. It is worth noting that the C/P agency has procured two press machines with support from the Grass Root Grant Aid. As for the seed money, it is necessary to continue discussions with the C/P agencies as well as the State Government.

3.4 Pohnpei State (Pohnpei)

3.4.1 Project Flow Chart



3.4.2 Achievement of Outputs

Output 1: New SSWMS and its action plan prepared in line with the Cleaner Pacific (2016-2025) are developed.

Firstly, the waste flow of Pohnpei, the foundational tool to formulate the SSWMS, was drawn based on the SWM baseline survey (public opinion survey on waste discharge manner, waste amount and composition survey, incoming waste survey to the disposal site, etc.) conducted in July 2017. Through the waste flow analysis, key stakeholders understood the current SWM situations in Pohnpei technically as well as quantitatively.

While other three states proceeded formulating SSWMSs soon after the understanding on the current SWM situations, Pohnpei, where EPA had undergone frequent transfer and resignation of its staff was unable to do so. However the necessity of SSWMS of Pohnpei was confirmed at the second JCC meeting held on 11 October 2018 and thus J-PRISM II promised to support formulation of SSWMS of Pohnpei, too. Then, J-PRISM II expert along with counterpart officials conducted supplementary survey on SWM situations of each municipality in Pohnpei, organized regular stakeholders meetings, made presentations to the chairperson of EPA board as well as the Governor and finalized SSWMS of Pohnpei. The SSWMS was endorsed by the Governor on 29th Oct. 2019.

Indicator of Output 1	Achievement level : 100%
1-1 The SSWMS (final version) is submitted to the relevant authority	After the need for SSWMS formulation is confirmed at the second JCC meeting (11 October 2018), J-PRISM II experts and C/P officials have started its formulation since the end of February 2019. The first draft of SSWMS was presented by the Executive Director of EPA to the Governor and the chairperson of EPA board, and it is finally endorsed by the Governor on 29 th Oct. 2019.

Output 2: Good practices of solid waste management /3R are promoted in the country and the region.

This output consists of three activities, namely (i) Compile case studies that other states of FSM as well as other PICs can learn from, (ii) Send (resource) persons to seminar and training sessions in other states of FSM as well as in PICs to share the lessons learned, and (iii) Provide in-country training to visitors and trainees from other states of FSM as well as other PICs.

As for Activity 1, formulation of state waste management strategies based on waste flow analysis has been compiled as a good practice and uploaded to the SPREP website⁷. Unlike previous assistances provided by the J-PRISM or other donors, the waste management strategy was formulated with emphasizes on the importance of understanding the current conditions of SWM technically and quantitatively in order to set the strategic goals and activities.

As for Activity 2, the following opportunities were provided.

- The first SWM workshop in Pohnpei (September 27, 2017)
Mr. Henry Susaia, Mr. Alfred David, Mr. Brad Soram and Mr. Joseph Victor of EPA as well as Mr. Strick Silbanuz of T&I and Mr. Pius Yaropiyal of Pohnpei Waste Management Service (PWMS) participated in the workshop and Mr. Alfred David presented the result of SWM baseline survey of Pohnpei.

⁷ <https://www.sprep.org/j-prism-2/lessons-learnt>

- The Follow-up Seminar and On-site Training on Sanitary Landfill Design and Operation by Fukuoka Method in Palau (From February 2 – 5, 2018)
Mr. Pius Yaropiyal of PWMS participated in the above seminar.
- Regional Disaster Waste Management Guideline Development Consultation Workshop in Palau (From February 18 – 20, 2019)
Mr. Elmer David Jr. of EPA participated in the above workshop.
- The second SWM workshop in Pohnpei (September 26, 2019)
Mr. Henry Susaia, Mr. Brad Soram of EPA as well as Mr. Strick Silbanuz of T&I participated in and Mr. Brad Soram presented the issues regarding the current waste collection services of municipalities in Pohnpei.
- The On-Line Training for Proper Maintenance of Waste Collection Vehicles and Heavy Machineries (October 15, 2021)
This training was originally planned as an on-site training; however, due to the travel restrictions from the COVID-19, the training was converted to an on-line training. In a pre-consultation meeting held in June 2021, it was confirmed that the training should be held with all municipalities in cooperation with EPA. Some video clips, which serve as training materials, were submitted in September from the Kolonia Town Government (KTG) that JPSRIMS2 has been assisting to develop an improvement plan on its waste collection. The on-line training was held on October 15th with total of 12 participants from EPA and 6 municipalities including their drivers and mechanics.

Indicator of Output 2	Achievement level : 100%
<p>2-1 What is learned from the training organized by J-PRISM II Project Office is utilized.</p>	<p>In the 4 states of FSM, the current condition of the waste management was studied technically and quantitatively through a baseline survey. The waste management strategy and its subsequent priority activities were developed based on the result of actual baseline survey. By summarizing this experience as a good practice, it is expected to help if the waste management strategy needs to be reviewed in the future.</p> <p>As mentioned above, Mr. Pius Yaropiyal of PWMS participated in the Follow-up Seminar and On-site Training on Sanitary Landfill Design and Operation by Fukuoka Method in Palau, and Mr. Elmer David Jr. of EPA participated in Regional Disaster Waste Management Guideline Development Consultation Workshop in Palau. Mr. Pius who participated in the training on the final disposal site actually fabricated Eco-Fan which he learned how to make at the seminar and used it at the public disposal site in Pohnpei.</p> <p>In addition, many municipalities in Pohnpei have been provided with 4-ton compactor trucks through the Japanese grant aid program. The online training for proper maintenance of waste collection vehicles and heavy machineries, in which mechanics from these municipalities also participated, greatly contributed to the future maintenance and management of collection vehicles.</p>

Output 3: Effective CDL implementation mechanism is explored by relevant authorities.

In Pohnpei, CDL-related law was enacted in August 2011, and recycling of beverage containers has

begun. In August 2016, the law was successfully revised by changing the timing of deposit from retailing to customs filing.

However, unlike CDL of Yap and Kosrae, CDL of Pohnpei targets only aluminum cans, and those aluminum cans are purchased at the redemption centers only four or five times a year. There is a large room to improve the system in Pohnpei. Under such circumstances, the issues and problems of the current CDL system were widely shared and discussed at the second JCC meeting held on October 11, 2018, and the participants reconfirmed the need for its improvement. J-PRISM II promised to provide maximum support, too. The related activities implemented to date are as follows.

- Conduct a Preliminary Survey on Container Deposit Legislation for Pohnpei and Chuuk States of the FSM (Survey Period: 8 – 13 July 2017)

Examined the current CDL system and review the implementation status, estimated the number of cans and bottles consumed in Pohnpei based on the import data, and identified the issues. Finally, recommended how to improve the CDL system.

- Preparation of a new recycling center

In order to improve the system in Pohnpei, it is necessary to construct a new recycling center near the disposal site and furnish the new center with recycling equipment. EPA succeeded in obtaining the Grass Root Grant Aid of Japan and constructed a new recycling center in the corner of the final disposal site. Also, because of the need to procure large-scale recycling equipment, Also, EPA has successfully negotiated with the governor's office to procure the large press machine under the Non-Project Grant Aid, and the machine is now scheduled to arrive in Pohnpei by the end of the year 2021.

Indicator of Output 3	Achievement level : 70%
3-1 Guideline on implementation procedure such as measurement, accounting and data collection is prepared.	The second JCC held in October 2018 has provided momentum for CDL improvements; the construction of the recycling centers well as the procurement of recycling equipment, led by EPA, are well underway. In addition, the Pohnpei EPA has been briefed on the steps that need to be taken to improve CDL after the arrival of the equipment and materials in the future, through web meetings.

Others: Waste Management in Municipalities in Pohnpei

In the main island of Pohnpei, it is the local government's responsibility -- not the state government, to collect waste within their jurisdictions. Among the six municipalities, two municipalities, namely Madolenihmw Municipal Government locating far from the public disposal site and Kolonia Town Government (KTG) having the most populations on the island, face more serious problems. Embassy of Japan has already provided one 4-ton compactor to Madolenihmw Municipal Government. Likewise, two more compactor trucks were provided to the Kolonia Town Government in February 2022. With an help from a local consultant, J-PRISM assisted the Kolonia Town Government, in formulating a waste collection plan by effectively using the two newly provided compactor trucks.

Improving Waste Collection in Kolonia

[Background]

Steel containers (about 1.5m³) used in tuna fishery in Kosrae are transformed as garbage collection containers in Kolonia, causing a very inefficient and unhygienic waste collection practice. To

improve this situation, two compactor trucks were requested through the Grass-root Grant Aid from the Embassy of Japan that were delivered in February 2022. J-PRISM II assisted KTG, through the series of on-line meetings, in preparation of the waste collection improvement to realize efficient, safe, and sustainable waste collection and transportation.

[Details of the improvements]

Details of the plan and its related preparatory works are as follows.

- Study on locational information of existing containers (approx. 350 locations)
- Establishing (a) collection routes and (b) weekly collection schedule, based on the result of the above study and actual driving test.
- Replacing the steel containers with 780 32-gallon garbage bins with wheels by JICA. Numbered bins are distributed to each subscribing households/ business entities.
- Annual cost is estimated as US\$31,000, including fuel, vehicle maintenance, and labor cost.
- Garbage fee is \$5/month for household, \$2-/month for business entities, to cover the cost.
- A leaflet was prepared and being distributed for proper disposal methods, collection schedule, unaccepted items to prevent damages to the compactor trucks. Same content is broadcasted on the radio to further reach the public.
- Prepared a monitoring system using a vehicle operation monitoring sheet, which can record operation hours, travelling distance, fuel economy/amount re-fueled, and volume of waste collected.
- A hand-over ceremony and an on-line training on vehicle operation for KTG staffs by the manufacture were held on March 21 and June 22, respectively. The collection system is to be commenced as soon as the distribution of the new garbage bins, new contract with each household/business entity, and public awareness are completed.

3.4.3 Achievement of Project Purpose

The project has the following common regional and country-specific project purposes.

- **(Region-wise)** Human and institutional capacity base for sustainable Solid Waste Management in the Pacific region is strengthened through implementation of Cleaner Pacific 2025.
- **(FSM-Pohnpei)** Creation of solid waste management system is promoted.

The indicators to measure the achievement of project purpose of FSM-Pohnpei are "1. Current SWM situation is technically as well as quantitatively analyzed and understood.", "2. SWM challenges are identified." and "3. Measures to tackle identified SWM challenges are proposed." The achievement level was considered as 80% due to the following reasons.

Indicators	Achievement level : 85%
1. Current SWM situation is technically as well as quantitatively analyzed and understood.	In 2017, the first year of the project, a series of SWM baseline surveys were conducted in each state with government officials in charge of waste management, such as waste amount and composition survey, incoming waste amount survey, and public opinion survey to residents. The results were compiled as waste flows and shared among all key officials involved.
2. SWM challenges are	Based on the waste flow analysis, waste management issues

identified.	that need to be urgently addressed in each state were identified quantitatively and technically, and such priority issues were widely shared among stakeholders.
3. Measures to tackle identified SWM challenges are proposed.	<p>Along with the priority issues identified above, the strategy also includes an action plan (for each priority issue, with detailed activities and budgets), the contents of which were also shared with all concerned.</p> <p>From this series of activities, it can be said that the achievement of the project purpose in terms of indicators is good, however, the achievement level is set at 90% because the achievement status of Output 3 is not 100%.</p>

3.4.4 Recommendations to Achieve Overall Goal

The project has the same overall goal listed below for all J-PRISM II countries.

- **(Region-wise)** Sustainable management of solid waste in the Pacific region is enhanced based on Pacific Regional Waste and Pollution Management Strategy 2016-2025 (Cleaner Pacific 2025)

Although no indicators have been established to measure the achievement of the overall goal, In FSM as a country, the achievement level of project purpose is satisfactory, which is a significant contribution to the strengthening of self-sustaining waste management in the Oceania region.

3.4.5 Means and Lesson Learnt from the Project

- Pohnpei is a large state with a capital city of Palikir. In Pohnpei where collection and transportation of waste are duties of municipalities and the operation and management of the final disposal site are completely privatized, inevitably the involvement and commitment of the C/P agencies such as EPA and T&I had been lower than in other states. Thus, it cannot be said that C/P agencies recognized the need to formulate SSWMS and to improve CDL in the beginning. Under such circumstances, J-PRISM II first provided quantitative and technical information, and consulted with key stakeholders over time, so that stakeholders now can understand the need for SSWMS formulation and CDL improvement, and worked to foster the involvement and commitment of them.
- EPA Pohnpei is one of the C/P organizations whose involvement and commitment are enhanced tremendously through the above activities. For example, in relation to the construction of a recycling center, during the absence of experts, EPA proceeded with a procedure to change the purpose of land use with the governor's office and succeeded it. Also EPA has successfully negotiated with the governor's office and applied for the non-professional grant aid to procure the large-scale can press essential for CDL improvement. It indicates increasing ownership of the EPA, and deserves special mention.
- J-PRISM II has provided its support to improve collection in Kolonia. Although it is still extremely difficult to visit Kolonia due to the Covid-19, J-PRISM tries to provide support as much as possible even remotely by hiring experienced local people and holding frequent web meetings with them. The mayor of Kolonia and stakeholders have been very appreciative of this efforts.

3.5.2 Achievement of Outputs

Output 1: New SSWMS and its action plan prepared in line with the Cleaner Pacific (2016-2025) are developed.

Firstly, the waste flow of Kosrae, the foundational tool to formulate the SSWMS, was drawn based on the SWM baseline survey (public opinion survey on waste discharge manner, incoming waste survey to the disposal site, etc.) conducted in July 2017. Through the waste flow analysis, key stakeholders understood the current SWM situations in Kosrae technically as well as quantitatively. Then, from January to February 2018, SWM challenges that should be taken as the strategic activities were identified at weekly stakeholder meetings, and are compiled as SSWMS and the attached Action Plan. On 16 February 2018, a workshop was held to provide the participants with the information on the essence of the SSWMS. After active questions and answers on the contents of SSWMS at the workshop, SSWMS (draft) was finalized.

Subsequently, Kosrae SSWMS was approved on 28 May 2018 by the Governor. It is the first SSWMS officially endorsed. It is worth mentioning that the EPA successfully negotiated with the fund manager of the US Compact Fund based on the approved SSWMS and obtained budgets for improvement of waste collection services.

Indicator of Output 1	Achievement level : 100%
1-1 The SSWMS (final version) is submitted to the relevant authority	Stakeholders were gathered, SSWMS and its Action Plan were explained to the stakeholders at a workshop held on 16 February 2018, and SSWMS (draft) was agreed after questions and answers. Then it was approved by the governor on 28 May 2018.

Output 2: Good practices of solid waste management /3R are promoted in the country and the region.

This output consists of three activities, namely (i) Compile case studies that other states of FSM as well as other PICs can learn from, (ii) Send (resource) persons to seminar and training sessions in other states of FSM as well as in PICs to share the lessons learned, and (iii) Provide in-country training to visitors and trainees from other states of FSM as well as other PICs. As for Activity 1, formulation of state waste management strategies based on waste flow analysis has been compiled as a good practice and uploaded to the SPREP website⁸. Unlike previous assistances provided by the J-PRISM or other donors, the waste management strategy was formulated with emphasizes on the importance of understanding the current conditions of SWM technically and quantitatively in order to set the strategic goals and activities. In addition, for Kosrae, the successful introduction of inter-municipal collection system, the third output produced by the project, was also compiled as a good practice.

As for Activity 2, the following opportunities were provided.

- The first SWM workshop in Pohnpei (September 27, 2017)
Mr. Blair Charley, Mr. Kiobu K. Luey of KIRMA as well as Mr. Bob Skilling of DT&I participated in and presented the result of SWM baseline survey of Kosrae.
- The Follow-up Seminar and On-site Training on Sanitary Landfill Design and Operation by Fukuoka Method in Palau (From February 2 – 5, 2018)

⁸ <https://www.sprep.org/j-prism-2/lessons-learnt>

Mr. Osamu Nedlic of DT&I participated in the above seminar.

- Regional Disaster Waste Management Guideline Development Consultation Workshop in Palau (From February 18 – 20, 2019)

Mr. Kiobu K. Luey of KIRMA participated in the above workshop.

- The second SWM workshop in Pohnpei (September 26, 2019)

Mr. Blair Charley of KIRMA, and Mr. Hairom Livaie of DT&I participated in and presented the Inter-Municipal Collection System (IMCS).

- Inter-Municipal Collection System (IMCS) was introduced as an example of good practice case.

- On-line training for proper maintenance of waste collection vehicles and heavy machineries (July 2nd, 2021 / On-line)

Originally the training was planned as a regional cooperation training by the project office based on Output 2 activity with collaboration with G1. This training was initially designed to be held in Kosrae, FSM in which trainees were invited from 3 countries in Micronesia region in June 2020; however, the COVID-19 related travel restrictions caused the trainings to be modified and carried out as on-line session. The JICA project office informed the counterpart about the on-line training in April, and more detailed explanation and procedures, including how and what to take video clips in ordinary maintenance work, were explained during regular web meeting in June. On July 2nd, the first on-line training was carried out based on the video clips that counterparts took and submitted to a J-PRISM II trainer. Following participants attended to the training: Mr. Hairom Livaie (Director of DT&I), Mr. Likiyak Malendar (Administratoor for DT&I), Mr. Nilson Nena (Truck Driver), Mr. Ralph Talley (Landfill attendant).

Indicator of Output 2	Achievement level : 100%
2-1 What is learned from the training organized by J-PRISM II Project Office is utilized.	<p>In the 4 states of FSM, the current condition of the waste management was studied technically and quantitatively through a baseline survey. The waste management strategy and its subsequent priority activities were developed based on the result of actual baseline survey. By summarizing this experience as a good practice, it is expected to help if the waste management strategy needs to be reviewed in the future.</p> <p>As mentioned above, Mr. Osamu Nedlic of DT&I participated in the Follow-up Seminar and On-site Training on Sanitary Landfill Design and Operation by Fukuoka Method in Palau, and Mr. Kiobu K. Luey of KIRMA participated in Regional Disaster Waste Management Guideline Development Consultation Workshop in Palau. DT&I used knowledge gained from the training on landfill design and operation to raise the embankment (access road) and secure increased landfilling capacity.</p> <p>For on-line training for proper maintenance of collection vehicles and heavy machineries, it was agreed to revise an inspection check list and re-shoot training video, indicating improvements were made through the training session.</p>

Output 3: Waste collection is improved in Kosrae.

Kosrae where four municipalities are responsible for waste collection has been suffering from increasing illegal dumping and littering since some municipalities with weak financial basis fail to provide regular collection services. Thus, this output aiming to improve waste collection services in Kosrae was set.

At the second JCC meeting held on 4 October 2018, the experts of J-PRISM II explained and recommended the introduction of Inter-Municipal Collection System (IMCS) as means to improve waste collection system drastically. Following this proposal, key stakeholders of Kosrae including the mayors of four municipalities gathered together on 25 October 2018 and decided to introduce the IMCS.

Outline of the Inter-Municipal Collection System (IMCS)	
Collection vehicle :	Four-ton compactor truck (is provided through the Non-Project Grant Aid in October 2019)
Waste amount	18 tons per week in the entire state
Collection cost	Total=1,300\$/month (@16,000\$/year)
Breakdown	Fuel=400\$/month (4,800\$/year) Maintenance=40\$/month (480\$/year) Labor=900\$/month (10,800\$/year)

Then, in February, May, August, November 2019, and January and February 2020, the experts visited Kosrae again and started detailed discussion on IMCS such as “who collects waste and who maintains collection vehicles,” “how to secure the budget to run IMCS” and “which collection systems to be employed.” The outline of IMCS and result of monitoring activity are as follows.

a. Inter-Municipal Collection System

- Waste collection and maintenance of the collection vehicle
 - DT&I is decided to be the executing body for operation and management of IMCS.
 - State Cord was amended to establish Division of Solid Waste Management, provide waste collection services, and maintain collection vehicles under DT&I.
- Securing necessary budget to cover the collection cost
 - Necessary expenses are estimated at US\$16,000 a year, including fuel, maintenance and labor costs.
 - It was decided that the state government (DT&I) bear US\$10,000- which is equivalent to the labor cost, and remaining US\$6,000- will be shared among the 4 municipalities according to their population size.
- Basic Collection System
 - Basically, curbside collection combined with bell (sound) collection system is introduced.
 - For the area difficult to access by the 4 ton compactor truck provided by Non-Project Grant Aid in late 2019, municipal trucks continued to collect waste from residents and transfer it to the compactor truck.
 - Discharging containers are 34gallon wheeler bins with lids (in some area the bins are placed in steel platform). Local NGO has assisted Malem Municipality to provide the bins to its residents while KIRMA purchased the bins using the US Comact Fund and distributed to all households.
 - The collection frequency is once in a week.

b. Implementation of IMCS

IMCS started on February 10, 2020. From the result of monitoring of IMCS during the first week of IMCS, Feb. 10th to 14th, following issues and points to consider are observed.

- Start-up inspection
 - The driver and the administrator responsible for the garage worked together to conduct the daily inspection for the compactor trucks according to the start-up inspection checklist before starting the collection work. The inspection procedure has improved daily, and the compactor truck can now be departed almost on time.
- Coordinating with Municipality Collection
 - Each of the 4 municipalities has areas where the compactor truck cannot enter, so the municipality's collection vehicles continue to cover those areas. The time and location to transfer the waste from municipal truck to the compactor truck were decided for each municipality so that the municipalities do not have to transport the waste all the way to the dumpsite in Tofol. In the first week of collection, the transferring waste were done in the middle of collection in Lelu, at the start of collection activity in Tafunsak and Utwe. For Malem, it was confirmed that the transfer will be done in a designated location once in every two weeks.
- Municipal staff promote IMCS and giving guidance to residents
 - At the time of the first IMCS collection, municipal staff were asked to guide the households to be collected. At the same time, the municipal official (mayor himself for Utwe) provided guidance to residents on the waste discharge manner and promoted them to pay the waste collection fee. In municipality where collection of fees is relatively weak, the waste collection work was provided for promotional purpose to even those households that had not paid the fee.
- Inappropriate waste
 - Residents were notified of inappropriate waste that could damage the compactor truck, including cartridge gas cans. It is necessary to patiently inform the residents to gain understanding what is acceptable and what is not inappropriate to discharge.
- Sound system
 - At the time of waste collection, a local music that sings about Kosrae's beauty is played, signaling the arrival of the collection truck. Although some residents complained of being noisy, it was generally well received by the residents.
- End of work inspection
 - The compactor truck is equipped with a simple cleaning device. The body is washed at the end of day when the last waste is dumped at the dump site.
- Result of quantitative monitoring
 - Lelu and Tafunsak required two trips, while Malem and Utwe finished collection in one morning trip. From the result of one week of waste collection, it can be said that the collection day was decided appropriately. However, data accumulated in the future may suggest to revise the collection day and thus careful monitoring is necessary.
 - The mileage per week was about 160 km (100 miles), fuel (diesel) consumption was 25 gallon (95 liter), and fuel consumption was 6.3 km / gallon (3.9 mile / gallon, 1.7 liter / km). The fuel consumption was almost as expected. Estimate annual fuel cost will be monitored.
 - Total collected waste per week was 11 tons / week. The volume of waste discharged at the time of the baseline survey was estimated to be 1.22 tons / day, and the weekly discharge were estimated to be 8.5 tons. Therefore, it can be said that the amount collected at the IMCS was 1.3 times more than that of the baseline survey.

- Monitoring result of IMCS implementation (up to September 2020)

Since the commencement of IMCS, DT&I that manages the waste collection has been monitoring IMCS operations, including collection schedule, collection time, travelling distance, and fuel usage. Result of a 1/2 year monitoring up to September 2020 is as follows:

 - Estimation of fuel cost for an entire year, based on a half year data, is US\$2,700- / year. This cost is lower than originally estimated cost that include maintenance cost. The reason is most likely that the vehicle is still new and did not require much maintenance cost. Considering the fact that the vehicle will age eventually the cost will increase proportionally and thus original estimation was rather valid as the maintenance cost will increase in future.
 - Contributions from each municipality is paid by actual goods (diesel fuel) which has been paid according to plan, although delays in payment have observed from some municipality.
 - Based on the number of garbage bins counted by a driver, 30% increase was observed compare to waste collected in baseline survey in 2017, indicating IMSC has been operated properly.

In the 5th JCC meeting held in June 2022, Mr. Hairom Livaie, the director of DT&I, reported that IMCS has been smoothly operated and managed. As for the achievement level, it can be summarized as follows.

Indicator of Output 3	Achievement level : 100%
3-1 A waste collection plan is implemented in some area.	<p>Based on the IMCS, public awareness raising activity mainly done by KIRMA, training for collection crew and preparation for collection routes, and installation of the sound system by DT&I, are all performed in coordination to relevant bodies. IMCS was started in entire state on February 10, 2020 after all those planning and preparation work. Even though the monitoring data is for the first week of IMCS only, the total volume of waste collected was 11 tons per week. If compared to the waste volume in baseline survey which was 8.5 ton/week (1.22ton/day), IMCS collection was approximately 1.3 times more than the baseline survey.</p> <p>From the monitoring result as of September 2020 and discussions in web meetings, it is confirmed that IMCS has been technically and financially operated properly.</p> <p>In the 5th JCC held in June 2022, Mr. Hairom Livaie, the director of DT&I, presented the background and how IMCS has been operated, indicating that the waste collection improvement plan has been put into practice and well accepted by residents.</p>

Other: Improvement of the landfill site

Since IMCS has been successfully introduced, the volume of waste brought into the landfill is most certainly increased as waste stream from area previously not collected are entering the landfill as well as the waste stream going into illegal dumping were decreased. In response, DT&I is increasing the landfilling capacity by changing a gate location to allow vehicles to enter the landfill from the street directly and constructing an embankment around the site. As stated earlier, this practice is a direct accomplishment from knowledge gained from the landfill management training in Palau, as well as introduction of IMCS based on the waste management strategy, and well-planned waste management practice.

3.5.3 Achievement of Project Purpose

The project has the following common regional and country-specific project purposes.

- **(Region-wise)** Human and institutional capacity base for sustainable Solid Waste Management in the Pacific region is strengthened through implementation of Cleaner Pacific 2025.
- **(FSM-Kosrae)** Creation of solid waste management system is promoted.

The indicators to measure the achievement of project purpose of FSM-Kosrae are "1. Current SWM situation is technically as well as quantitatively analyzed and understood.", "2. SWM challenges are identified." and "3. Measures to tackle identified SWM challenges are proposed." The achievement level was considered as 80% due to the following reasons.

Indicators	Achievement level : 100%
1. Current SWM situation is technically as well as quantitatively analyzed and understood.	In 2017, the first year of the project, a series of SWM baseline surveys were conducted in each state with government officials in charge of waste management, such as waste amount and composition survey, incoming waste amount survey, and public opinion survey to residents. The results were compiled as waste flows and shared among all key officials involved.
2. SWM challenges are identified.	Based on the waste flow analysis, waste management issues that need to be urgently addressed in each state were identified quantitatively and technically, and such priority issues were widely shared among stakeholders.
3. Measures to tackle identified SWM challenges are proposed.	Along with the priority issues identified above, the strategy also includes an action plan (for each priority issue, with detailed activities and budgets), the contents of which were also shared with all concerned. In Kosrae, collection improvement was identified as one of the challenges, and inter-municipal collection has actually been introduced as a solution.

3.5.4 Recommendations to Achieve Overall Goal

The project has the same overall goal listed below for all J-PRISM II countries.

- **(Region-wise)** Sustainable management of solid waste in the Pacific region is enhanced based on Pacific Regional Waste and Pollution Management Strategy 2016-2025 (Cleaner Pacific 2025)

Although no indicators have been established to measure the achievement of the overall goal, In FSM as a country, the achievement level of project purpose is satisfactory, which is a significant contribution to the strengthening of self-sustaining waste management in the Oceania region.

3.5.5 Means and Lesson Learnt from the Project

- Kosrae SSWMS was approved on 28 May 2018 by the Governor. It is the first SSWMS officially endorsed in FSM. It is worth mentioning that the EPA successfully negotiated with the fund manager of the US Compact Fund based on the approved SSWMS and obtained budgets for improvement of waste collection services.
- In Kosrae, the improvement of waste collection as outlined in Output 3 is the most important activities. After conducting supplementary surveys on the collection situation and collection routes in each municipality, the expert team proposed IMCS using four-ton compactor truck provided by Non-Project Grant Aid. The realization of this proposal requires the system

building that includes legal and budgetary measures, so the agreement and commitment of the parties concerned are extremely important. In view of these circumstances, the expert team decided to just propose wide-area collection at the second JCC meeting and wait for key stakeholders to build and reach the consensus on the issue. In fact, KIRMA and DT&I have gathered all local government officials and NGO officials, discussed with them even during the absence of the expert team, and reached an agreement on the introduction of regional collection. Encouraging them to form a consensus and taking the attitude of waiting had a beneficial effect on subsequent activities. Based upon the decision, amendment of the state code for adding duties in DT&I was proceeded, and on November 21, 2019, the state code was amended to establish Division of Solid Waste Management and DT&I became the executing body for IMCS operation and management. Furthermore, with this revision DT&I are now able to secure labor cost of US\$10,000- for 3 landfill operators (concurrent position as collection crew) in their ordinary budget. Among the US\$16,000-, US\$10,000- which is equivalent to the labor cost is beard by the state (DT&I) with the amendment of the state code while remaining US\$6,000- is shared among 4 municipalities based upon population size. DT&I and each municipalities concluded Memorandum of Understanding (MoU).

- Since the decision was made to introduce IMCS by relevant bodies in Kosrae in October 2018, it took approximately one and half year to commence the actual IMCS in February 2020. During this time, all of the relevant bodies, namely KIRMA, DT&I, and 4 municipalities, played their respective roles and closely coordinated to reach the realization of IMCS. More precisely, KIRMA successfully secure necessary fund from US Compact Fund using SSWM as negotiating tool to purchase waste bins and platform. Moreover, KIRMA developed brochure and sticker to raise public awareness and held community meetings in coordination with 4 municipalities to actively persuade public to participate in IMCS. As for DT&I, duties for waste management was introduced in DT&I's responsibilities through amending the state code and become the executing body for the IMCS. Labor cost for 3 collection crew is also secured as normal budget of DT&I. Furthermore, training for operation and maintenance of compactor truck for collection crew, daily inspections and safety trainings, clearing powerlines and phone lines that may obstruct operation of the tuck on the collection route, as well as installation of the sound system was carried out.
- A monitoring system was developed in a way that a driver record collection schedule, collection time, travel distance, fuel usage, and (if continually possible) number of waste bins collected, and then the data is sent to DT&I office where data is entered into a database and analyzed. As a result, the condition of IMCS implementation is qualitatively monitored.
- As for the on-line training for proper management of collection vehicles and heavy machineries, it was originally planned to invite counterpart personnel from 3 Micronesian countries to the State of Kosrae; nonetheless, COVID-19 resulted travel restrictions prohibited this plan to realize, thus carrying out the training on-line was sought.
- In order to encourage trainees' initiatives, following procedures were taken:
 1. The trainees take video clips for their usual maintenance works, including daily inspection, regular maintenance and repair works, and submit the video clips to JRISM II.
 2. Initially it was assumed to have few pre-training sessions where the trainees would be asked to re-shoot the video clips based on review/recommendations from J-PRISM II side in biweekly meetings or e-mails. However, the submitted video clip was already in the satisfactory level to start the training, and the 1st video clip was used as training material.

3. Based on 1 and 2 above, the training was carried out in consultation style where the trainer points out a) things that can be improved, b) things that deserves high evaluation, and c) other comments to give comprehensive feedback while participants watched the video clips. For example, the trainer called attention to identifying faults which could lead to a serious accident. Also, the inspection checklists that the trainees use were recommended to be revised to add some points that trainees learnt through the lecture. The trainees understood the importance and agreed to revise the checklist and re-shoot the video clip in order to carry out the proper maintenance.
- The training is basically targeted for 3 countries 4 states in Micronesia, but regional or long-term program should be considered based on the result of the 1st stage of this on-line training effort.
 - DT&I, responsible for management and operation of the landfill site, is using knowledge gained in the regional training to raise the height of embankment (access road) to secure the disposal capacity.

4.2 Achievement of Outputs

Output 1: Policy documents necessary to improve SWM system are officially submitted to the relevant authorities.

The SWM baseline survey was conducted from Jul. to Aug. 2017. Survey items include incoming waste amount survey to the disposal site, public opinion survey on waste discharge manner and so on, to create a waste flow. The current SWM situations in Majuro and Ebeye were analyzed technically and quantitatively based on the waste flows and results were shared among stakeholders through meetings. Based on the analyzed data, policy documents (SWMP for MAWC, SWMP for KALGOV) were formulated.

SWMP for MAWC

Several feasibility studies targeting Majuro⁹ are under progress but it will take time to make a political decision. Therefore, SWMP for MAWC is formulated simultaneously and draft final version was completed. New government was formed in Jan, 2020 and it was presented by the C/P to the new government and was approved in 28 July 2020 by the Minister.

SWMP for KALGOV

Formulation of SWMP for KALGOV was commenced in June 2018. Through a series of intensive discussions with key stakeholders of Ebeye, a draft plan was completed in July 2018. SWMP for KALGOV was finalized during STC meeting in Fiji in August 2018 and finally approved by the Mayor on 18th October 2018.

National WM Strategy (NWMS)

At the beginning of the project, SPREP was assisting OEPPC to formulate NWMS. In the section of SWM of the NWMS, the result of baseline survey which counterpart officials and experts conducted together, were refereed. Outline of NWMS was presented by OEPPC during the second JCC meeting in February 2019. However, a subsequent restructuring of the government structure resulted in the EPA being changed as the formulating authority for the Strategy, but the work was stalled as it was not a priority for the EPA to formulate the national strategy on waste management.

Indicators for output 1	Achievement Level: 80 %
[Majuro] 1-1. The SWM Plan for MAWC (final version) is submitted to the relevant authority.	Several feasibility studies targeting Majuro were under progress, but it took time to make decisions by political leaders. Therefore, SWMP for MAWC was formulated simultaneously. After the new government was formed in January 2020, and the C/P in Majuro presented its contents to the newly appointed Minister of MWIU and will be approved in on 28 July 2020.
[Ebeye] 1-2. The SWM Plan for KALGOV (final version) is submitted to the relevant authority.	SWMP for KALGOV (name of plan is “Kwajalein Atoll Solid Waste Management Plan”) was approved by the Mayor on 18 th October 2018. The outline of SWMP for KALGOV was also presented at the City Council meeting by EPA official at the time.

⁹ Waste to energy project under ADB funded “Majuro Power Network Strengthening”, RDF production facilities under waste to energy project, Electricity Roadmap Project by New Zealand Aid Program where wastes become energy sources for the project.

<p>[National] 1-3. The NWMS (final version) in line with CP2025 is formulated and submitted to the Cabinet.</p>	<p>OEPPC is formulating NWMS with assistance of SPREP. It was planned that OEPPC, with support from SPREP, would develop it and complete the Final Draft by May 2019, but due to a reorganization, the organization in charge of strategy development was changed to EPA and the work was frozen due to the lower priority given to the development of the strategy by EPA.</p>
---	---

Output 2: Good practices of solid waste management /3R are promoted in the country and the region.

Output 2 will be achieved through 4 activities which are “Activity 1: Compile case studies that other countries can learn from”, “Activity 2: Send (resource) persons to seminar and training sessions in the region to share the lessons learned” and “Activity 3: Provide in-country training to visitors and trainees from other island countries”. Regarding Activity 1, the CDL system started in July 2018 as well as the expansion of the final disposal site to the lagoon side have been compiled as good practices of the RMI and uploaded on the SPREP website¹⁰.

As for activities 2, counterparts are actively participating in workshops and seminars as described below.

- Training on Sanitary Landfill Design and Operation by Fukuoka Method (Feb. 2017/Palau)
Ms. Jacqueline Lakmis of MAWC from Majuro and Mr. Wesley D. Lemari of KALGOV from Ebeye participated.
- Regional Disaster Waste Management Guideline development consultation workshop (Feb. 2019/Palau)
Three counterpart officials from Majuro, Mr. Kenny Paul, Ms. Jacqueline Lakmis and Mr. Timmy Langrine, and two officials from Ebeye, Mr. Scott B. Paul and Ms. Abacca Anjain Maddison, participated.
- On-Line Training for Proper Maintenance of Waste Collection Vehicles and Heavy Machineries (April 2021 - / On-line)
Due to travel restrictions from COVID-19, the training which was originally planned as on-site training was modified into on-line training. The JICA project office informed the counterpart about the on-line training in April, and more detailed explanation and procedures, including how to shoot video clips during ordinary maintenance work which will become bases for training materials, were explained during regular web meeting in June. On 15 October and 5 December, 13 vehicle and heavy equipment operators and mechanics actively participated in online training, with preventive maintenance as the main topic.

Indicators for Output 2	Achievement Level: 100 %
2-1. What is learned from the training organized by J-PRISM (II) Project Office is utilized.	As mentioned before, “the Follow-up Seminar and On-site Training on Sanitary Landfill Design and Operation by Fukuoka Method” was conducted at Palau and one official from Majuro and one official from Ebeye participated. Also, “Regional Disaster Waste Management Workshop” was conducted at Palau and three officials from Majuro and two

¹⁰ <https://www.sprep.org/j-prism-2/lessons-learnt>

	<p>officials from Ebeye participated.</p> <p>Regarding the final disposal site, the situation was such that an Emergency Proclamation was issued, and therefore it is difficult to apply what have learned at <i>Training on Sanitary Landfill Design and Operation by Fukuoka Method</i> in Majuro. Also, it is difficult to do so in Ebeye too, since the disposal site is partially submerged during the spring tide. However, as for the disaster waste management, Mr. Scott Paul who attended the <i>Regional Disaster Waste Management Guideline development consultation workshop</i> is willing to secure the budget for that.</p> <p>Regarding online training for the proper maintenance and management of waste collection vehicles and heavy machinery, after a series of preparatory meetings, the actual training took place on 15 October 2021 and 5 December, with 13 drivers and mechanics actively participating and using the training in their daily work.</p>
--	---

Output 3: CDL mechanisms suitable to RMI are explored by relevant authorities.

J-PRISM II has supported smooth implementation of CDL since the beginning of the project in 2017 continuously. Main activities carried out so far are as follows.

Support for CDL introduction at the national level (Formulation of laws and regulations)

- Conducted the preliminary survey of CDL in RMI (August 2017) and identified the need to amend the legislation (P.L. 2016-17 Styrofoam Cups and Plates and Plastic Products Prohibition and Container Deposit Act) first
- Assisted EPA to draft amendments, and the amendments was approved at the Nitijela in January 2018.
- Assisted EPA to formulate the recycling program regulations which specify details such as deposit and refund amount and this was approved by the Cabinet in June 2018. During the course, the expert assisted EPA officials at public hearings on the regulations.

Support for CDL introduction at both Majuro and Ebeye (Deposit collection)

- Organized meetings with members of the chamber of commerce to explain the outline of CDL system such as target containers, deposit amount and method of collecting deposits.
- Organized meetings with custom officers to explain the outline of CDL system and trained them on how to collect deposits and how to aggregate the deposited amount.

Support for CDL introduction at Majuro (Operation of the redemption center)

- Provided assistance to MAWC officials in calculating number of containers, accounting and claiming to MOF.
- Provided assistance to EPA to draft MOU to appoint MAWC as a system operator to run a redemption center for CDL.

Following the development of the legal system, the collection of deposits at customs had started in July 2018. In addition, an opening ceremony for the CDL was subsequently held at the MAWC on 10 August 2018 with the President, and the actual purchase of the CDL started three days later, on 13 August. Since the start of the buy-back in August 2018, the CDL operation has been running smoothly.

CDL operation in Ebeye was commenced on Jun 2021 upon the technical assistance by J-PRISM II and sharing experience in Majuro. The operation is currently suspended due to a breakdown of the can compressor.

Indicators for Output 3	Achievement Level: 100 %
<p>3-1. Guideline on implementation procedure such as measurement, accounting and data collection is prepared.</p>	<p>The amendment to the "Styrofoam Cups and Plates, and Plastic Products Prohibition, and Container Deposit Act 2016" was passed at the Nitijela in January 2018, and the CDL Regulations in line with the amendment was approved by the Cabinet in June 2018.</p> <p>As a result, deposit collections at custom office started in July 2018, the opening ceremony at MAWC with attendance of the President was held in 10th August 2018, refunds and recycling at redemption center located at final disposal site started in 13th August 2018.</p> <p>As of Jun 2022, CDL operation in MAWC is conducting smoothly.</p>

Others: Improvement of Final Disposal Site

Technical assistance on improvement of final disposal site in Majuro was conducted. At first, aerial photos of the final disposal site were taken by the drone and 3 dimensional drawings with contour line were developed in order to share the current situation of the final disposal site with counterpart officials. Based on some scenarios, the remaining life periods of current final disposal site was estimated and presented.

New government was formed in Jan 2020. Intension to improve the situation of final disposal site seems to be very high that the new government designated existing Batkan disposal site as Emergency Area and instructed to relevant authority to take necessary measures to overcome the problems.

MWU proposed following three countermeasures.

- 1) Construct sea wall at shallow lagoon opposite side of Batkan disposal site and reclaim land for extension of current disposal site.(Short term solution)
- 2) Construct sea wall at ocean side of current disposal site and extend landfill area.(Mid term solution)
- 3) Construct new final disposal site.(Long term solution)

J-PRISM II provided regular technical assistance remotely towards the realization of (1) and (2) above. As for the 1) above, construction of sea wall at cell no1 was commenced early 2020 and completed January 2021. Upon the approval of EPA for using landfill operation, it is commenced to start operation in March 2021. Before starting landfilling operation, sea water sample was taken and send for water quality test including heavy metals. Therefore baseline data was recorded and periodical water quality test will be carried out by EPA. As of May 2022, Cell 1 is almost full and

will be followed by the start of landfilling of Cell 2.

As for the 2) above, the contractor for the Sea Wall has been selected through a tender and construction work is being carried out by the selected contractor. After Cell 2 above is full, landfilling between the Sea Wall and the land is scheduled to start.

4.3 Achievement of Project Purpose

The project has the following common regional and country-specific project purposes.

- **(Region-wise)** Human and institutional capacity base for sustainable Solid Waste Management in the Pacific region is strengthened through implementation of Cleaner Pacific 2025.
- **(RMI)** Creation of solid waste management system is promoted.

The indicators to measure the achievement of project purpose of RMI are "1. Current SWM situation is technically as well as quantitatively analyzed and understood.", "2. SWM challenges are identified." and "3. Measures to tackle identified SWM challenges are proposed." The achievement level was considered as 80% due to the following reasons.

Indicators	Achievement level : 90%
1. Current SWM situation is technically as well as quantitatively analyzed and understood.	In 2017, the first year of the project, a series of SWM baseline surveys were conducted in each state with government officials in charge of waste management, such as waste amount and composition survey, incoming waste amount survey, and public opinion survey to residents. The results were compiled as waste flows and shared among all key officials involved.
2. SWM challenges are identified.	Based on the waste flow analysis, waste management issues that need to be urgently addressed in each state were identified quantitatively and technically, and such priority issues were widely shared among stakeholders.
3. Measures to tackle identified SWM challenges are proposed.	Along with the priority issues identified above, the strategy also includes an action plan (for each priority issue, with detailed activities and budgets), the contents of which were also shared with all concerned. From this series of activities, it can be said that the achievement of the project purpose in terms of indicators is good, however, the achievement level is set at 90% because the achievement status of Output 3 is not 100%.

4.4 Recommendations to Achieve Overall Goal

The project has the same overall goal listed below for all J-PRISM II countries.

- **(Region-wise)** Sustainable management of solid waste in the Pacific region is enhanced based on Pacific Regional Waste and Pollution Management Strategy 2016-2025 (Cleaner Pacific 2025)

Although no indicators have been established to measure the achievement of the overall goal, In RMI, the achievement level of project purpose is satisfactory, which is a significant contribution to the strengthening of self-sustaining waste management in the Oceania region.

4.5 Means and Lesson Learnt from the Project

- As for Output 1, in Majuro, there was discussion of various waste to energy projects, and it was discussed whether it would be better to wait to start supporting the development of a waste management plan for MAWC until that direction had been decided. In fact, the postponement of support for the development of MAWC's waste management plan was agreed at a stakeholders' meeting in May 2018, which was preceded by support for the development of KALGOV's waste management plan. Formulation of SWMP for KALGOV was commenced in June 2018. Through a series of intensive discussions with key stakeholders of Ebeye, a draft plan was completed in July 2018. SWMP for KALGOV was finalized during STC meeting in Fiji in August 2018 and finally approved by the Mayor on 18th October 2018.
- As for Output 1, once postponed, the MAWC waste management plan, but due to the lack of progress in various waste to energy projects in Majuro, it was agreed at the second JCC in February 2019 to start supporting the development of a waste management plan for MAWC from May 2019 onwards. Upon the completion of SWMP for MAWC, new government was formed in Jan, 2020 and it was presented by the C/P to the new government and was approved in 28 July 2020 by the Minister.
- Output 3 is a newly added output in response to a strong request from EPA at the first JCC meeting. Upon the careful preparations, CDL has commenced in August 2018 and a lot of aluminium cans, PET and glass bottles were returned back to the redemption centre. It is highly commendable that littering at streets were reduced tremendously and contributed beatification of the living areas. Among collected items, aluminium cans were compressed and exported several times by now. However, due to the Chinese prohibition of importing waste plastics from overseas since the end of 2018, there is no buyer for returned PET bottles and it is quite difficult to ship out from RMI at this moment. There is no other problems encounters and CDL operation is conducting smoothly as of Jun.2022.
- The long-standing problem of the existing final disposal site in Majuro, where waste is piling up higher and higher, far exceeding its capacity, has been set out the prospects for a solution through the use of a new sea-front landfill, and by securing a new disposal site on the inner surface where the waves are calmer. In reclaiming the sea surface, a Sea Wall and fence were first constructed to clearly delineate the boundary with the sea surface and prevent litter from being landfilled into the sea. Furthermore, the purifying effect of coral sand is expected to prevent water pollution of seawater. By stopping landfill at the height of the surrounding ground, it is expected that it will be easier than before to secure a site for a new disposal site, as there will be more options for site use after closure of landfill site.

ANNEX A Republic of Palau

Table of Contents

Republic of Palau

A-1 List of relevant information	1
A-2 Plan of Operation	2
A-3 PDM.....	3

■ List of relevant information

No.	Deliverables/relevant materials	Date	Description
1	National Solid Waste Management Strategy: The Roadmap towards a Clean and Safe Palau 2017 to 2026	Nov. 2017 Approved in Jan. 2018	NSWMS which cover up to 2026 including 5 years action plan.
2	Beverage Container Recycling Regulations	Aug. 2009	Beverage container recycling regulations formulated jointly by MPIIC and MOF.
3	Container Deposit Legislation Act	Oct. 2006	An Act for establishing beverage container deposit fee and creating recycling fund signed by the president of Palau
4	Koror State Budget 2017	Oct. 2017	Koror state budget for FY 2017 received from KSG
5	Tender for Extension of M-Dock Disposal Site	Jun. 2017	Request for proposals for M-Dock landfill third level extension project issued by MPIIC
6	Proposal for Extension of M-Dock Disposal Site	July. 2017	Proposal for extension of M-dock disposal site submitted by FIDC
7	CDL Annual Report Palau		Annual report for CDL which covers from 2011 to 2016 prepared by BPW, MPIIC.
8	CDL Annual Report Palau FY2017	2018	Annual report for CDL which covers from 2011 to 2017 prepared by BPW, MPIIC.
9	Palau Recyclers List	2018	List of recycling company in Palau. There are 6 companies surveyed by Mr. Negoro of PO.
10	The Concept Paper for the Koror State Government “Transportation Station Project”	18 th Mar. 2019	Prepared by the Koror State government.
11	Inter-State Collection System in Babeldaob Island	Apr. 2020	Based on the plan, inter-state collection system was commenced in February 2021.

Pan of Operation

Version 2

Dated 30 Jan 2020

Project Title: Japanese Technical Cooperation Project (II) for Promotion of Regional Initiative on Solid Waste Management in Pacific Island Countries (J-PRISM II)

Activities	Plan	2016				2017				2018				2019				2020				2021				Responsible Organization			
		Actual	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	Japan	GOROP	
Output 1: New NSWMS and its action plan prepared in line with the Cleaner Pacific (2016-2025) are officially submitted																													
1-1 Form a Working Group for the formulation of NSWMS.	Plan																												
	Actual																												
1-2 Review the existing data and conduct supplementary baseline survey to grasp present situation and identify the issues.	Plan																												
	Actual																												
1-3 Develop the draft NSWMS and action plan including 3R activity plan of an outline state.	Plan																												
	Actual																												
1-4 Discuss a necessary institutional, regulatory and financial arrangement to be taken to realize the revised NSWMS.	Plan																												
	Actual																												
1-5 Build a consensus among the stakeholders on the revised NSWMS.	Plan																												
	Actual																												
1-6 Submit NSWMS and its action and implementation plans to the relevant authorities	Plan																												
	Actual																												
1-7 Develop the implementation plan of the revised NSWMS.	Plan																												
	Actual																												
1-8 Hold workshop to disseminate the above.	Plan																												
	Actual																												
Output 2: Good practices of solid waste management /3R are promoted in country and the region.																													
2-1 Compile case studies that other countries can learn from.	Plan																												
	Actual																												
2-2 Send (resource) persons to seminar and training sessions in the region to share the lessons learned.	Plan																												
	Actual																												
2-3 Provide in-country training to visitors and trainees from other island countries.	Plan																												
	Actual																												
2-4 Share experiences of efforts to further enhance 3R activities of Palau	Plan																												
	Actual																												
Output 3: Waste collection is improved in 10 states of Babeldaob Island and in Koror .																													
[10 States in Babeldaob Island]	Plan																												
	Actual																												
3-1 Setup a Working Group headed by BPW-SWM to do 4-3 below.	Plan																												
	Actual																												
3-2 Grasp the current situation of waste collection and identify issues and challenges of the current collection system by WG.	Plan																												
	Actual																												
3-3 Develop Inter-state collection plan (identifying planning specifications, equipment, operational structure, financial planning)	Plan																												
	Actual																												
3-4 Organize a workshop to disseminate the Inter-state collection plan to stakeholders.	Plan																												
	Actual																												
[Koror]	Plan																												
	Actual																												
3-6 Provide support to improve the collection system	Plan																												
	Actual																												
Output 4: Transition from M-dock landfill to new landfill begins.																													
4-1 Setup a Working Group for proper landfill management headed by BPW.	Plan																												
	Actual																												
4-2 To grasp current landfill operation and conduct field investigation at M-Dock Landfill Site	Plan																												
	Actual																												
4-3 Formulate an extension plan for the M-Dock landfill site	Plan																												
	Actual																												
4-4 Extend M-Dock Landfill Site (construction cost comes from Palau side.)	Plan																												
	Actual																												
4-5 Operate M-dock landfill site using the extended platform at M-Dock landfill site	Plan																												
	Actual																												
4-6 Formulate an appropriate closure plan with a periodical monitoring for M-Dock landfill site.	Plan																												
	Actual																												
4-7 Operate a new landfill site with a periodical monitoring in accordance with step-wise landfill operation procedure	Plan																												
	Actual																												
Duration / Phasing																													
	Plan																												
	Actual																												
Monitoring Plan																													
	Plan																												
	Actual																												
Monitoring																													
Joint Coordinating Committee	Plan																												
	Actual																												
Set-up the Detailed Plan of Operation	Plan																												
	Actual																												
Submission of Monitoring Sheet	Plan																												
	Actual																												
Monitoring Mission from Japan	Plan																												
	Actual																												
Joint Monitoring	Plan																												
	Actual																												
Post Monitoring	Plan																												
	Actual																												
Reports/Documents																													
Progress Report	Plan																												
	Actual																												
Project Completion Report	Plan																												
	Actual																												
Public Relations																													
	Plan																												
	Actual																												
	Plan																												
	Actual																												

Project Design Matrix

Project Title: Japanese Technical Cooperation Project for Promotion of Regional Initiative on Solid Waste Management in Pacific Island Countries Phase II (J-PRISM II)

Implementing Agency: Solid Waste Management Division, Bureau of Public Works (BPW-SWM), 10 state governments of Babeldaob
Solid Waste Management Office, Koror State Government (KSG-SWM)

Target Group: Officials of BPW-SWM/ Officials of Koror State Government/ Officials of 10 states in Babeldaob Island/ Officials of an outline state

Version 2

Period of Project: 2017 - 2021 (Five Years)

Dated: Jan 30, 2020

Project Site: Republic of Palau

Model Site: Babeldaob Island, Koror, an outline state

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption
<p>Overall Goal Sustainable management of solid waste in the Pacific region is enhanced based on Pacific Regional Waste and Pollution Management Strategy 2016-2025 (Cleaner Pacific 2025)</p>			
<p>Project Purpose (Region-wise) Human and institutional capacity base for sustainable Solid Waste Management in the Pacific region is strengthened through implementation of Cleaner Pacific 2025. (Country) With a view to commencement of a new landfill site, an appropriate solid waste management system is created.</p>	<p>(Country) 1. Inter-state collection in Babeldaob is carried out. 2. A new landfill site is sustainably operated.</p>	<p>* Contract-out documents of inter-state collection. *Operation records of a new landfill site.</p>	<p>1. Natural disaster would not drastically affect the collaboration among participating countries. 2. Political changes of participating countries would not affect drastically the collaboration among them.</p>
<p>Outputs Output 1: (Region-wise) New NSWMS and its action plan prepared in line with the Cleaner Pacific (2016-2025) are officially submitted to the Minister. Output 2: (Region-wise) Good practices of solid waste management /3R are promoted in country and the region. Output 3: (Country-specific) Waste collection is improved in 10 states of Babeldaob Island and in Koror . Output 4: (Country-specific) Transition from M-dock landfill to a new landfill is appropriately carried out.</p>	<p>1-1 Current SWM situation, issues and measures are elaborated in the NSWMS. 1-2 The NSWMS (final version) is submitted to the Minister ²⁾. 2-1 What is learned from the training organized by J-PRISM (II) Project Office is utilized. 2-2 Palau's experience is presented at regional level meetings. [10 States under purview of BPW-SWM] 3-1 Critical issues of waste collection are identified by the counterpart officials. 3-2 Inter-state collection plan is formulated. 3-3 Officials in charge of SWM in 10 states participate in a workshop to disseminate the 10 state-wide collection plan. 3-4 Collection based on the Inter-state collection plan is initiated. [Koror] 3-5 Provided support/ information is utilized by Koror State Government. 4-1 M-dock is in the process of landfilling in line with a closure plan. 4-2. A new landfill site is operated in accordance with step-wise landfill operation procedure ⁵⁾</p>	<p>*Project documents. *NSWMS *Cover letters of NSWMS which proves that NSWMS is actually submitted to the Minister. *Project documents of J-PRISM (II) Project Office in Samoa *Project documents [10 States under purview of BPW-SWM] *A10 state-wide collection plan *Participants list of a workshop *Records of operation which shows the actual collection starts based on the above plan. [Koror] *Project document *Monitoring reports *Records of operation which shows the actual operation starts in a new landfill site.</p>	<p>3. Counterpart personnel keep working in the field of SWM. 4. Construction of a new landfill site completes as per schedule. 5. Budget for the project activities are allocated and disbursed timely from C/P agencies.</p>

Activities	Inputs		Important Assumption
	The Japanese Side	The Palau Side	
<p><Output 1> 1-1 Form a Working Group for the formulation of NSWMS. 1-2 Review the existing data and conduct supplementary baseline survey to grasp present situation and identify the issues. 1-3 Develop the draft NSWMS and action plan including 3R activity plan of an outline state. 1-4 Discuss a necessary institutional, regulatory and financial arrangement to be taken to realize the NSWMS. 1-5 Build a consensus among the stakeholders on the NSWMS. 1-6 Submit NSWMS and its action and implementation plans to the Minister. 1-7 Develop the implementation plan of the NSWMS. 1-8 Hold a workshop to disseminate the above.</p>	<p>1. Dispatch of experts 2. Local cost for the activities of experts 3. Necessary cost and equipment</p>	<p>1. Allocation of counterpart 2. Office space and facilities for Japanese experts 3. Operational expenses for administrative work, transportation, training, and seminar, etc.</p>	
<p><Output 2> 2-1 Compile case studies that other countries can learn from (e.g. the case of an outline state's endeavor of introducing recycling to an remote island). 2-2 Send (resource) persons to seminar and training sessions in the region to share the lessons learned. 2-3 Provide in-country training to visitors and trainees from other island countries. 2-4 Share experiences of efforts to further enhance 3R activities of Palau</p>			<p style="text-align: center;">Pre-Conditions</p> <p>Cooperation of community people of the target areas are obtained.</p>
			<Issues and countermeasures>

<p><Output 3> <u>[10 States under purview of BPW-SWM]</u> 3-1 Setup a Working Group headed by BPW-SWM to do below. 3-2 Grasp the current situation of waste collection (i.e. coverage, collection frequency and timing, collected amount, etc.) by WG and identify issues and challenges of the current collection system by WG 3-3 Develop Inter-state collection plan (identifying planning specifications, equipment, operational structure, financial planning) 3-4 Organize a workshop to disseminate the Inter-state collection plan to stakeholders.</p> <p><u>[Koror]</u> 3-6 Provide support to improve the collection system (tentatively (i) feasibility of introduction of transfer station, and (ii) waste separation at designated location.)</p> <p><Output 4> 4-1 Setup a Working Group for proper landfill management headed by BPW. 4-2 Grasp current landfill operation and conduct field investigation at M-Dock landfill site 4-3 Formulate an extension plan for the M-Dock landfill site 4-4 Extend M-Dock Landfill Site (construction cost comes from Palau side.) 4-5 Operate M-dock landfill site using the extended platform at M-Dock landfill site 4-6 Formulate an appropriate closure plan with a periodical monitoring for M-Dock landfill site. 4-7 Operate a new landfill site with a periodical monitoring in accordance with step-wise landfill operation procedure ⁵⁾</p>			
--	--	--	--

Note

- 1) Ten states in Babeldaob are Airai, Ngchesar, Melekeok, Ngiwal, Ngaraard, Ngerchelung, Ngardmau, Ngaremelegui, Ngatpang and Aimelik.
- 2) In Palau, NSWMS was called National Solid Waste Management Plan (NSWMP). The old NSWMP was approved by the Minister in April 2012.
- 3) An outline state (a remote island accessible via sea) will be decided based on discussion among stakeholders once the project starts.
- 4) Target quantities of indicators for Output 2 will be set only after the related region-wide activities are decided by J-PRISM (II) Project Office in Samoa.
- 5) Step-wise landfill operation procedure is prepared by the "Preparatory Survey on the Project for the Construction of Palau New National Landfill" (Draft Final Report Jan. 2018)

*ANNEX B The Federal States of
Micronesia*

Table of Contents

The Federal States of Micronesia

B-1 List of relevant information.....	1
B-2 Plan of Operation	4
FSM National.....	4
Yap	5
Chuuk	6
Pohnpei	7
Kosrae	8
B-3 PDM.....	9
FSM National.....	9
Yap	10
Chuuk	11
Pohnpei	12
Kosrae	13

■ List of relevant information

No.	Deliverables/relevant materials	Date	Description
1	Yap State Solid Waste Management Strategy (2018-2027)	2017	Yap State Solid Waste Management Strategy (2018-2027) was formulated as a long-term plan based on the waste flow and so on. The Action plan included activities, systems, schedules and costs for first 5 years was formulated, which attached an annual plan (Annual Work Program).
2	Kosrae State Solid Waste Management Strategy (2018-2027)	2018	Kosrae State Solid Waste Management Strategy (2018-2027) was formulated as a long-term plan based on the waste flow and so on. The Action plan included activities, systems, schedules and costs for first 5 years was formulated, which attached an annual plan (Annual Work Program).
3	Chuuk State Solid Waste Management Strategy (2018-2027)	2018	Chuuk State Solid Waste Management Strategy (2018-2027) was formulated as a long-term plan based on the waste flow and so on. The Action plan included activities, systems, schedules and costs for first 5 years was formulated, which attached an annual plan (Annual Work Program).
4	Pohnpei State Solid Waste Management Strategy (2020-2029)	2019	Pohnpei State Solid Waste Management Strategy (2020-2029) was formulated as a long-term plan based on the waste flow and so on. The Action plan included activities, systems, schedules and costs for first 5 years was formulated, which attached an annual plan (Annual Work Program).

5	Kosrae State Solid Waste Landfill Layout Plan	2017	Layout of Tofol landfill site
6	Contract Document on Refuse collection service in Yap State	2017	Contract document on public collection service in Colonia (FY 2018)
7	Growing Vegetables for Typhoon Food Recovery in Yap State	?	Methodology of making compost which is recommended by Division of Forestry is included in this document.
8	A Preliminary Survey on Container Deposit Legislation for Pohnpei and Chuuk States of the FSM and the Republic of the Marshall Islands	2017	Mr. Alice Leney compiled reports of preliminary surveys on CDL for Pohnpei and Chuuk States of the FSM and the Republic of the Marshall Islands.
9	Assessment of the Kosrae Container Deposit Legislation and Recycling System Operation	2017	Mr. Alice Leney compiled reports on the current situation and issues of CDL in Kosrae.
10	Survey on community dump sites	2017	JPRISM experts conducted surveys on community dump sites with EPA and DPWT and compiled as a report.
11	Current waste flow in Yap	2017	How to make a waste flow of Yap based on the baseline survey was compiled as a report and attached to the SSWMS of Yap.
12	Current waste flow in Kosrae	2018	How to make a waste flow of Kosrae based on the baseline survey was compiled as a report and attached to the SSWMS of Kosrae.
13	Current waste flow in Chuuk	2018	How to make a waste flow of Chuuk based on the baseline survey was compiled as a report and attached to the SSWMS of Chuuk
14	Proposed recycling Area	2019	Map for land use plan in public landfill site for construction of recycling center building in Pohnpei State of FSM.
15	Contract document for waste collection service in	2019	Contract document between DPWT and private company for collection of

	Kolonia Town Government		wastes in Kolonia Town in Yap State of FSM.
16	Kosrae State Plastic bag Law(SL 11-174)	2019	Law for ban on single use plastic bags in Kosrae State of FSM.
17	Yap Collection expansion Pilot Project	2020	Pilot Project report on waste collection expansion in Yap State
18	Planning and Implementation of Inter Municipal Collection System in Kosrae	2020	Planning and Implementation report on IMCS in Kosrae State
19	Memorandum of Understanding for IMCS in Kosrae	2019	Memorandum of Understanding for IMCS between DTI and 4 Municipalities.
20	Kosrae DTI Code Amendment	2019	Amendment of code of practice fir DTI to introduce IMCS in Kosrae.
21	Contribution of 2,000USD for IMCS by Lelu Town Government	2020	Approval letter on contribution of 2,000 USD by Lelu TG to Cenntal Government.
22	Planning and Implementation of Inter Municipal Collection System in Kosrae	2020	Inter municipal collection plan and implementation report in Kosrae
23	Material for virtual training on proper maintenance of garbage collection vehicle and heavy machinery	2021	A set of materials used in the online training on proper daily maintenance of waste collection vehicle and heavy machinery in Kosrae

Project Title: Japanese Technical Cooperation for Promotion of Regional Initiative on Solid Waste Management in Pacific Island Countries Phase II (J-PRISM II)

Activities Sub-Activities	Plan	2016				2017				2018				2019				2020				2021				
	Actual	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	
Output 1: Support from OEMM to formulate SSWMS is provided to each state.																										
1-1 Obtain support from SPREP to formulate new SSWMS on behalf of each state.	Plan																									
	Actual																									
1-2 Organize a workshop in order to support state initiatives to formulate SSWMSs in collaboration with SPREP.	Plan																									
	Actual																									
Output 2: Good practices of solid waste management /3R are promoted in country.																										
2-1 Compile case studies that each state of FSM produced under the J-PRISM(II).	Plan																									
	Actual																									
2-2 Organize workshops for officials of KIRMA/EPAs, Public Works and other relevant organizations to share knowledge	Plan																									
	Actual																									
Duration / Phasing	Plan																									
	Actual																									
Monitoring Plan	Plan																									
	Actual																									
Monitoring																										
Joint Coordinating Committee	Plan																									
	Actual																									
Set-up the Detailed Plan of Operation	Plan																									
	Actual																									
Submission of Monitoring Sheet	Plan																									
	Actual																									
Monitoring Mission from Japan	Plan																									
	Actual																									
Joint Monitoring	Plan																									
	Actual																									
Post Monitoring	Plan																									
	Actual																									
Reports/Documents																										
	Plan																									
	Actual																									
Project Completion Report	Plan																									
	Actual																									
Public Relations																										
	Plan																									
	Actual																									
	Plan																									
	Actual																									

Plan of Operation

Version 1 FSM(Yap)

Dated 28 Sep 2017

Project Title: Japanese Technical Cooperation for Promotion of Regional Initiative on Solid Waste Management in Pacific Island Countries Phase II (J-PRISM II)

Activities Sub-Activities	Plan	2016				2017				2018				2019				2020				2021						
	Actual	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV			
Output 1: New SSWMS and its action plan prepared in line with the Cleaner Pacific (2016-2025) are developed.																												
1-1 To form a Working Group for the formulation of SSWMS.	Plan																											
	Actual																											
1-2 Review the existing data and conduct supplementary baseline survey to grasp present situation and identify the issues.	Plan																											
	Actual																											
1-3 Develop the draft SSWMS and action plan.	Plan																											
	Actual																											
1-4 Discuss a necessary institutional, regulatory and financial arrangement to be taken to realize the revised SSWMS.	Plan																											
	Actual																											
1-5 Build a consensus among the stakeholders on the revised SSWMS.	Plan																											
	Actual																											
1-6 Finalize SSWMS and its action.	Plan																											
	Actual																											
1-7 Develop the implementation plan of the revised SSWMS.	Plan																											
	Actual																											
1-8 Hold and participate workshop to disseminate the above and obtain feedback on it.	Plan																											
	Actual																											
Output 2: Good practices of solid waste management /3R are promoted in country and the region.																												
2-1 Compile case studies that other states of FSM as well as other PICs can learn from.	Plan																											
	Actual																											
2-2 Send (resource) persons to seminar and training sessions in other states of FSM as well as in PICs to share the lessons learned.	Plan																											
	Actual																											
2-3 Provide in-country training to visitors and trainees from other states of FSM as well as other PICs.	Plan																											
	Actual																											
Output 3: Waste collection is improved in Yap island.																												
3-1 Identify issues and challenges of current waste collection in order to extract factors and conditions to formulate pilot projects.	Plan																											
	Actual																											
3-2 Choose pilot sites (communities)	Plan																											
	Actual																											
3-3 Formulate plans for pilot project for each selected communities.	Plan																											
	Actual																											
3-4 Implement a pilot project	Plan																											
	Actual																											
3-5 Examine the result of pilot activities and verify their applicability to other communities.	Plan																											
	Actual																											
3-6 Incorporate the findings into the future collection plan, which is included in SSWMS.	Plan																											
	Actual																											
Duration / Phasing																												
	Plan																											
	Actual																											
Monitoring Plan																												
	Plan																											
	Actual																											
Monitoring																												
Joint Coordinating Committee	Plan																											
	Actual																											
Set-up the Detailed Plan of Operation	Plan																											
	Actual																											
Submission of Monitoring Sheet	Plan																											
	Actual																											
Monitoring Mission from Japan	Plan																											
	Actual																											
Joint Monitoring	Plan																											
	Actual																											
Post Monitoring	Plan																											
	Actual																											
Reports/Documents																												
	Plan																											
	Actual																											
Project Completion Report	Plan																											
	Actual																											
Public Relations																												
	Plan																											
	Actual																											
	Plan																											
	Actual																											

Plan of Operation

Version 1 FSM(Chuuk)

Dated 28 Sep 2017

Project Title: Japanese Technical Cooperation for Promotion of Regional Initiative on Solid Waste Management in Pacific Island Countries Phase II (J-PRISM II)

Activities Sub-Activities	Plan Actual	2016				2017				2018				2019				2020				2021					
		I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV		
Output 1: New SSWMS and its action plan prepared in line with the Cleaner Pacific (2016-2025) are developed.																											
1-1 To form a Working Group for the formulation of SSWMS.	Plan																										
	Actual																										
1-2 Review the existing data and conduct supplementary baseline survey to grasp present situation and identify the issues.	Plan																										
	Actual																										
1-3 Develop the draft SSWMS and action plan.	Plan																										
	Actual																										
1-4 Discuss a necessary institutional, regulatory and financial arrangement to be taken to realize the revised SSWMS.	Plan																										
	Actual																										
1-5 Build a consensus among the stakeholders on the revised SSWMS.	Plan																										
	Actual																										
1-6 Finalize SSWMS and its action plan.	Plan																										
	Actual																										
1-7 Develop the implementation plan of the revised SSWMS.	Plan																										
	Actual																										
1-8 Hold and participate workshop to disseminate the above and obtain feedback on it.	Plan																										
	Actual																										
Output 2: Good practices of solid waste management /3R are promoted in country and the region.																											
2-1 Compile case studies that other states of FSM as well as other PICs can learn from.	Plan																										
	Actual																										
2-2 Send (resource) persons to seminar and training sessions in other states of FSM as well as in PICs to share the lessons learned.	Plan																										
	Actual																										
2-3 Provide in-country training to visitors and trainees from other states of FSM as well as other PICs.	Plan																										
	Actual																										
Output 3: Effective CDL implementation mechanism is explored by relevant authorities.																											
3-1 Conduct preliminary survey to grasp the current situation.	Plan																										
	Actual																										
3-2 Study technical requirements to draft a CDL law and associated regulations.	Plan																										
	Actual																										
3-3 Explore appropriate monitoring and contractual arrangement between EPA and the System Operator which are essential to start-up CDL.	Plan																										
	Actual																										
3-4 Estimate budget to capitalize the Recycling Fund to cover the excess cans and bottles that will come in to the system in the first year.	Plan																										
	Actual																										
3-5 Develop investment plan to set up a Material Recovery Facility.	Plan																										
	Actual																										
3-6 Explore practical mechanism to the relevant organizations such as measurement, accounting and data collection, etc.	Plan																										
	Actual																										
Duration / Phasing																											
	Plan																										
	Actual																										
Monitoring Plan																											
	Plan																										
	Actual																										
Monitoring																											
Joint Coordinating Committee	Plan																										
	Actual																										
Set-up the Detailed Plan of Operation	Plan																										
	Actual																										
Submission of Monitoring Sheet	Plan																										
	Actual																										
Monitoring Mission from Japan	Plan																										
	Actual																										
Joint Monitoring	Plan																										
	Actual																										
Post Monitoring	Plan																										
	Actual																										
Reports/Documents																											
Progress Report	Plan																										
	Actual																										
Project Completion Report	Plan																										
	Actual																										
Public Relations																											
	Plan																										
	Actual																										
	Plan																										
	Actual																										

Plan of Operation

Version 1 FSM(Pohnpei)

Dated 28 Sep 2017

Project Title: Japanese Technical Cooperation for Promotion of Regional Initiative on Solid Waste Management in Pacific Island Countries Phase II (J-PRISM II)

Activities Sub-Activities	Plan	2016				2017				2018				2019				2020				2021				
	Actual	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	
Output 1: New SSWMS and its action plan prepared in line with the Cleaner Pacific (2016-2025) are developed.																										
1-1 To form a Working Group for the formulation of SSWMS.	Plan																									
	Actual																									
1-2 Review the existing data and conduct supplementary baseline survey to grasp present situation and identify the issues.	Plan																									
	Actual																									
1-3 Develop the draft SSWMS and action plan.	Plan																									
	Actual																									
1-4 Discuss a necessary institutional, regulatory and financial arrangement to be taken to realize the revised SSWMS.	Plan																									
	Actual																									
1-5 Build a consensus among the stakeholders on the revised SSWMS.	Plan																									
	Actual																									
1-6 Finalize SSWMS and its action plan.	Plan																									
	Actual																									
1-7 Develop the implementation plan of the revised SSWMS.	Plan																									
	Actual																									
1-8 Hold and participate workshop to disseminate the above and obtain feedback on it.	Plan																									
	Actual																									
Output 2: Good practices of solid waste management /3R are promoted in country and the region.																										
2-1 Compile case studies that other states of FSM as well as other PICs can learn from.	Plan																									
	Actual																									
2-2 Send (resource) persons to seminar and training sessions in other states of FSM as well as in PICs to share the lessons learned.	Plan																									
	Actual																									
2-3 Provide in-country training to visitors and trainees from other states of FSM as well as other PICs.	Plan																									
	Actual																									
Output 3: Effective CDL implementation mechanism is explored by relevant authorities.																										
3-1 Conduct preliminary survey to grasp the current situation.	Plan																									
	Actual																									
3-2 Implement a technical study for institutional rearrangement (e.g. EPA from an operator to a regulator, KTG and MMG withdraw from the operation, etc.) along with amendment of the current law and associated regulations.	Plan																									
	Actual																									
3-3 Develop technical systems to set up monitoring and contractual arrangement between EPA and the System Operator which are essential to start-up CDL.	Plan																									
	Actual																									
3-4 Develop practical methods for the System Operator such as measurement, accounting and data collection, etc.	Plan																									
	Actual																									
Duration / Phasing	Plan																									
	Actual																									
Monitoring Plan	Plan																									
	Actual																									
Monitoring																										
Joint Coordinating Committee	Plan																									
	Actual																									
Set-up the Detailed Plan of Operation	Plan																									
	Actual																									
Submission of Monitoring Sheet	Plan																									
	Actual																									
Monitoring Mission from Japan	Plan																									
	Actual																									
Joint Monitoring	Plan																									
	Actual																									
Post Monitoring	Plan																									
	Actual																									
Reports/Documents																										
Progress Report	Plan																									
	Actual																									
Project Completion Report	Plan																									
	Actual																									
Public Relations																										
	Plan																									
	Actual																									
	Plan																									
	Actual																									

Plan of Operation

Version 3 FSM(Kosrae)

Dated 26 Sept. 2019

Project Title: Japanese Technical Cooperation for Promotion of Regional Initiative on Solid Waste Management in Pacific Island Countries Phase II (J-PRISM II)

Activities Sub-Activities	Plan	2016				2017				2018				2019				2020				2021				
	Actual	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	
Output 1: New SSWMS and its action plan prepared in line with the Cleaner Pacific (2016-2025) are developed.																										
1-1 To form a Working Group for the formulation of SSWMS.	Plan																									
	Actual																									
1-2 Review the existing data and conduct supplementary baseline survey to grasp present situation and identify the issues.	Plan																									
	Actual																									
1-3 Develop the draft SSWMS and action plan.	Plan																									
	Actual																									
1-4 Discuss a necessary institutional, regulatory and financial arrangement to be taken to realize the revised SSWMS.	Plan																									
	Actual																									
1-5 Build a consensus among the stakeholders on the revised SSWMS.	Plan																									
	Actual																									
1-6 Finalize SSWMS and its action plan.	Plan																									
	Actual																									
1-7 Develop the implementation plan of the revised SSWMS.	Plan																									
	Actual																									
1-8 Hold and participate workshop to disseminate the above and obtain feedback on it.	Plan																									
	Actual																									
Output 2: Good practices of solid waste management /3R are promoted in country and the region.																										
2-1 Compile case studies that other states of FSM as well as other PICs can learn from	Plan																									
	Actual																									
2-2 Send (resource) persons to seminar and training sessions in other states of FSM as well as in PICs to share the lessons learned.	Plan																									
	Actual																									
2-3 Provide in-country training to visitors and trainees from other states of FSM as well as other PICs.	Plan																									
	Actual																									
Output 3: Waste collection is improved in Kosrae.																										
3-1 Re-formulate a working group (WG) to formulate waste collection plans	Plan																									
	Actual																									
3-2 Identify issues and challenges of current waste collection in order to extract factors and conditions to formulate waste collection plans.	Plan																									
	Actual																									
3-3 Formulate waste collection plans.	Plan																									
	Actual																									
Duration / Phasing	Plan																									
	Actual																									
Monitoring Plan	Plan																									
	Actual																									
Monitoring																										
Joint Coordinating Committee	Plan																									
	Actual																									
Set-up the Detailed Plan of Operation	Plan																									
	Actual																									
Submission of Monitoring Sheet	Plan																									
	Actual																									
Monitoring Mission from Japan	Plan																									
	Actual																									
Joint Monitoring	Plan																									
	Actual																									
Post Monitoring	Plan																									
	Actual																									
Reports/Documents																										
Progress Report	Plan																									
	Actual																									
Project Completion Report	Plan																									
	Actual																									
Public Relations																										
	Plan																									
	Actual																									
	Plan																									
	Actual																									

Project Design Matrix

Project Title: Japanese Technical Cooperation for Promotion of Regional Initiative on Solid Waste Management in Pacific Island Countries Phase II (J-PRISM II)

Implementing Agency: Office of Environment and Emergency Management (OEEM)

Target Group: Officials of OEEM, EPAs and Public Works in four states

Period of Project: 2017 - 2021 (Five Years)

Version 1

Dated: 28 Sep 2017

Project Site: FSM

Model Site:

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption
Overall Goal Sustainable management of solid waste in the Pacific region is enhanced based on Pacific Regional Waste and Pollution Management Strategy 2016-2025 (Cleaner Pacific 2025)			
Project Purpose (Region-wise) Human and institutional capacity base for sustainable Solid Waste Management in the Pacific region is strengthened through implementation of Cleaner Pacific 2025. (Country) Support to creation of solid waste management system in each four state is provided.	1. Supports provided to each states (i.e. workshops and trainings, etc.)	* Project documents	1. Natural disaster would not drastically affect the collaboration among participating countries. 2. Political changes of participating countries would not affect drastically the collaboration among them.
Outputs Output 1: Support from OEEM to formulate SSWMS is provided to each state.	1-1 Core concept of CP2025 are incorporated into SSWMSs.	*Project documents compiled by OEEM. *List of participants in the workshop.	3. Counterpart personnel keep working in the field of SWM. 4. Budget for the project activities are allocated and disbursed timely from C/P agencies.
Output 2: Good practices of solid waste management /3R are promoted in country.	2-1 Compiled case studies are shared with other countries through OEEM 2-2 Three times of workshops are provided to share knowledge and experiences among four states.	*Project documents of J-PRISM (II) Project Office in Samoa *Project documents compiled by OEEM.	

Activities	Inputs		Important Assumption
	The Japanese Side	The FSM Side	
<Output 1> 1-1 Obtain support from SPREP to formulate new SSWMS on behalf of each state. 1-2 Organize a workshop in order to support state initiatives to formulate SSWMSs in collaboration with SPREP.	1. Dispatch of experts 2. Training 3. Local cost for the activities of experts 4. Necessary cost and equipment	1. Allocation of counterpart 2. Office space and facilities for Japanese experts 3. Operational expenses for administrative work, transportation, training, and seminar, etc.	
<Output 2> 2-1 Compile case studies that each state of FSM produced under the J-PRISM(II). 2-2 Organize workshops for officials of KIRMA/EPAs, Public Works and other relevant organizations to share knowledge and experiences among states.			(Pre-conditions) Cooperation of community people of the target areas are obtained.
			<Issues and countermeasures>

Note

1) Target quantities of indicators for Output 2 will be set only after the related region-wide activities are decided by OEEM as well as J-PRISM (II) Project Office in Samoa.

Project Design Matrix

Project Title: Japanese Technical Cooperation for Promotion of Regional Initiative on Solid Waste Management in Pacific Island Countries Phase II (J-PRISM II)

Implementing Agency: Dept. of Public Works and Transportation (DPWT); Environmental Protection Agency (EPA)

Target Group: Officials of DPWT; officials of EPA; people in the pilot activities' area

Period of Project: 2017 - 2021 (Five Years)

Project Site: Yap Island

Version 2

Dated: 26 Sep 2019

Model Site:

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption
<p>Overall Goal Sustainable management of solid waste in the Pacific region is enhanced based on Pacific Regional Waste and Pollution Management Strategy 2016-2025 (Cleaner Pacific 2025)</p>			
<p>Project Purpose (Region-wise) Human and institutional capacity base for sustainable Solid Waste Management in the Pacific region is strengthened through implementation of Cleaner Pacific 2025. (State) Creation of solid waste management system is promoted.</p>	<p>1. Current SWM situation is technically as well as quantitatively analyzed and understood. 2. SWM challenges are identified. 3. Measures to tackle identified SWM challenges are proposed.</p>	<p>•Meeting minutes of the Working Group. •Contents of SSWMS</p>	<p>1. Natural disaster would not drastically affect the collaboration among participating countries. 2. Political changes of participating countries would not affect drastically the collaboration among them.</p>
<p>Outputs Output 1: (Region-wise) New SSWMS and its action plan prepared in line with the Cleaner Pacific (2016-2025) are developed. Output 2: (Region-wise) Good practices of solid waste management /3R are promoted in country and the region. Output 3: (State-specific) Waste collection is improved in Yap Island.</p>	<p>1-1 The SSWMS (final version) is submitted to the relevant authority²⁾. 2-1 What is learned from the training organized by J-PRISM (II) Project Office is utilized. 3-1 Collection rate is improved in the pilot project area.</p>	<p>•Meeting minutes of the Working Group. •SSWMS •Cover letters of SSWMS which proves that SSWMS is actually submitted to the relevant authorities. •Project documents of J-PRISM (II) Project Office in Samoa •Project documents compiled by OEEM. •Report of a pilot project. •A collection improvement plan.</p>	<p>3. Counterpart personnel keep working in the field of SWM. 4. Budget for the project activities are allocated and disbursed timely from C/P agencies.</p>
Activities	Inputs		Important Assumption
	The Japanese Side	The Yap Side	
<p><Output 1> 1-1 To form a Working Group for the formulation of SSWMS. 1-2 Review the existing data and conduct supplementary baseline survey to grasp present situation and identify the issues. 1-3 Develop the draft SSWMS and action plan. 1-4 Discuss a necessary institutional, regulatory and financial arrangement to be taken to realize the revised SSWMS. 1-5 Build a consensus among the stakeholders on the revised SSWMS. 1-6 Finalize SSWMS and its action plan 1-7 Develop a implementation plan of the revised SSWMS. 1-8 Hold and participate workshop to disseminate the above and obtain feedback on it. <Output 2> 2-1 Compile case studies that other states of FSM as well as other PICs can learn from. 2-2 Send (resource) persons to seminar and training sessions in other states of FSM as well as in other pacific island countries(PICs) to share the lessons learned. 2-3 Provide in-country training to visitors and trainees from other states of FSM as well as other PICs . <Output 3> 3-1 Identify issues and challenges of current waste collection in order to extract factors and conditions to formulate pilot projects. 3-2 Choose pilot sites (communities) 3-3 Formulate plans for pilot project for each selected communities. 3-4 Implement a pilot project. 3-5 Examine the result of pilot activities and verify their applicability to other communities. 3-6 Incorporate the findings into the future collection plan, which is included in SSWMS.</p>	<p>1. Dispatch of experts 2. Training 3. Local cost for the activities of experts 4. Necessary cost and equipment</p>	<p>1. Allocation of counterpart 2. Office space and facilities for Japanese experts 3. Operational expenses for administrative work, transportation, training, and seminar, etc.</p>	<p>Cooperation of community people of the target areas are obtained.</p> <p style="text-align: center;">▶</p> <p><Issues and countermeasures></p>

Note

1) OEEM stands for Office of Environment and Emergency Management.

2) Output1 is considered as produced by achieving the indicator 1-1.

3) Target quantities of indicators for Output 2 will be set only after the related region-wide activities are decided by OEEM as well as J-PRISM (II) Project Office in Samoa.

Project Design Matrix

Project Title: Japanese Technical Cooperation for Promotion of Regional Initiative on Solid Waste Management in Pacific Island Countries Phase II (J-PRISM II)

Implementing Agency: Dept. of Transportation and Public Works (DTPW); Environmental Protection Agency (EPA)

Target Group: Officials of DTPW; officials of EPA

Period of Project: 2017 - 2021 (Five Years)

Project Site: Chuuk (Ueno)

Version 1

Dated: 28 Sep 2017

Narrative Summary		Model Site:	
Overall Goal	Objectively Verifiable Indicators	Means of Verification	Important Assumption
Sustainable management of solid waste in the Pacific region is enhanced based on Pacific Regional Waste and Pollution Management Strategy 2016-2025 (Cleaner Pacific 2025)			
Project Purpose			
(Region-wise) Human and institutional capacity base for sustainable Solid Waste Management in the Pacific region is strengthened through implementation of Cleaner Pacific 2025.			
(State) Creation of solid waste management system is promoted.			
Outputs			
Output 1: New SSWMS and its action plan prepared in line with the Cleaner Pacific (2016-2025) are developed.			
Output 2: Good practices of solid waste management /3R are promoted in the country and the region.			
Output 3: Effective CDL implementation mechanism is explored by relevant authorities.			
1-1 The SSWMS (final version) is submitted to the relevant authority ²⁾ .		<ul style="list-style-type: none"> • Meeting minutes of the Working Group. • Contents of SSWMS 	
2-1 What is learned from the training organized by J-PRISM (II) Project Office is utilized.		<ul style="list-style-type: none"> • Project documents of J-PRISM (II) Project Office in Samoa • Project documents compiled by OEEM. 	
3-1 Guideline on implementation procedure such as measurement, accounting and data collection is prepared.		<ul style="list-style-type: none"> • Project documents (draft laws and regulations, guideline) 	
3. Counterpart personnel keep working in the field of SWM.		4. Budget for the project activities are allocated and disbursed timely from C/P agencies.	
(for CDL activities)		5. Enabling political environment for CDL is essential to take up this new Output3.	
6. Before the actual implementation of CDL, a necessary budget for the Recycling Fund shall be allocated.		7. Before the actual implementation of CDL, Material Recovery Facility and Bailing Equipment shall be properly set up.	
Activities	Inputs		Important Assumption
<p><Output 1> 1-1 To form a Working Group for the formulation of SSWMS. 1-2 Review the existing data and conduct supplementary baseline survey to grasp present situation and identify the issues. 1-3 Develop the draft SSWMS and action plan. 1-4 Discuss a necessary institutional, regulatory and financial arrangement to be taken to realize the revised SSWMS. 1-5 Build a consensus among the stakeholders on the revised SSWMS. 1-6 Finalize SSWMS and its action plan. 1-7 Develop an implementation plan of the revised SSWMS. 1-8 Hold and participate workshop to disseminate the above and obtain feedback on it.</p> <p><Output 2> 2-1 Compile case studies that other states of FSM as well as other PICs can learn from. 2-2 Send (resource) persons to seminar and training sessions in other states of FSM as well as in PICs to share the lessons learned. 2-3 Provide in-country training to visitors and trainees from other states of FSM as well as other PICs.</p> <p><Output 3> 3-1 Conduct preliminary survey to grasp the current situation. 3-2 Study technical requirements to draft a CDL law and associated regulations. 3-3 Explore appropriate monitoring and contractual arrangement between EPA and the System Operator which are essential to start-up CDL. 3-4 Estimate budget to capitalize the Recycling Fund to cover the excess cans and bottles that will come in to the system in the first year. 3-5 Develop investment plan to set up a Material Recovery Facility. 3-6 Explore practical mechanism to the relevant organizations such as measurement, accounting and data collection, etc.</p>	The Japanese Side	The Chuuk Side	<p>Preconditions</p> <p style="text-align: center;">↓</p> <p style="text-align: center;"><Issues and countermeasures></p>
	<p>1. Dispatch of experts</p> <p>2. Training</p> <p>3. Local cost for the activities of experts</p> <p>4. Necessary cost and equipment</p>	<p>1. Allocation of counterpart</p> <p>2. Office space and facilities for Japanese experts</p> <p>3. Operational expenses for administrative work, transportation, training, and seminar, etc.</p>	

Note

1) OEEM stands for Office of Environment and Emergency Management.

2) Output1 is considered as produced by achieving the indicator 1-1.

3) Target quantities of indicators for Output 3 will be set only after the related region-wide activities are decided by OEEM as well as J-PRISM (II) Project Office in Samoa.

Project Design Matrix

Project Title: Japanese Technical Cooperation for Promotion of Regional Initiative on Solid Waste Management in Pacific Island Countries Phase II (J-PRISM II)

Implementing Agency: Pohnpei Environmental Protection Agency (EPA), Office of Transportation and Infrastructure (T&I)

Target Group: Officials of EPA, T&I and other concerned organizations

Period of Project: 2017 - 2021 (Five Years)

Version 1

Dated: 28 Sep 2017

Project Site: Pohnpei

Model Site:

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption	
Overall Goal Sustainable management of solid waste in the Pacific region is enhanced based on Pacific Regional Waste and Pollution Management Strategy 2016-2025 (Cleaner Pacific 2025)				
Project Purpose (Region-wise) Human and institutional capacity base for sustainable Solid Waste Management in the Pacific region is strengthened through implementation of Cleaner Pacific 2025. (State) Creation of solid waste management system is promoted.	1. Current SWM situation is technically as well as quantitatively analyzed and understood. 2. SWM challenges are identified. 3. Measures to tackle identified SWM challenges are proposed.	• Meeting minutes of the Working Group. • Contents of SSWMS	1. Natural disaster would not drastically affect the collaboration among participating countries. 2. Political changes of participating countries would not affect drastically the collaboration among them.	
Outputs Output 1: New SSWMS and its action plan prepared in line with the Cleaner Pacific (2016-2025) are developed. Output 2: Good practices of solid waste management /3R are promoted in the country and the region. Output 3: Effective CDL implementation mechanism is explored by relevant authorities.	1-1 The SSWMS (final version) is submitted to the relevant authority ²⁾ . 2-1 What is learned from the training organized by J-PRISM (II) Project Office is utilized. 3-1 Guideline on implementation procedure such as measurement, accounting and data collection is prepared.	• Meeting minutes of the Working Group. • SSWMS • Cover letters of SSWMS which proves that SSWMS is actually submitted to the relevant authorities. • Project documents of J-PRISM (II) Project Office in Samoa • Project documents compiled by OEEM. • Project documents (draft laws and regulations, guideline)	3. Counterpart personnel keep working in the field of SWM. 4. Budget for the project activities are allocated and disbursed timely from C/P agencies. (for CDL activities) 5. Enabling political environment for CDL is essential to take up this new Output3.	
Activities	Inputs		Important Assumption	
<Output 1> 1-1 To form a Working Group for the formulation of SSWMS. (WG will include municipalities in Pohnpei.) 1-2 Review the existing data and conduct supplementary baseline survey to grasp present situation and identify the issues. 1-3 Develop the draft SSWMS and action plan. 1-4 Discuss a necessary institutional, regulatory and financial arrangement to be taken to realize the revised SSWMS. 1-5 Build a consensus among the stakeholders on the revised SSWMS. 1-6 Finalize SSWMS and its action plan. 1-7 Develop an implementation plan of the revised SSWMS. 1-8 Hold and participate workshop to disseminate the above and obtain feedback on it. <Output 2> 2-1 Compile case studies that other states of FSM as well as other PICs can learn. 2-2 Send (resource) persons to seminar and training sessions in other states of FSM as well as in other Pacific island countries(PICs) to share the lessons learned. 2-3 Provide in-country training to visitors and trainees from other states of FSM as well as other PICs. <Output 3> 3-1 Conduct preliminary survey to grasp the current situation. 3-2 Implement a technical study for institutional rearrangement (e.g. EPA from an operator to a regulator, KTG and MMG withdraw from the operation, etc.) along with amendment of the current law and associated regulations. 3-3 Develop technical systems to set up monitoring and contractual arrangement between EPA and the System Operator which are essential to start-up CDL. 3-4 Develop practical methods for the System Operator such as measurement, accounting and data collection, etc.	The Japanese Side 1. Dispatch of experts 2. Training 3. Local cost for the activities of experts 4. Necessary cost and equipment	The Pohnpei Side 1. Allocation of counterpart 2. Office space and facilities for Japanese experts 3. Operational expenses for administrative work, transportation, training, and seminar, etc.		
	(Pre-conditions)			
				<Issues and countermeasures>

Note

1) OEEM : Office of Environment and Emergency Management.

KTG : Kolonia Town Government MMG: Madolenihmw Municipal Government

2) Output1 is considered as produced by achieving the indicator 1-1.

3) Target quantities of indicators for Output 2 will be set only after the related region-wide activities are decided by OEEM as well as J-PRISM (II) Project Office in Samoa.

Project Design Matrix

Project Title: Japanese Technical Cooperation for Promotion of Regional Initiative on Solid Waste Management in Pacific Island Countries Phase II (J-PRISM II)

Implementing Agency: Kosrae Island Resource Management Authority (KIRMA), Dept. of Transportation and Infrastructure (DT&I)

Target Group: Officials of KIRMA and DT&I



Period of Project: 2017 - 2021 (Five Years)

Project Site: Kosrae

Model Site:

Version 2

Dated: 26 Sep 2019

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption
Overall Goal Sustainable management of solid waste in the Pacific region is enhanced based on Pacific Regional Waste and Pollution Management Strategy 2016-2025 (Cleaner Pacific 2025)			
Project Purpose (Region-wise) Human and institutional capacity base for sustainable Solid Waste Management in the Pacific region is strengthened through implementation of Cleaner Pacific 2025. (State) Creation of solid waste management system is promoted.	1. Current SWM situation is technically as well as quantitatively analyzed and understood. 2. SWM challenges are identified. 3. Measures to tackle identified SWM challenges are proposed.	• Meeting minutes of the Working Group. • Contents of SSWMS	1. Natural disaster would not drastically affect the collaboration among participating countries. 2. Political changes of participating countries would not affect drastically the collaboration among them.
Outputs Output 1: New SSWMS and its action plan prepared in line with the Cleaner Pacific (2016-2025) are developed. Output 2: Good practices of solid waste management /3R are promoted in the country and the region. Output 3: Waste collection is improved in Kosrae	1-1 The SSWMS (final version) is submitted to the relevant authority ¹⁾ . 2-1 What is learned from the training organized by J-PRISM (II) Project Office is utilized. 3-1 Collection rate is improved in Kosrae.	• Project documents • Meeting minutes of the Working Group. • SSWMS • Cover letters of SSWMS which proves that SSWMS is actually submitted to the relevant authorities. • Project documents of J-PRISM (II) Project Office in Samoa • Project documents compiled by OEEM. • Project documents • Meeting minutes of working group. • Waste collection plans	3. Counterpart personnel keep working in the field of SWM. 4. Budget for the project activities are allocated and disbursed timely from C/P agencies.
Activities	Inputs		Important Assumption
<Output 1> 1-1 To form a Working Group for the formulation of SSWMS. 1-2 Review the existing data and conduct supplementary baseline survey to grasp present situation and identify the issues. 1-3 Develop the draft SSWMS and action plan. 1-4 Discuss a necessary institutional, regulatory and financial arrangement to be taken to realize the revised SSWMS. 1-5 Build a consensus among the stakeholders on the revised SSWMS. 1-6 Finalize SSWMS and its action plan. 1-7 Develop an implementation plan of the revised SSWMS. 1-8 Hold and participate workshop to disseminate the above and obtain feedback on it. <Output 2> 2-1 Compile case studies that other states of FSM as well as other PICs can learn from (e.g. waste collection plans for municipalities produced under Output 3) 2-2 Send (resource) persons to seminar and training sessions in other states of FSM as well as in other Pacific Island countries (PICs) to share the lessons learned. 2-3 Provide in-country training to visitors and trainees from other states of FSM as well as other PICs. <Output 3> 3-1 Re-formulate a working group (WG) to formulate waste collection plans (Chair: KIRMA, participating agencies are DT&I and four municipalities) 3-2 Identify issues and challenges of waste collection based on the understanding of the current situations in four municipalities in order to extract factors and conditions to formulate waste collection plans by WG. 3-3 Formulate waste collection plan	The Japanese Side 1. Dispatch of experts 2. Training 3. Local cost for the activities of experts 4. Necessary cost and equipment	The Kosrae Side 1. Allocation of counterpart 2. Office space and facilities for Japanese experts 3. Operational expenses for administrative work, transportation, training, and seminar, etc.	Cooperation of municipalities and community people of the target areas are obtained. <div style="text-align: center;">  <Issues and countermeasures> <div style="text-align: center;">  </div> </div>

Note

1) OEEM stands for Office of Environment and Emergency Management.

2) Output1 is considered as produced by achieving the indicator 1-1.

3) Target quantities of indicators for Output 2 will be set only after the related region-wide activities are decided by OEEM as well as J-PRISM (II) Project Office in Samoa.

Note

1) OEEM stands for Office of Environment and Emergency Management.

2) Output1 is considered as produced by achieving the indicator 1-1.

3) Target quantities of indicators for Output 2 will be set only after the related region-wide activities are decided by OEEM as well as J-PRISM (II) Project Office in Samoa.

ANNEX C Republic of Marshal Islands

Table of Contents

Republic of Marshal Islands

C-1 List of relevant information	1
C-2 Plan of Operation	3
C-3 PDM.....	5

■ List of relevant information

No.	Deliverables/relevant materials	Date	Description
1	Styrofoam Cups and Plates, and Plastic Products Prohibition, and Container Deposit Act 2016	Sep. 2016	Current Container Deposit Legislation (Amendment is required.)
2	Implementation Planning for Introduction of Container Deposit Legislation into the Marshall Island	Nov. 2017	CDL expert compiled necessary preparations and plans for introducing CDL as part of the activities of JPRISM.
3	The Recycling Program Regulations	Approved in Jun. 2018	Regulations on amended CDL Law.
4	A preliminary Survey on CDL for Pohnpei, Chuuk of FSM and Majuro of RMI	Aug. 2017	Prepared by CDL expert on introduction of CDL in Pohnpei, Chuuk and Majuro.
5	Implementation Planning for Introduction of Container Deposit Legislation into Majuro	Nov. 2017	Prepared by CDL expert
6	CDL Implementation Phase Mission Report 1	Apr. 2018	Mission report by the CDL expert just before commencement of CDL in Majuro including Regulation, draft contract between EPA and MAWC, refund procedure to MOF.
7	CDL Implementation Phase Mission Report 2	Jun. 2018	Mission report by the CDL expert just before commencement of CDL in Majuro including public awareness, notice to beverage importers and so on.
8	CDL Implementation Phase Mission Report 3	Oct. 2018	Mission report by the CDL expert just after commencement of CDL in

			Majuro including analysis of financial data, recommendation of utilization of collected PET behind sea wall.
9	CDL Implementation Phase Mission Report 4	Feb. 2019	Mission report by the CDL expert 6 months after commencement of CDL in Majuro including possible improvement measures.
10	TA-9225 RMI: Majuro Power Network Strengthening	Mar. 2018	Feasibility Report on WtE technology by ADB
11	TA-9242 Feasibility Study for Waste to Energy Options on Majuro Atoll	Jul. 2019	ICR for WtE by COWI financed by ADB.
12	FEASIBILITY STUDY FOR WASTE-TO-ENERGY OPTIONS, MAJURO ATOLL, RMI	30 th Sep. 2020	PPT to explain the FS Final Report on WtE of COWI funded by ADB
13	Garbage Collection Fee Ordinance Ebeye	Sep. 2014	Ordinance on waste collection fees in Ebeye
14	Landfill Operation at Lagoon Side Majuro	Dec. 2020	PPT to guide landfilling operation in the extended landfill site at lagoon side in Majuro
15	Solid Waste Management Plan for Majuro	Approved in 28 th July 2020	Policy paper on Solid Waste Management in Majuro.
16	Kwajalein Atoll Solid Waste Management Plan	Approved in 18 th October 2018	Policy paper on Solid Waste Management in Ebeye.

Project Design Matrix

Project Title: Japanese Technical Cooperation for Promotion of Regional Initiative on Solid Waste Management in Pacific Island Countries Phase II (J-PRISM II)

Implementing Agency: (Main) MWIU/ MAWC/ KALGov (Supporting) OEPPC/ EPA

Target Group: Officials of MWIU/ MAWC/ KALGov/ OEPPC/ EPA

Period of Project: 2017 - 2021 (Five Years)

Project Site: Majuro and Ebeye

Version 2

Dated: 8 February 2019

Narrative Summary		Objectively Verifiable Indicators	Means of Verification	Important Assumption
Overall Goal Sustainable management of solid waste in the Pacific region is enhanced based on Pacific Regional Waste and Pollution Management Strategy 2016-2025 (Cleaner Pacific 2025)				
Project Purpose (Region-wise) Human and institutional capacity base for sustainable Solid Waste Management in the Pacific region is strengthened through implementation of Cleaner Pacific 2025. (Country) Creation of solid waste management system is promoted.		1. Current SWM situation is technically as well as quantitatively analyzed and understood. 2. SWM challenges are identified. 3. Measures to tackle identified SWM challenges are proposed.	•Contents of policy documents	1. Natural disaster would not drastically affect the collaboration among participating countries. 2. Political changes of participating countries would not affect drastically the collaboration among them.
Outputs Output 1: Policy documents necessary to improve SWM system are officially submitted to the relevant authorities. (Note) Policy documents here means i) SWM Plan for MAWC, ii) SWM Plan for KALGOV, iii) National Waste Management Strategy (NWMS) in line with CP2025. Output 2: Good practices of solid waste management /3R are promoted in the country and the region. Output 3: CDL mechanisms suitable to RMI are explored by relevant authorities		[MAJURO] 1-1 The SWM Plan for MAWC (final version) is submitted to the relevant authority. [KALGOV] 1-2 The SWM Plan for KALGOV (final version) is submitted to the relevant authority. [National] 1-3 The NWMS (final version) in line with CP2025 is formulated and submitted to the Cabinet. 2-1 What is learned from the training organized by J-PRISM (II) Project Office is utilized. 3-1 Guideline on implementation procedure such as measurement, accounting and data collection is prepared.	•Project documents such as progress reports •A SWM Plan for MAWC •A SWM Plan for KALGOV •A NWMS •Project documents of J-PRISM (II) Project Office in Samoa •Project documents (draft laws and regulations, guideline)	3. Counterpart personnel keep working in the field of SWM. 4. Budget for the project activities are allocated and disbursed timely from C/P agencies. (NWMS) 5. The lead agency for formation of NSWMS shall be assigned with agreements of key stakeholders, and the agency shall allocate enough human resources as counterpart officials.
Activities	Inputs		Important Assumption	
<Output 1> A SWM Plan for MAWC 1-1 To form a Working Group for the formulation of A SWM Plan for MAWC. (WG is headed by G.M of MAWC and other important staffs of MAWC, J-PRISM(II) experts.) 1-2 Review the existing data and conduct supplementary baseline survey to grasp present situation and identify the issues. 1-3 Develop a SWM Plan for MAWC (draft). 1-4 Discuss a necessary institutional, regulatory and financial arrangement to be taken to realize a SWM Plan for MAWC(draft). 1-5 Build a consensus among the stakeholders on a SWM Plan for MAWC (final version). 1-6 Submit the plan (final version) to the relevant authorities. <u>Key players: MAWC and J-PRISM2 experts.</u> A SWM Plan for KALGOV 1-7 To form a Working Group for the formulation of A SWM Plan for KALGOV. (WG is headed by City Manager of KALGOV and other important staffs of KALGOV, J-PRISM (II) experts.) 1-8 Review the existing data and conduct supplementary baseline survey to grasp present situation and identify the issues. 1-9 Develop a SWM Plan for KALGOV (draft). 1-10 Discuss a necessary institutional, regulatory and financial arrangement to be taken to realize a SWM Plan for KALGOV(draft). 1-11 Build a consensus among the stakeholders on a SWM Plan for KALGOV (final version). 1-12 Submit the plan (final version) to the relevant authorities. <u>Key players: KALGOV and J-PRISM2 experts.</u> A NWMS 1-13 To form a Working Group for the formulation of NWMS. (WG is headed by OEPPC, and supported by SPREP) 1-2 Review the existing data obtained through formulation of SWM plans for MAWC and KALGOV. 1-14 Develop the new NWMS(draft). 1-15 Submit new NWMS (final version) to the relevant authorities. <u>Key players: OEPPC and SPREP.</u> <Output 2> 2-1 Compile case studies that other countries can learn from. 2-2 Send (resource) persons to seminar and training sessions in the region to share the lessons learned. 2-3 Provide in-country training to visitors and trainees from other island countries.	The Japanese Side	The RMI Side		1. Allocation of counterpart 2. Office space and facilities for Japanese experts 3. Operational expenses for administrative work, transportation, training, and seminar, etc.
	1. Dispatch of experts 2. Training 3. Local cost for the activities of experts 4. Necessary cost and equipment			

<p><Output 3> 3-1 Conduct preliminary survey to grasp the current situation. 3-2 Study technical requirements to amend the existing CDL law and draft necessary regulations. 3-3 Explore appropriate monitoring and contractual arrangement between EPA and the System Operator which are essential to start-up CDL. 3-4 Estimate budget to capitalize the Recycling Fund to cover the excess cans and bottles that will come in to the system in the first year. 3-5 Explore practical mechanism for the System Operator (most probably MAWC) such as measurement, accounting and data collection, etc.</p>			<p>Pre-conditions</p>  <p><Issues and countermeasures></p>
--	--	--	---

(Note)

SWM: Solid Waste Management
 EPA: Environmental Protection Authority
 NWMS: National Waste Management Strategy

MWU: Ministry of Works, Infrastructure and Utilities
 MAWC: Majuro Atoll Waste Company KALGOV: Kwajalein Atoll Local Government
 OEPPC: Office of Environment Planning and Policy Coordination

ANNEX D Capacity Assessment

1 Capacity Assessment (CA)

1.1 Purpose of Capacity Assessment (CA)

There is no absolute and permanent solution for solid waste problems, since the nature of problems change along with socio-economic changes that every society inevitably experience over time. Thus, J-PRISM2 emphasizes the importance of capacity development (CD) throughout the Project period to enhance the capacity of counterpart officials to tackle such difficult tasks. The team explained the importance of CD and notified counterpart officials of the Project intention to implement capacity assessments to measure the progress of capacity development.

The results of the capacity assessment both at the baseline and the endline are explained in the following sections.

1.2 Method of Capacity Assessment

Based on the CA Checklist, the baseline CA at organizational level as well as at institutional and social level was carried out through discussions with counterpart officials in 2017. On the other hand, In view of the current travel restriction, the endline CA was implemented by a team of experts.

Table 3-1: Target Organizations of CA

	Country	Target organizations
1	FSM Yap	DPWT/ EPA
2	Chuuk	DTPW/ EPA
3	Pohnpei	T&I/ PWMC/ EPA
4	Kosrae	DTI/ KIRMA
5	RMI Majuro	MAWC
6	Ebeye	KALGOV
7	PALAU	BPW-SWM/ KSG-SWM

1.3 Result of CA

1.3.1 Methodology

a. Institutional and Social Level

By considering the current situation of solid waste management in the three target Micronesian countries – Palau, RMI, FSM – 24 questions, which are highly relevant and representative, were selected out of approximately 50 broad questions, and analyzed from five evaluation criteria as shown in the following table. As for each question, one (1) for “yes”, 0.5 for “partially yes” and zero (0) for “no” are applied and the average figures were calculated.

Table 3-2: Evaluation Items at Institutional and Social Level

	Evaluation Item	Evaluation Questions
1	Institutions and policies at national/state levels	<ul style="list-style-type: none"> ▪ Are national SWM strategies and attached action plans approved? ▪ Does national SWM strategy incorporate monitoring indicators and target figures related to performance indicators set in Cleaner Pacific 2025? ▪ Is action-wise implementing agency identified in the action plans? ▪ Are basic laws, rules and regulations regarding SWM formulated? ▪ Are definitions of solid (general) waste provided in related laws, regulations and guidelines? ▪ Are EIA-related laws and regulations formulated? ▪ Are effluent standards from treatment plants and final disposal sites established? ▪ Do laws and regulations for land acquisition exist?
2	Institutions and policies of local governments	<ul style="list-style-type: none"> ▪ Are obligations and penalties set by bylaws? ▪ Are business entities registered/ understood by the issued permissions, etc.? ▪ Does a solid waste management plan exist?
3	Citizen's capacities	<ul style="list-style-type: none"> ▪ Do people consider that littering wastes in public places is unethical? ▪ Is littering on roads reduced (in other words, whether waste amounts collected by road sweeping are reduced)? ▪ Do citizens abide by the rules of discharge? ▪ Are citizen willingness to pay for the collection fee? ▪ Are cleaning activities organized by communities? ▪ Are recycling activities such as separate discharge organized by communities? ▪ Are educational materials for solid waste management developed? ▪ Have environmental educational activities for communities and societies been carried out and been participated in by citizens?
4	Relevant actors (NGOs/CBOs)	<ul style="list-style-type: none"> ▪ Are NGOs and CBOs interested in working in the area of solid waste management?
5	Partnership	<ul style="list-style-type: none"> ▪ Are there opportunities to discuss the waste issues among stakeholders? ▪ Are the system to make complaints from citizens established? ▪ Have numbers of complaints been reduced? ▪ Is operational mechanism to respond complaints from citizens established and implemented?

b. Organizational Level

Similar to the assessment at the institutional and social level, 73 highly relevant questions to the target Micronesian countries out of more than 160 questions were selected for assessment at the organization level and analyzed from nine evaluation criteria. As for each question, one (1) for “yes”, 0.5 for “partially yes” and zero (0) for “no” are applied and the average figures were calculated.

Table 3-3: Evaluation Items at Organizational Level

	Evaluation Item	Evaluation Questions
1	Basic information, data and future plans	<ul style="list-style-type: none"> ▪ Do you know the number of residents and the number of households in each administrative area? ▪ Do you have geographical data such as maps and GIS data? ▪ Do you know the SWM-related activities implemented by other donors? ▪ Do you know the SWM-related activities implemented by NGO/ CBOs? ▪ Can WACS be conducted by yourselves? =Is waste amount and composition known to you? ▪ Is quantitative waste flow prepared? ▪ Do landfill operators record and report the results of weighting at landfills or the number of incoming collection vehicles by type? ▪ Does implementing agency know the waste generation rate by household? ▪ Does implementing agency know the waste generation rate by each generation source other than household i.e. hotels, hospitals and business entities? ▪ Does the implementing agency recognize the demand for new landfills? ▪ Does the implementing agency start selection of candidate sites? ▪ Does the implementing agency start securing financial sources ? ▪ Is there a future plan related to SWM?
2	Organizational structure of implementing agency	<ul style="list-style-type: none"> ▪ Do you have organization charts and know the number of staff in charge at each relevant department of such organizations and institutions? ▪ Do policy makers such as the Governors or the Mayors put priorities on the improvement of SWM? ▪ Do decision makers recognize what needs to be done to solve the problems? ▪ Is the appropriate number of staff allocated in a manner suited to the scale and nature of work at each section?

		<ul style="list-style-type: none"> ▪ Is training opportunity provided regularly?
3	Financial information and arrangement	<ul style="list-style-type: none"> ▪ Do you have balance sheets (budget, revenue and expenditure) for the last three years? ▪ Do you know the proportion of your SWM budget to its total budget? ▪ Do you know the details of SWM budget? ▪ Do you know the financial sources for the SWM budget? (financial amount and sources) ▪ Can costs of collection/transportation, intermediate treatment and final disposal be calculated separately? ▪ Are you able to explain calculation method of consignment amount? (Check the contract document) ▪ Do you know the amount of income incurred by SWM-related activities such as sales of aluminum cans? ▪ Do you know who manages the above income? ▪ Is collection fee is collected based on the fee list for each type of wastes or waste service users? ▪ (only when 36 is yes) Are collected fees counted as income? ▪ Is tipping fee is collected based on the fee list for each type of wastes or waste service users? ▪ (only when 38 is yes) Are collected fees counted as income?
4	Collection	<ul style="list-style-type: none"> ▪ What kind of rules for storing and placing waste for collection are regulated? ▪ (only when 56 is yes) Do residents abide by the rules? ▪ Are the collection areas established and indicated in the maps? ▪ Is the population of each area recorded? ▪ Is the collection area by implementing agency well-known by stakeholders and residents? ▪ Does the implementing agency know how residents discharge wastes? ▪ Are the wastes collected according to the collection calendar? ▪ Does the implementation agency understand the nature and trend of complaints? ▪ Are collection routes and collection frequency set up and followed?
5	Transportation	<ul style="list-style-type: none"> ▪ Are operation records of collection vehicle prepared and monitored? ▪ Does the implementing agency review collection efficiency (regularly)? ▪ Do the drivers understand the vehicle operation schedule well?

6	Intermediate treatment	<ul style="list-style-type: none"> ▪ Currently, is intermediate treatment implemented ? (Container deposit, compost, oiled, etc.) ▪ Is condition of facility management and management system appropriate? ▪ Does the implementing agency record the waste volumes handled in each facilities? ▪ Does the implementing agency know income and expenditure of each treatment facilities/methods?
7	Final disposal	<ul style="list-style-type: none"> ▪ Is there a design drawings of the final landfill site? ▪ Does the implementing agency keep track of the haulage volume by type (e.g. of waste generators who carry in wastes) (Check the log) ▪ Is leachate treated? ▪ Are gas ventilation pipes constructed and are generated gas controlled? ▪ Is access road to the landfill site properly/ regularly maintained? ▪ Is the road within the landfill site properly/ regularly maintained so that the collection vehicles can unload the wastes at the designated point? ▪ Is environmental monitoring done within the landfill site and the surrounding area (survey of groundwater quality)? ▪ Does landfill manager record disposed waste by source at the entrance of landfill? ▪ Does the implementing agency record the waste quantity brought by industry and business? ▪ Does the implementing agency set the tipping fee for business/industrial waste? ▪ Does the implementing agency know the number, site, and condition of landfill other than regular landfill? (Community dumping site, illegal dumping site, etc.) ▪ Have EIA done for the current landfill site? ▪ Are EIA or any other surveys necessary for the new landfill site?
8	Equipment	<ul style="list-style-type: none"> ▪ Does the implementing agency have the list of collection equipment owned? ▪ Does the implementing agency know which equipment is in [out of] service? (Check the fleet operation records) ▪ Is the training for maintenance personnel carried out? (Contents; frequency) ▪ Does the implementing agency have landfill equipment such as rolling compactor trucks and excavators? ▪ Is the training for maintenance personnel appropriate? (Contents; frequency)

		<ul style="list-style-type: none"> ▪ If the units are out of service, are the reasons why and measures to take clear?
9	Indicators of CP2025	<ul style="list-style-type: none"> ▪ Does the implementation agency understand definition of per capita generation of MSW? (=Does the implementing agency know per capita generation of MSW?) ▪ Does the implementing agency understand definition of recycling rate? (=Does the implementing agency know recycling rate?) ▪ Does the implementing agency understand definition of waste collection coverage (% of population)? (=Does the implementing agency know waste collection coverage (% of population?) ▪ Does the implementing agency understand definition of port waste reception facilities? (=Does the implementing agency know how much of port/ship waste they have received?) ▪ Does the implementing agency understand definition of composting programs? (Does the implementing agency promote or implement composting programs?) ▪ Does the implementing agency understand definition of waste collection rate by weight (quantity ratio) ? (=Does the implementing agency know collection rate by weight?) ▪ Does the implementing agency understand (=set) definition of inappropriate final landfill sites?

1.3.2 Republic of Palau

a. Institutional and Social Level

The Palau's results of CA at institutional and social level are shown in the table and the figure below.

Table 3-4: Palau's CA Result at Institutional and Social Level

No.	Evaluation Item	Baseline	Endline
1	Institutions and policies at national level	0.69 Basic environmental laws and regulations exists, and the national SWM strategy was also formulated and approved during J-PRISM1. Thus, basically, the scoring of this criteria is high. Since it is time to revise the strategy, the draft of the new	1.00 Reasons for the improvement include the development of a new strategy in line with the basic principles of CP 2025, which has been approved by the Minister, and the fact that the new final disposal site in the Aimeliik is well operating

		strategy was formulated.	in line with the national environmental standards such as emission standards.
2	Institutions and policies of local governments	0.83 Local government assumed here is Koror State Government (KSG). KSG is the largest local government where approximately 70% of population in Palau live and state laws and regulations regarding environment have been in place. Thus, the scoring of this criteria is also quite high.	0.83 The Koror State Government (KSG) is the largest state in Palau, where 70% of Palau's population resides, and has a well-developed legal system, etc. Therefore, the point was higher than at baseline. No particular changes during the project period.
3	Citizens capacities	0.79 Citizen's cooperation has been increased by responding to the efforts made by the authorities, i.e. regular collection by KSG as well as implementation of CDL. Palau manages solid waste reasonably well. Indeed, it has the best management of the three Micronesian countries, and the citizens' participation level is good. The only reason Palau scored less than 1.00 is considered to be because the waste collection fee was introduced too early.	0.88 At the same time, another JICA project which encourage residents' participation in source separation had been carried out with BPW-SWM. In collaboration with these other schemes, BPW-SWM has actively engaged in community activities. As a result, the relevant indicator has also improved.
4	Relevant actors (NGO/CBO)	0.50 Since there are awareness officers in both BPW-SWM and KSG-SWM, and therefore the collaboration with NGOs are rather limited.	1.00 Through the activities of the JICA's other schemes mentioned above, the collaboration with NGOs and CBOs has been strengthened, and this point have also been improved.
5	Partnership	0.50 The communication between BPW-SWM and KSG-SWM is regular. The communication and information sharing with NGOs and state governments other than KSG is a challenge.	0.88 Under the leadership of the BPW-SWM, the inter-state collection has been initiated for the 10 states of Babeldaob Island. The actual collection has been outsourced to a private company, but regular meetings have been held with this private company and representatives of the 10 states, and cooperation with the private company and the provinces has substantially improved.

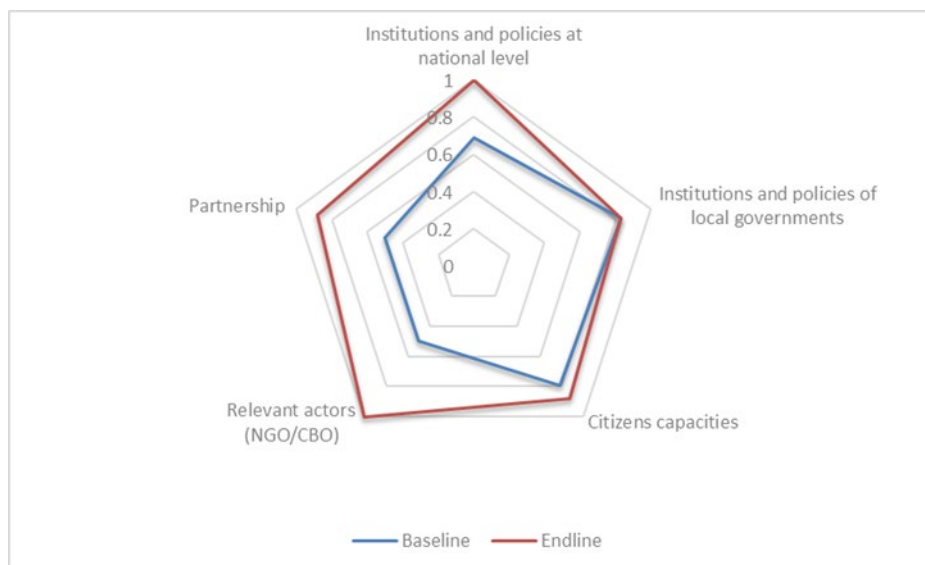


Figure 3-1: Palau's CA Result at Institutional and Social Level

b. Organizational Level

The results of CA at organizational level are shown in the table and the figure below.

Table 3-5: Palau's CA Result at Organizational Level

No.	Evaluation Item	Baseline	Endline
1	Basic information, data and future plans	0.65 Basic data is mostly available. However, challenges remain in the analysis phase. The quantitative and technical analysis of such data to produce waste flow is still lacking.	0.96 This item has improved because basic data has been collected through the baseline survey conducted during the project, and weighbridge data is also available at the new disposal site.
2	Organizational structure of implementing agency	0.90 Both BPW-SWM and KSG-SWM have a section dedicated solely for SWM, and decision-making mechanisms is clear. However, there is no internal regular training for employees. Currently training opportunities are provided mostly externally by donor agencies.	0.90 Both BPW-SWM and KSG-SWM have a section dedicated solely for SWM, and decision-making mechanisms is clear. However, there is still no internal regular training for employees. Currently training opportunities are provided mostly externally by donor agencies.
3	Financial information and arrangement	0.50 Both BPW-SWM and KSG-SWM have certain financial	0.80 Financial information is also being accumulated through

		information, but these financial data are not disaggregated by SWM categories, i.e. collection, transportation and final disposal.	project activities such as the SWM baseline survey.
4	Collection	0.94 As for Koror, KSG-SWM provides regular collection services to the entire state, and the collection situation is good.	1.00 In Koror, the state government is providing regular collection services to the entire residents. In addition, since early 2021, inter-state collection has begun on the island of Babeldaob, and the collection situation is improving nationwide.
5	Transportation	1.00 The status of transportation is also good. For example, after examining efficiency, KSG-SWM collects and transports wastes at night in certain areas.	1.00 In Koror, waste is efficiently collected and transported. In addition, since early 2021, collection and transportation on Babeldaob has also been carried out by a private contractor on a planned collection route.
6	Intermediate treatment	1.00 The status of intermediate treatment in Palau is excellent. In addition to the well-functioning CDL, KSG-SWM implements other intermediate treatment.	1.00 In addition to the sustainable operation of CDL, KSG-SWM continues its own other intermediate treatment.
7	Final disposal	0.81 Although the remaining capacity for the current landfill site is rather limited, the overall status of operation is good. As for the problematic old tires, BPW bought a shredding machine, and tried to reduce the volume at the landfill site. These efforts increased the scoring. Introduction of a tipping fee is another way of improving.	0.95 The situation is further improved by the fact that the new disposal site in Aimeliik, which has been in use since February 2021, is in good operational condition, and that the weighbridge is in place and thus introduction of tipping fee is being considered now.
8	Equipment	0.64 Minimum level of operation and maintenance (O&M) are regularly carried out, but opportunities of the O&M training for specific heavy equipment are insufficient. While countries like FSM and RMI have often received new equipment directly from the Embassy of Japan and therefore have had opportunities	0.89 In response to the identified lack of adequate training in the maintenance and management of collection vehicles and heavy equipment, J-PRISM II, in cooperation with the project office, conducted online training in the proper management of collection vehicles and heavy equipment.

		to receive training from the manufactures of such equipment, Palau has not received new equipment from donors and purchases second hand equipment with their own budget. As a result, Palau has not had such training opportunities.	Training for Palau was conducted on September 28, 2021, and the subregional training for the three Micronesian countries was conducted on March 2, 2022. The points have improved because of the opportunity to learn through participation in these training sessions. However, it should continue to be noted that opportunities beyond such donor-supported training remain limited.
9	Indicators of CP 2025	0.50 As explained in the section of "Basic information, data and future plans", the challenges to produce indicators required by CP 2025 remains.	0.71 As indicated in the evaluation item "Basic information, data and future plans," this item has improved due to progress in data collection through SWM baseline surveys and other activities under J-PRISM II.

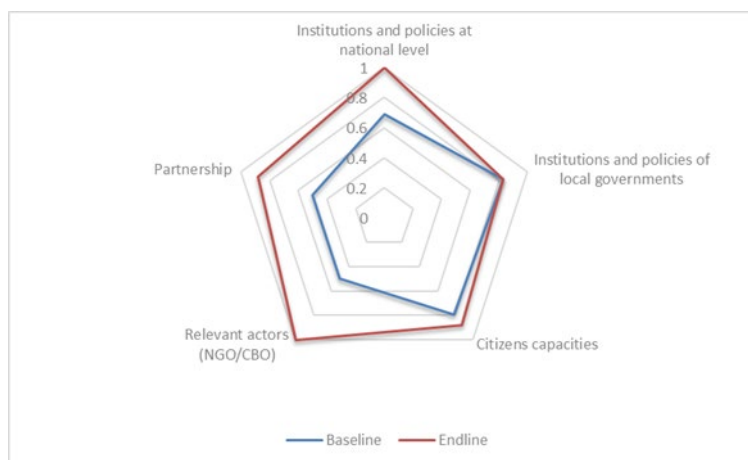


Figure 3-2: Palau's CA Result at Organizational Level

1.3.3 FSM

a. Institutional and Social Level

The FSM's results of CA at institutional and social level are shown in the table and the figure below.

Table 3-6: FSM's CA Result at Institutional and Social Level

No.	Evaluation Item	Baseline	Endline
1	Institutions and policies at national level	Y0.81 C0.83 P0.88 K0.79 Basic environmental laws and regulations exist, and the national SWM strategy was also formulated and approved during J-PRISM1. Thus, basically, the scoring of each state under this criteria are high.	Y0.94 C0.94 P0.94 K0.94 This item has been high in all states since the baseline for the reasons listed on the left, but has further improved since the SWM baseline survey was conducted by J-PRISM II as part of the formulation of each state's waste management strategy.
2	Institutions and policies of local governments	Y(N.A.) C0.50 P0.67 K0.33 Due to the different degrees of local government maturity, scoring under this criteria among states differ. For example, although communities are called municipalities in Yap, the heads of municipalities are not elected by the residents, and neither do these municipalities provide public services. Thus, this evaluation criteria is not at all applicable to Yap.	Y(N.A.) C0.83 P0.83 K0.67 In the four states of FSM, the maturity of the local government system remains very different in each state. Also, J-PRISM II has different activities that involve local governments, such as collection improvements, which has led to improvements in this assessment item in all provinces except Yap.
3	Citizens capacities	Y0.83 C0.38 P0.86 K0.75 While "yes" is replied to questions such as "Do people consider that littering wastes in public places is unethical?" and "Is littering on roads reduced?" in three states, namely Yap, Pohnpei and Kosrae, where CDL is introduced, the same questions are answered as "no" in Chuuk where CDL has not been functioning; therefore Chuuk scores substantially lower in this criteria than the other municipalities. This shows the importance of whether a public administration can set up a system that citizens can easily cooperate and participate in.	Y0.93 C0.69 P0.75 K0.88 The gap between states with functioning CDL and those without continues to exist. In another state, namely Chuuk, the EPA has taken the initiative in implementing composting projects under other JICA schemes, and as a result of the compost activity, point has improved.
4	Relevant actors (NGO/CBO)	Y0.50 C0.50 P0.50 K0.50 In every state, while there are NGOs working for environment in general, no NGOs that focus on waste issues; thus, a neutral score of 0.5 is given to all states.	Y1.00 C1.00 P1.00 K1.00 NGOs and CBOs that exist in each state have been actively engaged in activities related to waste management over the past several years. For example, the previously

			mentioned composting activities in Chuuk are being conducted in cooperation with women's groups, and in Kosrae, local NGOs purchased and distributed some wheelie bins for improved collection.
5	Partnership	Y0.13 C0.67 P0.50 K0.50 Under this criteria, regular meetings among stakeholders, mechanisms to respond towards complaints, etc. are asked. Since (i) numbers of stakeholders in each are limited and thus ad hoc meetings whenever necessity arises are enough and (ii) in the three states besides Chuuk, C/P organizations do not provide collection services (most complaints are directed at a municipality/organization that carries out collection services), the scoring for this criteria are at the lower end. Especially for Yap where the collection area is limited and contracted out, C/P organizations' involvement is even smaller; meaning it scored lowest.	Y0.50 C0.75 P0.63 K0.75 Under this criteria, regular meetings among stakeholders, mechanisms to respond towards complaints, etc. are asked. In Chuuk, the C/P agency has long been in charge of collection and transportation, and in Kosrae, where the inter-municipal collection was introduced, C/P agencies are now in charge of collection and transportation, which has led to a constant increase in opportunities for meetings among the parties concerned to improve actual operations and to respond to complaints, leading to an increase in points.

(Note) Y:Yap C:Chuuk P:Pohnpei K:Kosrae

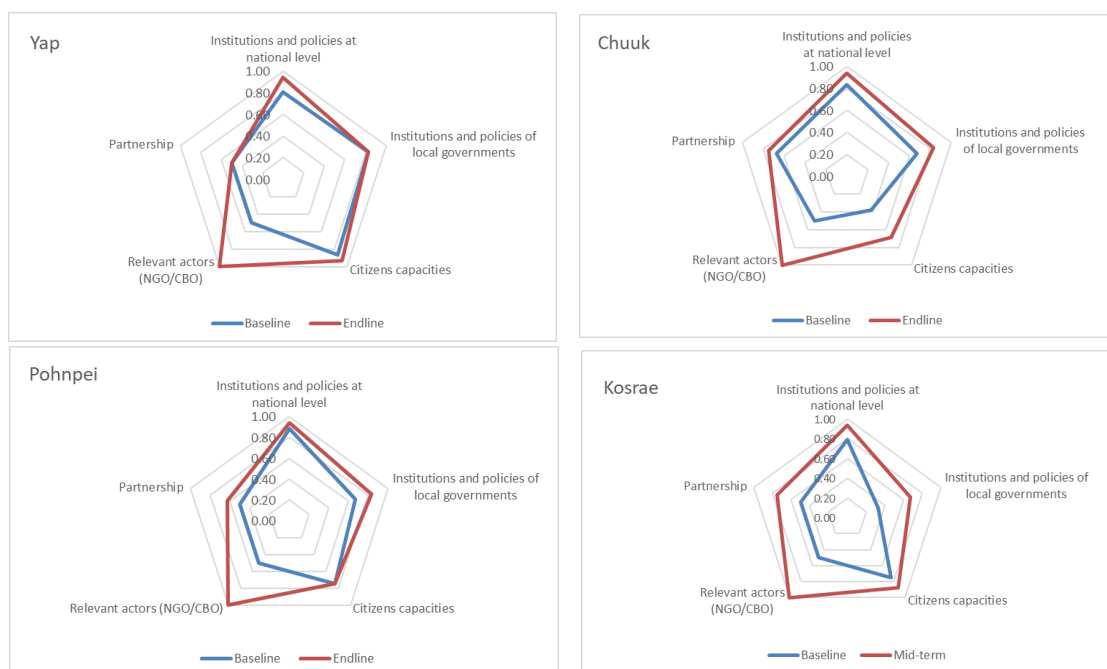


Figure 3-3: FSM's CA Result at Institutional and Social Level

b. Organizational Level

The results of CA at organizational level are shown in the table and the figure below. At this stage, there are two target institutions of CA in each state, namely public works and EPA/KIRMA. In addition, in Pohnpei and Kosrae local governments provide collection services; therefore, the team interviewed a few local governments of these two states. Since all these institutions share important roles and duties, the result is summarized in one diagram per state as seen below.

Table 3-7: FSM's CA Result at Organizational Level

No.	Evaluation Item	Baseline	Endline
1	Basic information, data and future plans	Y0.40 C0.46 P0.42 K0.55 Basic data is mostly available although its quality differs from state to state. Challenges remain in the analysis phase. The quantitative and technical analysis of such data to produce waste flow is still lacking.	Y0.73 C0.81 P0.88 K0.85 Under J-PRISM II, waste flow analysis based on SWM baseline surveys such as waste amount and composition survey and in-coming waste amount survey were conducted in each state, and thus significant improvements were observed.
2	Organizational structure of implementing agency	Y0.70 C0.60 P0.80 K0.90 Since counterpart organizations are mostly state institutions, the institutional setting as well as decision making mechanisms in each organization is rather clear. However, sometimes and in some states, the fund flow from the small sector grant (SSG) of U.S. Compact Fund complicates the relationship among state organizations. Usually some portion of SSG appropriated for the environmental sector is utilized for SWM, but the funds flows through EPA, not through the public-works related sections that actually implement SWM activities. So, it is essential to pay attention to the external factors such as U.S. Compact Fund in FSM. Also, opportunities of training are rather limited in most organizations in each state, except those provided by donor agencies.	Y0.80 C0.80 P0.90 K0.90 Since counterpart organizations are mostly state institutions, the institutional setting as well as decision making mechanisms in each organization is rather clear. In each state, a state solid waste management strategy has been developed and approved by the state governor, and now decision makers have a better understanding of waste management improvements. In addition, as part of the project activities, several training programs were conducted, including online training on the proper management of collection vehicles and heavy equipment, and points have improved due to active participation in such training programs.
3	Financial information and arrangement	Y0.45 C0.57 P0.45 K0.59 State organizations in each state have certain financial information, however this financial data is not disaggregated by SWM	Y0.68 C0.67 P0.75 K0.67 The point has improved as the relevant financial situation was understood better through developing the state's waste

		categories, i.e. collection, transportation and final disposal.	management strategy and through implementing project activities related to collection and transportation improvements, among others.
4	Collection	<p>Y(N.A.) C0.81 P0.88 K0.50</p> <p>In Yap, DPW&T has contracted out collection services of Colonia, the central part of the state to the private company. As for the other parts, basically public collection services are not provided. In Chuuk, DT&PW provided regular collection service (horn collection) along the main road. The collection situation in areas with access road is good, however the challenges remain in the area without access roads. In Pohnpei, the responsibility of collection lay with local governments. Through the interview with the Kolonia Town Government, it became apparent that the town government made efforts to provide services, however the ability to provide regular collection services could greatly differ from local government to local government. As for Kosrae also, local governments are responsible for waste collection. Here, interviews with Utwe municipality – one of the smallest municipalities that has just started provision of waste collection services -- are incorporated into the analysis.</p>	<p>Y(N.A.) C0.83 P0.94 K0.94</p> <p>In Yap, DPW&T has contracted out collection services of Colonia, the central part of the state to the private company. As for the other parts, basically public collection services are not provided. In Chuuk, the DTPW has been providing regular collection services along the paved roads on the main island using new compactor trucks procured through non-project type grant aid of Japan, and the collection situation is relatively good. In Pohnpei, although there is room for improvement, it was found that each municipality is using the compactor trucks and other equipment obtained through Japanese assistance to provide collection services. In Kosrae, inter-municipal collection has initiated under J-PRISM II, and the collection situation has greatly improved.</p>
5	Transportation	<p>Y(N.A.) C0.50 P0.33 K0.33</p> <p>Only DT&PW of Chuuk among the counterpart institutions in four states provides collection service directly to residents. In both Pohnpei and Kosrae, local governments provide such services to residents.</p>	<p>Yap, where C/P agencies do not directly provide collection and transportation services, is excluded. In Chuuk, where the DTPW is responsible for collection and transportation, the Department is aware of the basic operation of collection vehicles. In both Pohnpei and Kosrae, the situations are improving under the project activities that supported improvement of collection and transportation.</p>
6	Intermediate treatment	<p>Y1.00 C(N.A.) P0.63 K1.00</p> <p>CDL system functions in Yap,</p>	<p>Y1.00 C0.63 P0.75 K0.50</p> <p>CDL system functions in Yap,</p>

		<p>Pohnpei and Kosrae. CDL functions well in both Yap and Kosrae with regular purchase of recyclables, while CDL in Pohnpei has tremendous room to improve, such as privatization of operations with frequent purchase of recyclables. Currently, EPA in Pohnpei who operates the CDL system buy recyclables only three to four times a year. Therefore, the score for Pohnpei remains as low as 0.63 at this stage.</p>	<p>Pohnpei and Kosrae. In particular, in Yap, CDL continues to function well with regular purchases and good data management. In Kosrae, on the other hand, activities have stalled and points have been lowered. In Pohnpei, the point is improving due to the availability of relevant data and the progress of improvement activities. As for Chuuk, the point is improved because composting activities were implemented under other JICA schemes.</p>
7	Final disposal	<p>Y0.73 C0.12 P0.73 K0.83</p> <p>Except Pohnpei, where the management of disposal site is contracted out to the private company, public works-related departments of other three states are in charge of management of the final disposal sites. The level of operation is similar among the three states (e.g. the presence of watchmen, records of incoming vehicles, etc.) besides Chuuk – where a temporary dump site is used without watchmen. Considering this situation, the score of Chuuk became rather low compared to the other three states.</p>	<p>Y0.73 C0.05 P0.64 K0.86</p> <p>Currently, the operation and management of final disposal sites are outsourced to the private operators both in Yap and Pohnpei, and done by the State Departments in both Chuuk and Kosrae. The current level of operation is nearly the same (e.g., managers are present and the type of vehicles that brought in wastes are recorded) among three states with the exception of Chuuk. Chuuk lowered points because it still uses an interim disposal site and has not shown any improvement, including the lack of a permanent manager, which has led to a deterioration in the management of the disposal site.</p>
8	Equipment	<p>Y0.75 C0.71 P0.71 K0.80</p> <p>As for equipment, minimum level of maintenance is done somehow regularly, however, challenges remain when such equipment breaks down. Usually it is difficult to obtain spare parts, which are mostly not available on islands. These four states of FSM are fortunate to receive new equipment from the embassy of Japan (EOJ) along with the initial training from the manufactures. Such training is therefore a rare and valuable opportunity in these four states.</p>	<p>Y0.67 C0.72 P0.78 K0.88</p> <p>In the four states of the FSM, heavy equipment is provided mostly through the Japanese grant aid, and for such cases, training on maintenance and management is available from the manufacturers, which are in fact valuable training opportunities. In addition, as part of the project activities, online training in the proper management of collection vehicles and heavy equipment was conducted in each state.</p>

9	Indicators of CP 2025	<p>Y0.43 C0.43 P0.29 K0.43</p> <p>As detailed in the evaluation item, "Basic information, data and future plans", the challenges remain to collect and update technical data required by CP 2025.</p>	<p>Y0.71 C0.67 P0.57 K0.71</p> <p>As indicated in the evaluation item "Basic information, data and future plans," each state has conducted a series of SWM baseline survey and formulated state solid waste management strategies, and through such activities, technical data has been collected, which has improved the points.</p>
---	-----------------------	---	---

(Note) Y:Yap C:Chuuk P:Pohnpei K:Kosrae

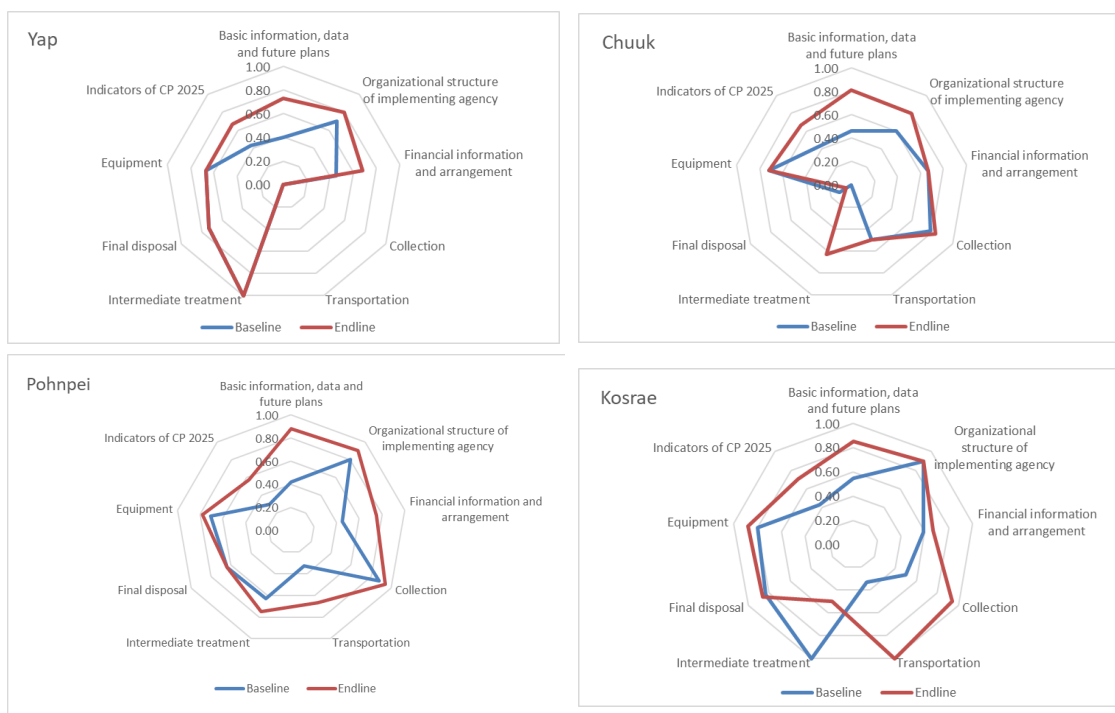


Figure 3-4: FSM’s CA Result at Organizational Level

1.3.4 RMI

a. Institutional and Social Level

The RMI’s results CA at institutional and social level are shown in the table and the figure below.

Table 3-8: RMI’s CA Result at Institutional and Social Level

No.	Evaluation Item	Baseline	Endline
1	Institutions and policies at national level	0.5 Basic environmental laws and regulations exist, however the national SWM strategy was not	0.69 Basic environmental laws and regulations are in place. In addition, during the project

		approved during J-PRISM1. Thus, basically, the score remains as 0.5.	period, there have been improvements in the legal system related to the beverage container deposit system, which have improved the indicators, but a national strategy has not yet been formulated.
2	Institutions and policies of local governments	0.67 Relevant local governments are both Majuro Atoll Local Government (MALGOV) and Kwajalein Atoll Local Government (KALGOV). Both are well-established local governments with substantial budgets and human resources, however, there is no solid waste management plans as such.	1.00 During the project period, waste management plans were developed for the cities of Majolo and Kwajalein ("Ebeye"). Both waste management plans have been approved by the Minister and the Mayor, respectively, and therefore the point improved.
3	Citizens capacities	0.69 Regular collection services are provided both in Majuro and Ebeye, and the public cooperates to place wheelie bins at the designated areas in this regard. Other public cooperation such as source separation were not so visible since CDL has not been introduced in both areas. This shows the importance of whether a public administration can set up a system that citizens can easily cooperate and participate in.	0.88 Regular collection services are provided both in Majuro and Ebeye, and the public cooperates to place wheelie bins at the designated areas in this regard, as at the baseline. During the project period, CDL were introduced in Majuro, and activities such as the collection of beverage containers were implemented with the cooperation of the residents, which improved the points.
4	Relevant actors (NGO/CBO)	0.50 While there are NGOs working for environment in general, there are no NGOs that focus on waste issues; thus 0.5 is given to this evaluation item.	1.00 Amidst growing global concern in marine plastics, the EPA took the lead in actively organizing cleanup activities together with local groups.
5	Partnership	0.50 Unlike four states of FSM, main responsible organizations for SWM in each area of RMI are explicit, namely Majuro Atoll Waste Company (WAWC) for Majuro and KALGOV for Ebeye. These two organizations are in charge of the entire SWM from collection and transportation to final disposal, and no services are contracted out to the private	0.63 The situation remains the same as at baseline. In addition, donor supports and other improvement activities are being discussed and coordinated among the parties concerned, such as PacWaste Plus, the successor project to PacWaste, as appropriate.

		<p>sector; therefore, the necessity to establish partnership with other organizations is rather limited currently.</p> <p>As for working with other donors through projects such as J-PRISM and PacWaste, usually committees are formulated for each project and all the relevant organizations and stakeholders communicated and collaborated under such committees.</p>	
--	--	---	--

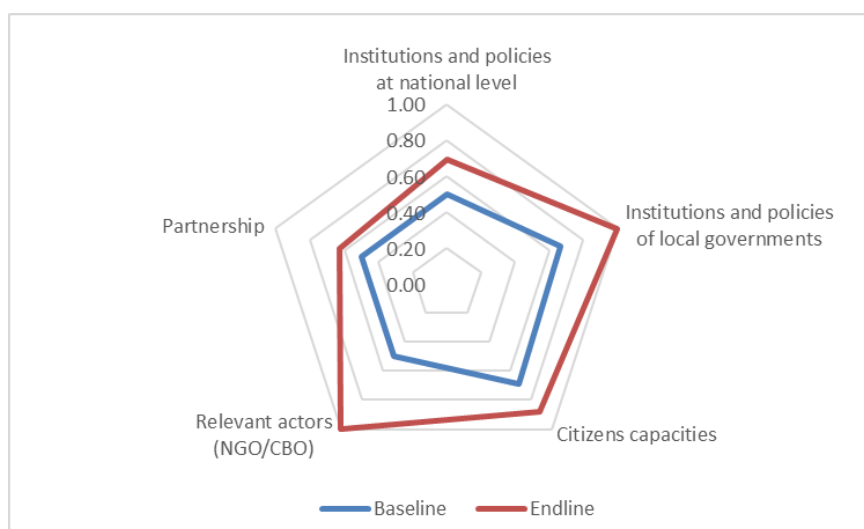


Figure 3-5: RMI's CA Result at Institutional and Social Level

b. Organizational Level

The results of CA at organizational level are shown in the table and the figure below. In RMI, there are two target institutions of CA, namely Majuro Atoll Waste Company (MAWC) and KALGOV.

Table 3-9: RMI's CA Result at Organizational Level

No.	Evaluation Item	Scoring and Remarks	
1	Basic information, data and future plans	<p>M0.46 E0.28</p> <p>While in Majuro, under the initiative of JICA senior volunteers dispatched to MAWC, basic data such as WACS data and incoming waste amounts have been accumulated, similar data is mostly not available in Ebeye.</p>	<p>M0.85 E0.78</p> <p>Waste management plans were formulated based on a series of SWM baseline surveys as part of project activities in the populated Majuro and Kwajalein atolls. As a result, in both atolls, waste flow analysis was conducted</p>

		Also, even in Majuro, the analysis of such data remains as a big challenge. The quantitative and technical analysis of such data to plan and operate SWM systematically is lacking.	and points were greatly improved.
2	Organizational structure of implementing agency	M0.50 E0.60 The institutional setting as well as decision making mechanisms in each organization is clear. Since MAWC is highly independent organization, separately from MALGOV, the Project team has not – as of the writing of this report – interviewed with the Mayor of Majuro, and therefore his opinion on the current SWM situation has not yet been clarified. (The team visited the mayor’s office in MALGOV in Oct. 2017, however he was out of the island.) As for KALGOV, the team has confirmed high commitment of the Mayor as well as the city manager through interviews with them.	M0.80 E0.90 The institutional setting as well as decision making mechanisms in each organization is clear. In addition, through the approval of the above waste management plans, the degree of involvement of decision makers such as the Minister of MWIU and the Mayor of Kwajalein Atoll Local Government has also increased, resulting in improved points.
3	Financial information and arrangement	M0.85 E0.14 MAWC has better financial information than KALGOV, since MALGOV is a pure-play SWM company with accounting information. On the other hand, SWM cost for Ebeye is amalgamated into the expenditure of the Dept. of Public Works of KALGOV, and therefore the cost used purely for SWM is unknown.	M0.90 E0.90 The point has improved because of the confirmation of the costs associated with waste management in the process of formulating waste management plans for both atolls.
4	Collection	M1.00 E0.88 Collection services are regularly provided by MAWC in Majuro and by KALGOV in Ebeye.	M1.00 E1.00 MAWC in Majuro Atoll and KALGOV in Kwajalein Atoll continue to conduct regular collections throughout the area, and the collection situation is good.
5	Transportation	M0.83 E1.00 Collected waste is transported properly in both areas. Also, both MAWC and KALGOV understand the operational	M0.83 E1.00 The transportation after collection continues to be properly carried out in both atolls. The basic operation of

		status of collection vehicles.	collection vehicles is also being monitored by MAWC and KALGOV. In island countries, vehicles and heavy equipment tend to be easily breakable and have a short life span, but with ample funds and donor support, renewals of such vehicles and equipment have been made as needed.
6	Intermediate treatment	<p>M0.50 E (N.A.)</p> <p>Newly introduced law regarding CDL in Oct. 2016 is now being reviewed for amendment, and actual implementation of CDL has not been started both in Majuro and Ebeye. Even without CDL system, in Majuro, as initiatives of MAWC, aluminum cans and car batteries have been bought in and shipped out regularly, while no such initiatives have as yet been undertaken in Ebeye.</p>	<p>M1.00 E (N.A.)</p> <p>After amending the CDL law and preparing the regulations, CDL operation began in Majuro in August 2018, and cans, bottles, and PET containers are being collected. On the other hand, in Ebeye, which is in the preparatory stage of implementation, there are currently no such activities.</p>
7	Final disposal	<p>M0.50 E0.09</p> <p>In Majuro, MAWC introduced a “gate fee,” which is imposed on incoming waste from commercial entities. This is an advanced initiative in this region, however, MAWC faces a more serious issue with the condition of final disposal site. Remaining life span of the existing disposal site is short, and even securing an access road is becoming difficult.</p> <p>In Ebeye, although the current disposal site can be used for long, the primary operation and maintenance of the final disposal site remains the biggest challenge as of May 2017. In fact, there are no watchmen and no records on incoming vehicles and waste. (Big bulldozer which is necessary for fundamental operation is also lacking.)</p>	<p>M0.77 E0.33</p> <p>In Majuro, the management of the final disposal site was a biggest challenge, but during the project period, construction of an extension to the lagoon side and an extension to the ocean side progressed, that are drastic improvement, is now underway. In Ebeye, the management of the landfill has been improved by building a gate and appointing a gatekeeper.</p>
8	Equipment	<p>M0.64 E0.64</p> <p>Equipment used for SWM both in Majuro and Ebeye are mostly</p>	<p>M0.78 E0.75</p> <p>Equipment provided by donors, mainly from the United States,</p>

		provided from donor countries such as U.S. and Taiwan. While operational status of such equipment is recorded somehow in each organization, the challenges remain with repair when such equipment breaks down. Usually it is difficult to obtain spare parts, which are mostly not available on atolls.	are used in both Majuro and Ebeye for waste management. Although challenges remain in operation and maintenance, points improved, as online training on proper operation and maintenance of collection vehicles and heavy equipment was provided by J-PRISM II.
9	Indicators of CP 2025	M0.36 E0.33 As detailed in the evaluation items, "Basic information, data and future plans", the challenges remain to collect and update technical data required by CP 2025.	M0.64 E0.71 As detailed in the evaluation items, "Basic information, data and future plans", Points improved as SWM baseline surveys were conducted and waste flow analysis was conducted in both atolls.

(Note) M: Majuro E: Ebeye

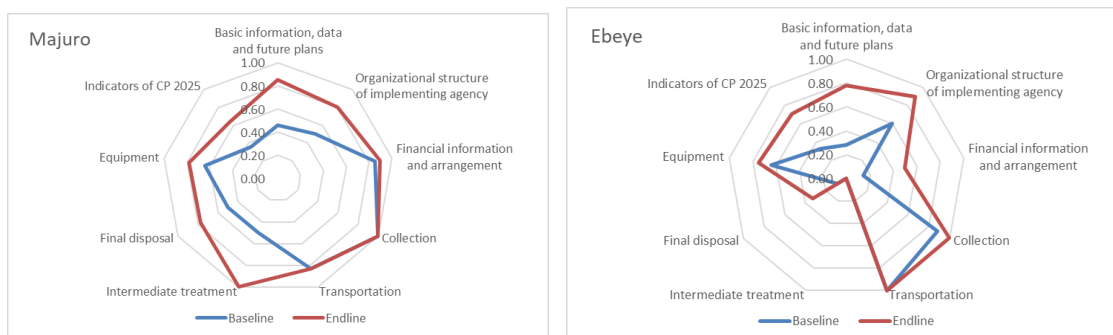
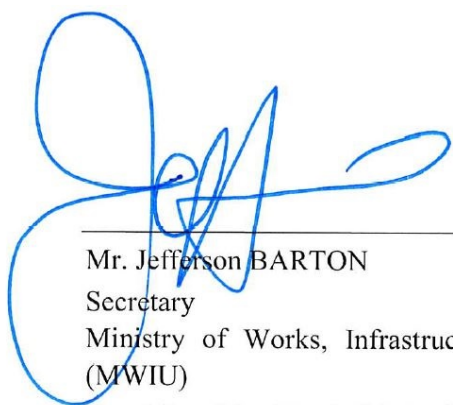


Figure 3-6: RMI's CA Result at Organizational Level

*ANNEX E Record of Final Joint
Coordinating Committee Meeting*

MINUTES OF MEETINGS
ON
THE FIFTH JOINT COORDINATING COMMITTEE OF
JAPANESE TECHNICAL COOPERATION PROJECT FOR
PROMOTION OF REGIONAL INITIATIVE ON SOLID WASTE MANAGEMENT IN
PACIFIC ISLAND COUNTRIES
PHASE II
(J-PRISM II)
IN
THE MICRONESIA REGION

Palau, On-line, 3rd June 2022



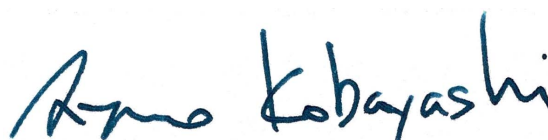
Mr. Jefferson BARTON
Secretary
Ministry of Works, Infrastructure and Utilities
(MWIU)
Republic of the Marshall Islands



Mr. Satoru MIMURA
Chief Advisor
Japanese Technical Cooperation Project For
Promotion of Regional Initiative on Solid Waste
Management in Pacific Island Countries Phase II
(J-PRISM II)



Mr. Andrew R. YATILMAN
Secretary
Department of Environment, Climate Change and
Emergency Management (DECHEM)
Federated States of Micronesia



Mr. Ryutaro KOBAYASHI
Chief Representative
JICA Palau Office
Japan International Cooperation Agency (JICA)



Mr. Brian MELAIREI
Director
Bureau of Public Works (BPW)
Ministry of Public Infrastructure and Industries
(MPII)
Republic of Palau

MAIN POINTS DISCUSSED

1. General views on the achievement of J-PRISM II activities

From Palau, together with Palauan participants, the fifth JCC meeting was held by connecting counterpart officials of FSM and RMI via the Internet. Participants shared the progress and achievement of J-PRISM II as well as their efforts to improve waste management even amid the difficulties caused by the pandemic. Also, by taking an advantage of the virtual setting, the meeting was participated by a wide range of participants from Embassies of Japan, JICA headquarters, and other donors, too. This valuable opportunity will further enhance cooperative relationship among countries as well as with partner agencies in the Micronesia region.

2. Specific issues discussed

At this fifth JCC meeting, the counterpart officials from each country and state explained the achievement of the outputs which were set to improve the issues specific to each country and state. In addition, many countries and states have been working earnestly on improvement activities that are not listed in the PDM and indeed been producing substantial results. In this occasion, the counterpart officials also presented such results and shared their learnings with other participants.

Also, key stakeholders, the counterpart officials and the J-PRISM II experts expressed their willingness to work together to obtain fruitful outcomes of the project for the rest of the project period.

Lastly, the parties acknowledge and agree that this Minutes of Meetings may be executed by electronic signature, which is considered as an original signature for all purposes and has the same force and effect as an original signature. “Electronic signature” includes faxed versions of an original signature or electronically scanned and transmitted version (e.g., via pdf) of an original signature.

ANNEX 1	List of participants
ANNEX 2	Presentation materials

No	Country/Organization	Designation	Name
1	RMI	MAWC	General Manager
2		MAWC	Assistant Manager
3		KALGOV	City Manager
4		KALGOV	Manager of Public Works
5		KALGOV	Technical Officer of Public Works
6		EPA	Chief of Education and Awareness
7	FSM(National)	DECEM	Deputy Assistant Secretary
8		DECEM	Sustainable Development Planner
9	FSM (Kosrae)	DT&I	Director
10	FSM (Pohnpei)	EPA	Technical Officer
11		KTG	Advisor to KTG
12	FSM (Chuuk)	DTPW	Director
13		EPA	Manager
14	FSM(Yap)	DPWT	Deputy Director
15		EPA	Executive Director
16	Palau	MPIIC-BPW	Director
17		MPIIC-BPW	Manager - SWM
18		MPIIC-BPW	SWM Coordinator - SWM
19		MPIIC-BPW	SWM Educator - SWM
20		KSG-SWM	SWM Advisor
21		KSG-SWM	Manager
22	SPREP/PacWaste Plus	Project Manager	Mr. Bradley Nolan
23	SPREP	Director of Waste Management and Pollution Control	Mr. Anthony Talouli
24	ADB	Representative of RMI Office	Ms. Ellen Paul
25		Representative of RMI Office	Ms. Denis Jack
26		USIP- Majuro	Mr. Chris Purchas
27	ICETT	Global Environment Department	Ms. Maki Tamura
28		Global Environment Department	Mr. Masaaki Osawa
29		Global Environment Department	Mr. Taiki Kuroda
30		Global Environment Department	Ms. Shiori Tsujino
31	EOJ RMI	Embassy of Japan in the RMI	Mr. Yuji Ito
32	JDS	Evaluation Consultant	Ms. Sugumi Tanaka
33		Senior Officer	Ms. Noriko Yamada
34	JICA HQ	Officer	Mr. Issei Hamana
35		Senior Advisor	Mr. Shiro Amano
36		Resident Representative	Mr. Hikoyuki Ukai
37	JICA RMI	Project Formulation Advisor	Mr. Yoshiki Narita
38		Program Officer	Mr. Mea Abraham
39	JICA FSM	Resident Representative	Mr. Keiichi Muraoka
40		Project Formulation Advisor	Mr. Thoshikazu Nonaka
41		Officer	Ms. Trish Billen
42	JICA Palau	Project Formulation Advisor	Mr. Yasutoshi Sagami
43		Offier	Ms. Aileen Takada
44	J-PRISM II/PO	Chief Advisor	Mr. Satoru Mimura
45		Assistant Chief Advisor	Mr. Faafetai Sagapolutele
46		Expert on 3R+Return	Dr. Yoko Onuma
47		Regional Cooperation Coordinator	Ms. Ayako Yoshida
48		Project Assistant	Ms. Evangeline Potifara
49	J-PRISM II/G1	G1 Team Leader	Mr. Ichiro Kono
50		G1 Dedputy Team Leader	Ms. Misa Oishi
51		G1 Expert on SWM	Ms. Ai Akami
52		G1 Expert on SWM	Mr. Kouji Kusunoki
53		G1 Expert on SWM	Mr. Shin Okamoto
54		G1 Expert on SWM	Mr. Alice Leney
55		G1 Expert on Maintenance of Equipment	Mr. Koji Uzawa

The Fifth JCC Meeting

Part 1

Achievement of J-PRISM II G1 (Micronesia Region)

Today's Programme

Time	Contents (Tentative)	Speaker
09:00 – 09:05	Background Information with tips of virtual meeting	J-PRISM G1
09:05 – 09:10	Opening Remarks	WPII-BPW JICA Palau Office
<<Photo Session>		
09:10 – 09:30	P1. Achievements of J-PRISM II Group 1 (Micronesia Region)	J-PRISM G1
09:30 – 09:55	P1. Country Achievement – RMI P2.1 Achievements & remaining challenges in Majuro (10 min) P2.2 Achievements & remaining challenges in Eoeye (10 min) -- 5-minute Q&A Session --	Majuro team Eoeye team
9:55 – 10:50	P1. Country Achievement – FSM P3.1 Achievements & remaining challenges - National (10 min) P3.2 Achievements & remaining challenges in Kosrae (10 min) P3.3 Achievements & remaining challenges in Pohnpei (10 min) P3.4 Achievements & remaining challenges in Chuuk (10 min) P3.5 Achievements & remaining challenges in Yap (10 min) -- 5-minute Q&A Session --	National team Kosrae team Pohnpei team Chuuk team Yap team
10:50 – 11:10	P4. Country Achievement – Palau P4.1 Achievements & remaining challenges in Palau (15 min) -- 5-minute Q&A Session --	Palau team
11:10 – 11:20	P5. Achievement of J-PRISM II (Regional)	J-PRISM PO
11:20 – 11:25	P5. Discussion and confirmation of Minutes of Meetings	All
11:25 – 11:30	Closing Remarks	J-PRISM PO

Today's Participants

1. Key officials of three countries, four states and two atolls
2. J-PRISM II experts from Project Office in Samoa, Group1 and Group2
3. Officials of JICA HQ and JICA Offices of three countries
4. Officials of Embassy of Japan in each country
5. Other key stakeholders, for example officials of SPREP, ADB, ICETT, and etc.

Implementation of J-PRISM II - 1

- Originally five-year technical cooperation project commenced in 2017.
- Now its period is extended for 6 months in the Micronesia Region.

Fiscal Year	2017				2018				2019			
	I	II	III	IV	I	II	III	IV	I	II	III	IV
Quarter												
Month	4	5	6	7	8	9	10	11	12	1	2	3
Year wise Contract	1st Year				2nd Year				3rd Year			
JCC Meeting			No 1 JCC				No 2 JCC				No 3 JCC	
Palau			▼ 1/30				▼ 2/18				▼ 1/30	
FSM		▼ 9/27					▼ 9/25				▼ 9/25	
Yap							▼ 9/28					
TKK							▼ 10/11					
PNI							▼ 10/4					
KSA							▼ 10/4					
RMI			▼ 11/02				▼ 2/8					▼ 2/8

Implementation of J-PRISM II - 2

- JCC meeting is basically organized annually, except 2020, due to Covid.
- After Covid, J-PRISM activities have been carried out virtually.

Fiscal Year	2020				2021				2022			
	I	II	III	IV	I	II	III	IV	I	II	III	IV
Quarter												
Month	4	5	6	7	8	9	10	11	12	1	2	3
Year wise Contract	4th Year				5th Year				will be extended			
JCC Meeting									No 4 JCC - Virtually Ind. Sup. Regionally			No 5 JCC in Palau
Palau									▼ 5/20			▼
FSM									▼ 5/20			▼
Yap									Covid 19 Conflict			
TKK												
PNI												
KSA												
RMI									▼ 5/20			▼

Implementation of J-PRISM II - 2

After Covid, conducted web-based discussions and provided technical assistance to CPs in each country.

No. of web-meetings

- Palau: 24 times
- FSM
 - National: 13 times
 - Yap: 19 times
 - Chuuk: 21 times
 - Pohnpei: 25 times
 - Kosrae: 15 times
- RMI: 24 times

7

Implementation of J-PRISM II - 2



8

Part 2

Part 2

Achievements in the Micronesia Region

Output-wise achievement

- Formulation of Solid Waste Management Strategies and Plans (Output 1)
- Sharing knowledge and experiences (Output 2)

- Country specific outputs
 - Collection improvement
 - CDS Introduction
 - Landfill improvement



Will be presented by J-PRISM Expert



Will be presented by C/P officials

10

Achievements in the Micronesia Region

Formulation of Solid Waste Management Strategies and Plans (Output 1)

Formulated strategies and plans in two steps: i) understanding the current situation quantitatively as well as technically, and ii) formulate strategies and plans to tackle identified issues.



Country	Title	Endorsement
Palau	National Solid Waste Management Strategy 2017-2026	By Minister of MPIL on 2019 Jan. 30
Yap	Yap State Solid Waste Management Strategy 2018-2027	By Governor on 2018 Sep. 14
Chuuk	Chuuk State Solid Waste Management Strategy 2019-2028	By Governor on 2018 June 29
Pohnpei	Pohnpei State Solid Waste Management Strategy 2020-2029	By Governor on 2019 Oct. 29
Kosrae	Kosrae State Solid Waste Management Strategy 2018-2027	By Governor on 2018 May 28
Majuro	Solid Waste Management Plan for Majuro 2019-2028	By Minister of MWIU on 2020 July 28
Ebeye	Kwajalein Atoll Solid Waste Management Plan 2019-2028	By Mayor on 2018 Oct. 18

11

Achievements in the Micronesia Region

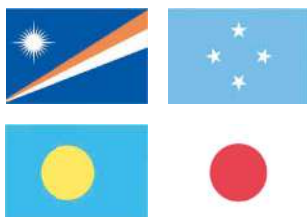
Sharing knowledge and experiences (Output 2)

- Training on landfill management in Palau, February 2018
- Disaster waste management (DWM) workshop in Palau, February 2019
- Trainings on Proper Preventive Maintenance of Garbage Collection Vehicle and Heavy Machinery” for Micronesian region 2021-22
- SWM Workshops in FSM 2017 and 2019
- Compilation of Good Practices
 - Compiled and uploaded on <https://www.sprep.org/j-prism-2/lessons-learn1>
 - FSM (DECEM) compiled one and now compiling another booklet





Arigato



The Fifth JCC Meeting: Country Achievements

RMI - Majuro

Country Achievements: RMI-Majuro



Achievements specific to Majuro

Output 3: Introduction of Container Deposit Scheme

Through a series of consultations and technical discussions since the beginning of J-PRISM2, CDS was successfully launched in August 2018 and has been operated smoothly since then.

Other Important Activity: Landfill Improvement

In accordance with the Solid Waste Management Plan for Majuro, i) lagoon side extension, cell 1 and cell 2 were constructed and ii) ocean side extension is in progress.

Country Achievements: RMI-Majuro



CDS Introduction in Majuro

Background : 『Styrofoam Cups and Plates, and Plastic Product Prohibition, and Container Deposit Act』 enacted in 2016 and the strong political commitment

Support from J-PRISM2.

- Aug 2017: Preliminary survey done by J-PRISM2: The need for legal reform becomes apparent. Email-based, supporting legal reform.
- Jan 2018: Act was amended.
- Support for the formulation of the recycling program regulations : Regulation was drafted and attending Public Hearing.
- Technical assistance to Custom, EPA, MAWC
- June 2018: The regulation was approved.
- August 2018: Inauguration of CDS in Majuro!

Country Achievements: RMI-Majuro



Technical discussion among EPA, MAWC, Custom and JPRISM team



Explanation at the meeting of RMI Chamber of Commerce



Cans being placed in the press machine at MAWC (redemption center)

FY	REFUND(piece) by categories				Deposited Amount		CDL rate
	Can	PET	Bottle	Total	USD	Piece	%
July 2018 – Dec 2019 (17)	11,869,418 (59%)	8,191,239 (40%)	177,894 (1%)	20,238,551 (100%)	1,234,276	20,571,262	98%

Cans: Export on a regular basis.

PETs: Plan to ship out PETs (clear type with no color) to a big packaging company called Visy in Australia using the Moana Taka program.

Country Achievements: RMI-Majuro



Landfill Improvement

- Landfill site at Batkan was over the capacity and Urgent development of new landfill site was biggest issue in Majuro.
- Government was realized the critical situation of landfill site and started to develop new landfill site in 2020.
- JPRISM II and MAWC have close communication for development and operation of new landfill site developed at lagoon side of Batkan.
- In Jul.2020, construction of new landfill site was commenced.
- In Jan 2021, cell no 1 of new landfill site was completed.
- In Mar.2021, Landfill operation at cell no 1 was commenced.
- In May 2022, cell no 1 is almost full and move to cell no 2 for landfilling
- At the same time, landfill extension work to the ocean side is under progress.

Country Achievements: RMI-Majuro

Landfill Improvement (Early Stage)



Landfill Improvement (Current Stage)



Country Achievements: RMI-Majuro

Komol Tata



JICA Japanese Technical Cooperation Project II for Promotion of Regional Initiative on SWM in Pacific Island Countries (JPRISM II)

The Fifth JCC Meeting:
Country Achievement

RMI - Ebeye

Country Achievement: RMI-Ebeye

Achievement specific to Ebeye

Output 3: Introduction of Container Deposit System (CDS)

The CDS is fully operational in Majuro, however buyback hasn't been started in Ebeye yet. KALGOV is trying hard to start operation of the redemption center.

Other Important Activity

- Coordination and Materialize improvement of SWM Projects by other funding sources is especially important in Ebeye.

Country Achievement: RMI-Ebeye

Introduction of Container Deposit Scheme

- Two press machines were procured by GEF/UNDP.
- KALGOV Staff (technical) were sent to Majuro to learn from MAWC
- KALGOV Staff (accountants) were sent to Majuro to learn from MAWC
- Redemption Center by KALGOV was started in June 2021 but due to breakdown of press machine, it was suspended.
- Currently, KALGOV is communicating with the Manufacturer to fix them



Country Achievement: RMI-Ebeye



Introduction of Container Deposit Scheme

- In order to resume operation of the redemption center,
 - Need to fix the press machines
 - Had contact with the manufacturer
 - Also, a bigger press machine is under procurement
 - Need to confirm whether the special fund has enough seed money
 - Held a meeting with KALGOV, EPA, MAWC and the Custom
 - Need to find a solution for the flow from the US base

Coordination with other support

- Urban Service Improvement Project by ADB
- Grant aid from Japan

Country Achievement: RMI-Ebeye



Country Achievements: RMI-Majuro



Japanese Technical Cooperation Project II for Promotion of Regional Initiative on SWM in Pacific Island Countries (JPRISM II)



Komol Tata



The Fifth JCC Meeting:
Country Achievement

FSM - National

Country Achievement: FSM-National



Activities specific to FSM National

Output 1: Provision of support to formulate SSWMS in each state

An SWM expert from SPREP was invited to the SWM workshop held on 27th Sep 2017 in Pohnpei. The expert extended her supports to all the counterpart officials from four states This workshop was co-organized and cost-shared by DECCEM and JPRISM II.

Output 2: Sharing knowledge and experiences

- SWM Workshops, co-organized and cost-shared by DECCEM and JPRISM II, were held in Pohnpei in 2017 and 2019.
- With an initiative of DECCEM Good Practices on SWM in FMS was compiled.



2

Country Achievement: FSM-National



Other Important Activity

Formulation of the National Waste Management Strategy

- Include both solid and hazardous wastes
- Series of discussion among DECCEM, SPREP and JPRISM2 through web meetings are on going.
- The draft is under preparation.
- Need to circulate the draft and consult with state representatives



The First SWM Workshop held in Sept. 2017



The Second SWM Workshop held in Sept. 2019

Country Achievement: FSM-National 

Activities specific to FSM National

Collaboration between JPRISM experts and FSM DECEM on the following:

- Technical advice on ELV management
- Technical advice on general waste management activities

Development of Good Practices highlighting J-PRISM activities and related waste management activities for the years 2020 to 2022



4

Country Achievement: FSM-National 

Kalahngan



5

 Japanese Technical Cooperation Project II for Promotion of Regional Initiative on SWM in Pacific Island Countries (JPRISM II) 

**The Fifth JCC Meeting:
Country Achievement**

FSM - Kosrae

Country Achievement: FSM-Kosrae 

Achievements specific to Kosrae

Output 3: Waste collection is improved in Kosrae.

Inter-Municipal Collection System (IMCS) is introduced in February 2020, and since then the system has been operated on schedule as planned and there are no other major issues.

Other Important Activity

- Improvement of the final landfill site

Country Achievement : FSM-Kosrae 

Inter-Municipal Collection System

Before IMCS

- Collection and transportation is a responsibility of municipalities.
- Municipalities with weak financial basis failed to provide regular collection services to residents.
- Through consultations and discussions among state agencies and municipalities, introduction of IMCS was decided.
- A new 4 ton-compactor truck was procured in a timely manner by the Non-project type grant aid of GOJ.



Country Achievement : FSM-Kosrae 

Inter-Municipal Collection System

After Introduction of IMCS

- Collection and transportation by DT&I
- Cost sharing between DT&I and four municipalities, and municipalities pay the cost of fuel for compactor truck based on population.
- Kerbside collection by a compactor truck with music.
- A series of community meetings to seek cooperation from residents
- Collection rate increased by 30%.



Country Achievement : FSM-Kosrae



Other Important Activity

Improvement of disposal site

- As a result of successful implementation of IMCS, the disposal volume is increasing.
- Improvement is underway for proper management of the disposal site.
- ✓ Construction of entrance & embankment



Country Achievement: FSM-Kosrae



Kulo Malulap



JICA Japanese Technical Cooperation Project II for Promotion of Regional Initiative on SWM in Pacific Island Countries (JPRISM II)



The Fifth JCC Meeting: Country Achievements

FSM - Pohnpei

Country Achievement: FSM-Pohnpei



Achievements specific to Pohnpei

Output 3: Improvement of Container Deposit System in Pohnpei

Being in the process of improvement. Press machine is going to be procured by the non-project type grant of GOJ and a new recycling shed is under construction by the grassroots grant aid of EOJ.

Other Important Activity

- Collection Improvement in Kolonia

Country Achievement: FSM-Pohnpei



Improvement of Container Deposit System in Pohnpei

[Background]

- Only cans are collected only several times per year.
- ➡ Need to add items and increase collection frequency.

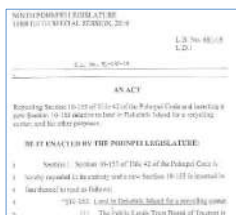
[Details of improvements and their progress]

New recycling center and a bigger press machine

- For a new and bigger recycling centre, EPA made efforts to legalize the land use of a piece of land of the current disposal site as a recycling center.
- EPA successfully applied for a grassroot grant aid to construct a new recycling centre and construction is completed.
- With the effort of EPA, a bigger press machine is under procurement by the non-project type grant aid of Japan

Activities needed (After procurement of the press machine)

- Amend the law to expand target items (PET, glass, batteries)
- Contract out the operation of the recycling center
- Awareness raising by EPA



Country Achievement : FSM-Pohnpei



Country Achievement: FSM-Pohnpei



Other Important Activity: Improving Waste Collection in Kolonia

[Background]



[Details of improvements and their progress]

- Study on locational information of existing containers (apprx. 350 locations)
- Establishing (a) collection routes and (b) weekly collection schedule, based on the result of the above study and actual driving test.
- Replacing the steel containers with 780 32-gallon garbage bins with wheels by JICA. Numbered bins are distributed to each subscribing households/ business entities.
- Annual cost is estimated as US\$31,000-, including fuel, vehicle maintenance, and labor cost.
- Garbage fee for household is \$5-/mth, \$20-/mth for business entities, to cover the cost.
- A leaflet was prepared and being distributed for proper disposal methods, collection schedule, unaccepted items to prevent damages to the compactor trucks. Same content is broadcasted on the radio to further reach the public.
- The new collection system will start as soon as a training on the new vehicles and above-mentioned preparations are completed.

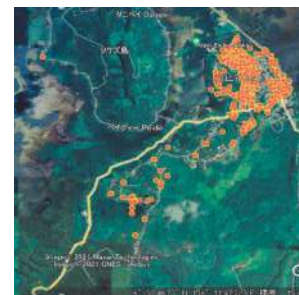
Country Achievement: FSM-Pohnpei



Pictures:



Garbage collection before the improvement. Approximately 350 steel containers are installed at Kolonia Town. The containers with full of garbage are loaded onto a flatbed truck with a crane, and the garbage is discharged at the disposal site.

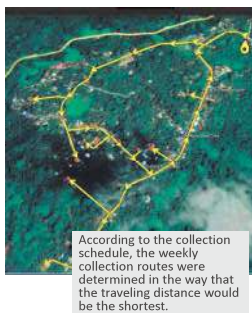


Location of existing containers (about 350 locations) was surveyed by GPS.

Country Achievement: FSM-Pohnpei



Pictures:



According to the collection schedule, the weekly collection routes were determined in the way that the traveling distance would be the shortest.

A flyer was developed and distributed to raise awareness of the residents and business entities.



32-gallon Trash-bin with wheels and a lid. Approximately 780 garbage bins are procured under JICA assistant. The bins are numbered and linked to a client list.



2 4-ton compactor trucks under Grass-root Grant Aid will serve as an indispensable part of the new collection & transportation system.

Country Achievement: FSM-Pohnpei



Kalahngan



JICA Japanese Technical Cooperation Project II for Promotion of Regional Initiative on SWM in Pacific Island Countries (JPRISM II)



The Fifth JCC Meeting: Country Achievement

FSM - Chuuk

Country Achievement: FSM-Chuuk



Achievement specific to Chuuk

Output 3: Introduction of Container Deposit System (CDS) in Chuuk

With initiatives of Chuuk EPA, two press machines were successfully procured by the grassroots grant aid of EOJ. Also, with support from J-PRISM expert, the CDL law (amendment) was ready to present at the legislative assembly.

Other Important Activity

- Landfill improvement
- Support to a remote island

Country Progress: FSM-Chuuk



Introduction of CDS

The next steps to be followed are:

- To amend the CDS law.
The amendment is ready and thus, EPA has to be called to the state legislative assembly, and explain the needs of CDS and the essence of the amendment, at the assembly.
- Need to prepare for the seed money
 - For both, political momentum and decision are needed.



3

Country Progress: FSM-Chuuk



Landfill improvement

- Interim marina dumpsite is over-used.
- Mid-term solution is to re-use the dump site previously used in Neuo. Currently the rehabilitation work is ongoing



Interim Marina Dumpsite as of May 2021



Neuo dumpsite that needs rehabilitation. 4

Country Progress: FSM-Chuuk



Support to a remote island

- Request to Chuuk EPA from a remote island called the Oneisom Island, on formulating Solid Waste Management Plan (SWMP)
- A EPA Officer conducted waste audit in the Oneisom Island
- Based on the result of waste audit, as well as through a series of discussion among the Executive Officer of the Oneisom Island, EPA and J-PRISM experts, the first draft of SWMP for Oneisom Island is under preparation.
 - EPA will become able to support other remote islands in the future.



Dumpsite in the Oneisom island as of April 2022

Country Achievement: FSM-Chuuk



Kinisou Chapur



6



Japanese Technical Cooperation Project II for Promotion of Regional Initiative on SWM in Pacific Island Countries (JPRISM II)



The Fifth JCC Meeting: Country Achievement

FSM - Yap

Country Achievement : FSM-Yap



Achievements specific to Yap

Output 3: Waste collection is improved in Yap island.

Budget constrain barely permitted to sustain current Colonia collection & landfill management. Also, plans for island-wide collection, using a 4-ton compactor truck acquired through the grassroots, have halted.

Other Important Activities

- Improvement of disposal site
- Continuous data management of disposal site
- Continuous operation of Container Deposit System (CDS)

Country Achievement : FSM-Yap



Other Important Activity (1)

Final disposal improvements were implemented to extend the life of the disposal site.

- Vertically extended the landfill gas venting pipes
- Access road raised and expanded the disposal capacity



Vertically extended landfill gas venting pipes



Raised the access road and expanded the disposal capacity

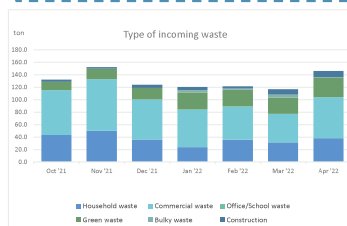


Country Achievement : FSM-Yap

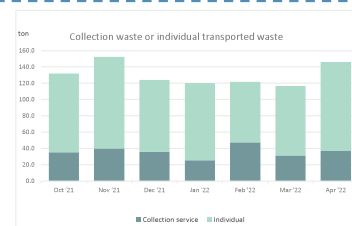


Other Important Activity (2)

Continuous recording of incoming data to disposal site and planned management of disposal site based on these records.



Incoming waste to the disposal site is 4 to 5 ton per day. Commercial waste is dominant in the disposed waste.



Waste directly brought-in accounts for a high percentage in the total disposal amount.

Country Achievement : FSM-Yap



Other Important Activity(3)

Since the start in 2009, the Container Deposit Scheme is being operated by the private system operator and well monitored by the EPA continuously. CDS in Yap is well institutionalized and being operated steady and continuously.



	Aluminum			PET			Glass		
	Deposit	Refund	%	Deposit	Refund	%	Deposit	Refund	%
2018	2,592,859	2,422,288	93.42	680,172	323,478	47.56	43,781	7,813	17.85
2019	2,349,623	2,471,148	105.17	694,283	306,952	44.21	36,536	4,170	11.41
2020	2,098,881	2,708,277	129.03	833,192	406,397	48.78	48,455	5,471	11.29
2021	2,477,432	3,437,475	138.75	874,502	489,605	55.99	100,509	6,487	6.45

Country Achievement : FSM-Yap



Kammagar



JICA Japanese Technical Cooperation Project II for Promotion of Regional Initiative on SWM in Pacific Island Countries (JPRISM II)



The Fifth JCC Meeting: Country Achievement

Palau

Country Achievement: Palau



Achievements specific to Palau

Output 3: Improvement of waste collection in Babeldaob and Koror

Inter-state collection services in Babeldaob by the private contractor commissioned by BPW started on 22nd February 2021.

Since then, one year passed and operation was smoothly conducted. Re-new collection contract in January 2022.

Output 4: Appropriate transition from M-Dock to the new landfill site

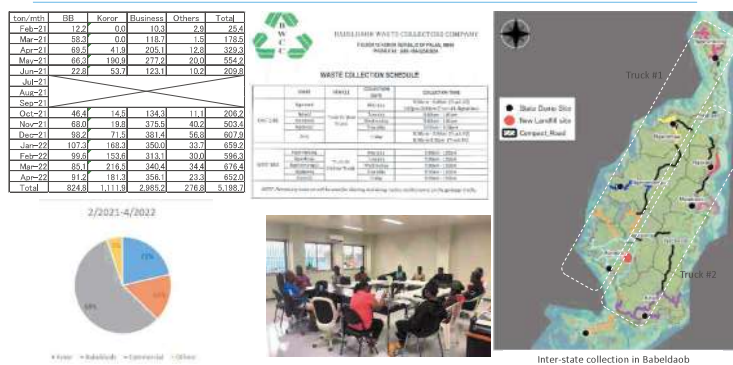
Operation of the new landfill site in Aimeliik (NLS) started on 22nd February, 2021.

Transition from M-Dock to the NLS was conducted smoothly without any complain from waste generators and transporters.

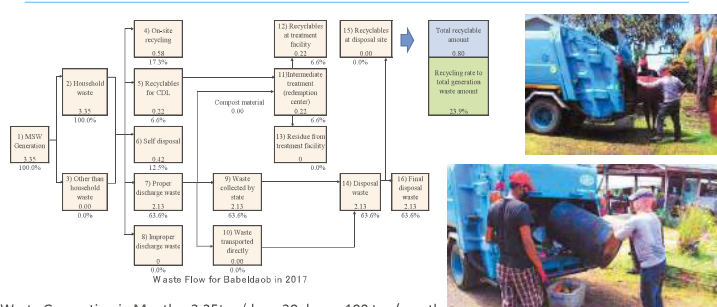
Landfill operation was carried out according to the filling procedures and first soil cover was applied in a small section late last year.

Incoming waste amount was recorded daily through weighbridge to monitor waste collection activities and will be utilized for deciding future tipping fees

Inter-state collection Services in Babeldaob



Waste Flow in Babeldaob



Waste Generation in Month = 3.35ton/day x 30 days = 100 ton/month
 All the generated wastes in BB are collected and transported to NLS in Aimeelik!

Operation of the new landfill site & Proper closure of the disposal site

- Daily operation of the new landfill site is going well so far.
- Further discussion for tipping fees from businesses and other issues is needed, based on the analyzed data of weigh-bridge.
- Proper closure plan of the state disposal sites in Babeldaob are needed to be discussed.

Aerial photo of National Landfill Site

Completion Ceremony in Nov 2020
 Landfill Operation started in Feb, 2021



As of May 2021 (Just after start operation)



As of Dec 2020 (Just before start Operation)

Aerial photo of National Landfill Site



As of August 2021

Aerial photo of National Landfill Site



As of June 2022

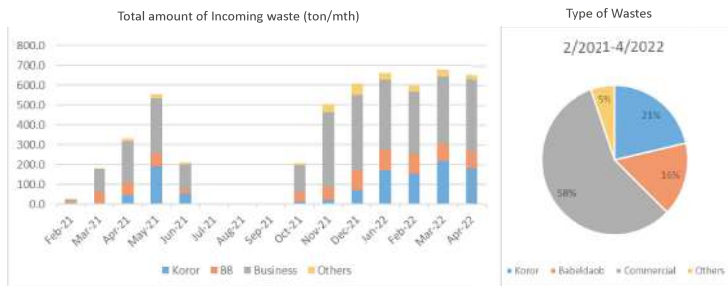
Weigh Bridge Record at National Landfill Site



- Commencement of Operation in 22nd Feb 2021
- Breakdown due to blackout happened in 11th Jun 2021 until 17 Oct 2021.
- Operation resumed in 18 Oct 2021 until now.

ton/mth	BB	Koror	Business	Others	Total	Operation days	daily ave.
Feb-21	12.2	0.0	10.3	2.9	25.4	6	4.2
Mar-21	58.3	0.0	118.7	1.5	178.5	31	5.8
Apr-21	69.5	41.9	205.1	12.8	329.3	29	11.4
May-21	66.3	190.9	277.2	20.0	554.2	31	17.9
Jun-21	22.8	53.7	123.1	10.2	209.8	10	21.0
Jul-21							
Aug-21							
Sep-21							
Oct-21	46.4	14.5	134.3	11.1	206.2	14	14.7
Nov-21	68.0	19.8	375.5	40.2	503.4	29	17.4
Dec-21	98.2	71.5	381.4	56.8	607.9	30	20.3
Jan-22	107.3	168.3	350.0	33.7	659.2	31	21.3
Feb-22	99.6	153.6	313.1	30.0	596.3	28	21.3
Mar-22	85.1	216.5	340.4	34.4	676.4	31	21.8
Apr-22	91.2	181.3	356.1	23.3	652.0	30	21.7

Analysis of the Weigh Bridge Data at National Landfill



Other Important Activity: Palau



Public Awareness Activities



Other Important Activity : Palau



Pictures: Further advancement of recycling activities



Other Important Activity : Palau



Commencement of JICA's Grassroots Grant Project (Business Development Track Project for Belau ECO Glass)

- 3 year Technical Assistance Project to develop business model and enhance local staff capacity in various glass crafting techniques
- 2 Experts from Sanda City Glass Craft Center dispatched in March (pictured below: Ms. Keiko Setoguchi and Mr. Koichi Watanabe)
- Planning and development of ECO tour operations for tourists and glass product sales scheme and promotion
- July 2022: All Belau Eco Glass staff (8) will be sent to Japan for training and experiencing first-hand full scale operations of Glass Studios in Japan



Country Achievements: Palau



Sulang



Japanese Technical Cooperation Project for Promotion of Regional Initiative on Solid Waste Management in Pacific Island Countries (JPRISM II)

MIMURA Satoru
Chief Advisor, JPRISM II
mimura.jprism@gmail.com



Regional Activities (Output & Progress)



		Achievement level
OUTPUT1	Monitoring mechanism for solid waste management in line with Cleaner Pacific 2025 is strengthened.	-1 st Monitoring was conducted Feb 2020. -Submitted from Palau, FSM and Samoa -Report of the 1st Monitoring was published. https://www.sprep.org/j-prism-2/regional-monitoring
OUTPUT2	Regional cooperation within the Pacific is organized and promoted by utilizing regional human resource and sharing lessons learnt in the region.	-36 Trainings have been implemented including "Trainings on Proper Preventive Maintenance of Garbage Collection Vehicle and Heavy Machinery" for Micronesia region. -"Toolkit for Maintenance of Vehicles and Heavy Machinery" is available at J-PRISM II/SPREP website -"CDS guidebook" and "Lessons learnt" are now available at J-PRISM II/SPREP website -Regional human resource database "PIDOC" was transplanted to SPREP intranet.



Regional Activities (Output & Progress)



		Achievement level
OUTPUT3	Regional capacity of disaster waste management is strengthened.	-Regional Disaster Waste Management Guideline was published. -DWM Contingency plan for Vanuatu and Samoa have been drafted. -Support for Tonga volcano disaster recovery
OUTPUT4	Practical and sustainable 3R+Return system is enhanced.	-Recycle associations have been established in 3 countries -SRMWA (Samoa Recycling & Waste Management Association) Pilot Project has been going on.



SRWMA/JPRISM Pilot Project Updates



Project Period : July 2021 – November 2022

Purpose

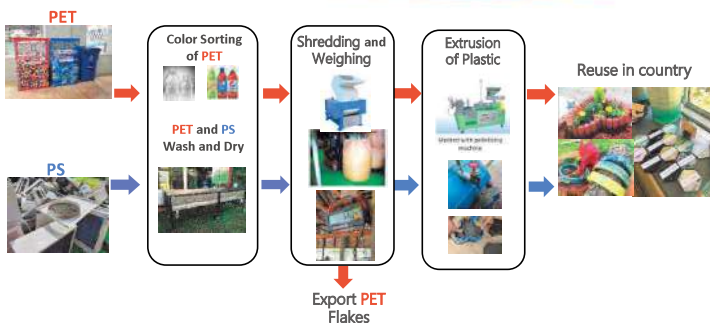
- Strengthen recycling capacity in Samoa
- Examine economic and environmentally friendly waste treatment methods
- Develop practical and sustainable 3R+Return system

Activities

- Plastic (PET and PS) recycling
- Waste Oil Collection



1. Plastic Recycle Pilot Project



2. Waste Oil Collection



1st Phase Waste Oil PP has been completed in Sep 2021

Total Collection Volume: 40,964 liter (211 Drums+ 21 Small containers)



The final Steering Committee
will be held on 13 and 14 September, 2022.

Thank you.



ANNEX F Good Practices



KEY WORDS

3R + Return,
CDL, Remote Islands

Type of Document

a good practice fact
sheet

Target Audience

Officials of PICs
Donors

Publication Date

August 2020



The Extended CDL Network in Palau – an enabler of recycling activities in the remote island, Peleliu



Republic of Palau

Peleliu Island

Application of CDL to a remote island in Palau, Peleliu

Improving the SWM situation in remote islands is a big challenge for PICs. In fact, many PICs have failed to take effective measures towards remote islands, as usually the focus of the national government is skewed towards the populous major islands, while donor interventions tend to be concentrated in populous areas as well by considering the cost effectiveness of such interventions.

In July 2016, the CDL system of Palau was introduced to the remote Peleliu island, located southwest of the main islands of Palau. This was an innovative initiative by a Japan Overseas Cooperation Volunteer (JOCV) who was dispatched to the Peleliu State Government at that time. The JOCV devised a beverage container recovery system that was workable in this remote island through discussion and collaboration with the redemption centre of the Koror State Government.

Leading Agency(s)

Peleliu State Government, SWM section of Koror State Government, Japan Overseas Cooperation Volunteers (JOCV)

Location/ Geographical Coverage

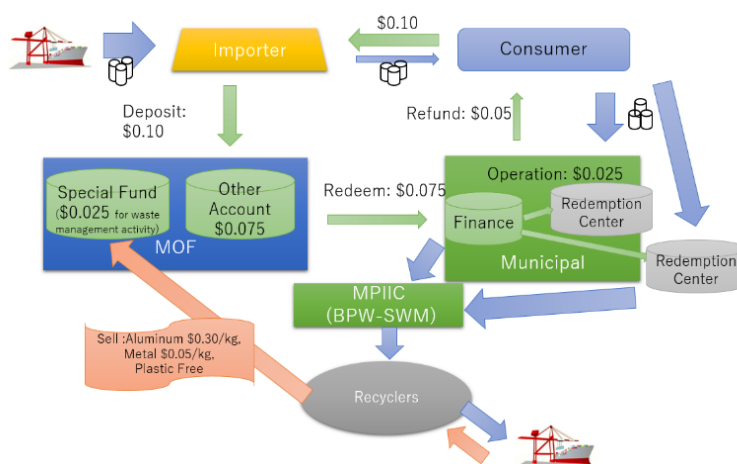


Measures/ Approach

Despite the growing interests towards 3Rs in PICs, many PICs struggle to implement substantial 3R activities which are beyond simply being environmental campaigning. This situation is particularly noticeable in remote islands.

Among such 3R challenges, beverage container recycling, often called CDL, can be made to work well in the Micronesia region. . The CDL system in Palau is shown in the diagram below. The application of the existing CDL system functioning in the main islands of Palau so that it can also operate in the remote island of Peleliu is the essence of this good practice study.

(1) How CDL works in Koror (the main island)



- Deposit fees, 10 cents per container, are imposed on imported beverage containers when imported.
- Consumer who bring empty containers to the designated redemption centers will receive 5 cents per container.
- Half of the remaining 5 cent deposit originally paid, 2.5 cents, is paid to the redemption centre in order to cover the operation costs, as Handling Fee.
- The other half, 2.5 cents, is held back in the special fund of the Ministry of Finance (MOF) to be used by the Bureau of Public Works (BPW) for solid waste activities such as landfill improvements.

(2) How CDL works in Peleliu (a remote island)

- Every consumer or resident who brings empty beverage containers to the Peleliu State Government (PSG) will receive 2.5 cents per container.
- PSG will ship out the collected containers to Koror via public boats, and a PSG official who receives the containers at the port in Koror will bring them to the redemption centre in Koror, and will receive 5 cents per

container.

- The difference, 2.5 cents per container will go to the PSG in order to cover the operation cost of PSG.
- As a recent phenomenon, a Bangladesh worker who works at the construction site in Peleliu started buying empty containers at the higher rate (higher than 2.5 cents per container) and bring them to the redemption centre in Koror to get 5 cents. The difference is his income. Most of the empty containers are now bought up by this Bangladesh worker since he pays more than 2.5 cents, however, currently PSG does not have any intentions to oppose this situation.
- **Residents** of the Peleliu Island are beneficiaries.
- **Residents** are the beneficiaries of this good practice (the CDL system) which was introduced by **the Peleliu State Government**.
- This CDL system improvement was implemented by **the Peleliu State Government**, in collaboration with the redemption centre of **the Koror State Government**.
- Important external factors are (i) the involvement of **a JOCV** dispatched to the Peleliu State Government and (ii) the **CDL system** fully functioning in the main island of Palau.
- As a recent phenomenon, in place of the Peleliu State Government, a **private buyer**, a Bangladesh worker, buys beverage containers from residents.

Stakeholders/ Actors

Results/ Outputs

Empty beverage containers that had been disposed in the state dump site or scattered all over the island are now collected and shipped out from Peleliu to the redemption center in Koror.

Impact

CDL in the remote island of Peleliu is realized as having a positive impact, just as has the CDL system in the main islands of Palau. This extended CDL network – the difference between (i) full-scale CDL in the main island and (ii) a modified CDL for a remote island provides residents of the remote island with the means of recycling their beverage containers.

As a result, the most of beverage containers are no longer dumped at the public disposal site. Also, the system contributes to reduction of waste beverage containers littered around the island.

A feature common to every CDL systems in the region is to benefit the less privileged more financially. Usually, those who are underprivileged will go around to collect empty containers and bring them to the redemption

centres to get the refunds.

Success Factors

The most important success factor, being a prerequisite, is the full-scale CDL in the main island.

Other important success factors in this good practise case are as follows: (i) A JOCV dispatched to the PSG, who knows how the CDL system functions in Koror, got interested in the introduction of CDL system in Peleliu, and actually encouraged the PSG to start the CDL; (ii) A Japanese SWM consultant hired by the Koror State Government, who supports the operations of the redemption centre, provided technical advice to the JOCV in a timely manner.

However, this does not mean the initial intervention by foreign experts is essential. Rather, this good practice proves that as long as the full-scale CDL functions in the main island, the application to the CDL to a remote island is possible by local officials, as is seen here.

Constraints

There is no serious constraints so, as long as the PSG considers collection of the target items by the private sector Bangladeshi collector no problem.

Sustainability

As long as the CDL system in the main island is institutionally, socially, economically and environmentally sustainable, which is usually so in most states and countries that have introduced the CDL system, the modified CDL in remote islands will also be institutionally, socially, economically and environmentally sustainable. The CDL records of PSG prove that the system is institutionally, socially, economically and environmentally sustainability although the JOCV has now left the island. Currently, no foreign volunteers or experts reside in Peleliu.

Replicability and/or Up-scaling

This is possible to be replicated in other remote islands if the full-scale CDL is introduced and functioning well in the main islands. The essence of how the extended CDL network works both in the main island and remote islands can be shared not only within the country but also among other PICs.

Lessons Learnt

There is still an opportunity to carry out 3R + Return activities even if islands are remote and small.

In case of Peleliu Island, the population size of 484 is rather too small to have own recycling system in a cost effective way, and therefore no recycling activities had been carried out for long time As a result, even valuable

aluminum cans were piled up in the state dump site. This practice shows that the introduction of a CDL system **in main islands** provides residents of less populous remote islands with rare opportunities for recycling in the most cost effective way.

Conclusion

This example illustrates the potential of CDL systems beyond expectations

The extended CDL network – the network between (i) full-scale CDL in the main island and (ii) modified CDL for a remote islands, is a very effective way to provide the residents of remote islands with opportunities of recycling with on the premises that the CDL functions well in the main island. This can be considered as an advantages or a positive impact of the CDL system in general.



Contributions to SDGs

This highly contributes to the **Target 12.5** *By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse of the Goal 12 Responsible consumption and production.*

Author(s) / Contact Details

J-PRISM II: Ms. Misa OISHI (oishimisa@gmail.com)

Peleliu State Government: Ms. Michelle Kodep (Maintenance worker/ Recycle Project, PSG) ;Ms. Shari Nicholas (State Finance Officer/ Chief of Staff, PSG)

Relevant Websites/ Resources

None

Publisher

J-PRISM: The Project for Promotion of Regional Initiative Solid Waste Management, JICA: Japan International Cooperation Agency

Acknowledgments

SPREP: Secretariat of the Pacific Regional Environmental Programme



KEY WORDS

SWM Information, Policy formulation, informed decision making, Baseline survey, WACS

Target Audience

Officials of PICs
Donors

Publication Date

August 2020



Formulation of State Solid Waste Management Strategy and Action Plan based on waste flow analysis



Federated States of Micronesia

Yap, Chuuk, Pohnpei, Kosrae

How SSWMSs are successfully formulated

J-PRISM II has been supporting four states of FSM to formulate state solid waste management strategies (SSWMSs) as an important outcome of the project. Supports for strategy formulation were provided by its predecessor J-PRISM I, as well as other donors, but the support of J-PRISM II is significantly different from the previous support in emphasizing the importance of understanding the current SWM situations technically as well as quantitatively, through a baseline survey in order to set strategic goals and actions. The formulation of SSWMSs is carried out according to the following two-step approach.

Step 1: Understanding the current SWM situation technically as well as quantitatively

Officers-in-Charge in each of the four states, and J-PRISM II experts, jointly conducted a series of SWM baseline surveys in each state, including waste amount and composition survey (WACS), incoming waste amount survey at landfill sites, time and motion survey, public opinion survey, etc., in 2017, the first year of J-PRISM II. After that, the SWM situation was summarized so that the Waste Flows were understood technically as well as quantitatively. Finally, the more urgent SWM issues and challenges in each state were identified and shared amongst key stakeholders.

Step 2: Formulating strategies to tackle SWM issues and challenges identified

Based on the common understanding and perception of these waste issues and challenges, the key stakeholders formulated a SSWMS for each state. These SSWMS list several priority activities that each state should undertake. Among the priority activities, the ones each state should tackle urgently were chosen as project outputs of J-PRISM II, and the local counterparts in each state are currently involved in the effort to improve the situation with assistance from J-PRISM II experts. (Note: PDF files of all SSWMSs are available on the SPREP Web site. <https://www.sprep.org/j-prism-2/report-and-materials>)

Leading Agency(s)

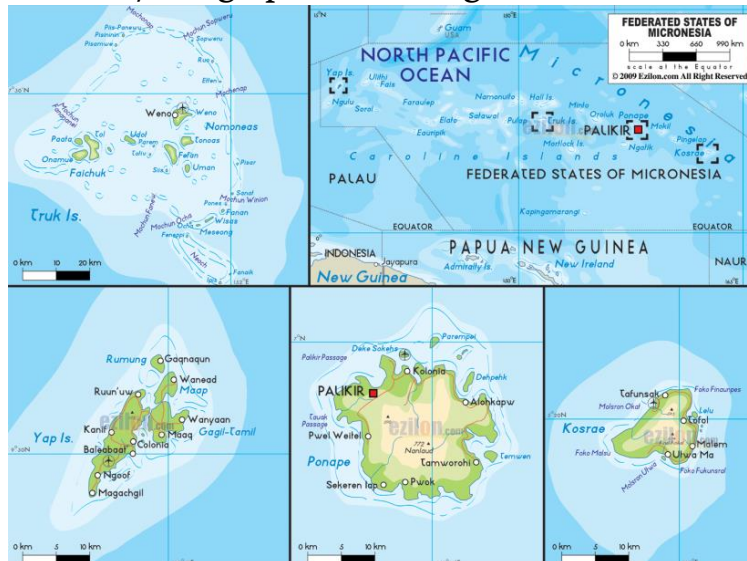
Yap: DPW&T, Yap EPA, Island Paradise Company

Chuuk: Chuuk EPA, DT&PW

Pohnpei: Pohnpei EPA, T&I, Pohnpei Waste Management Service

Kosrae: KIRMA, DT&I, Micronesia Eco Inc.

Location/ Geographical Coverage



Measures/ Approach

Step 1: Understanding the current SWM situation technically as well as quantitatively

A series of baseline surveys were carried out in order to develop waste flows in each state. A concept of the waste flow consisting of generation, discharge, collection, dispose and recycling is shown in the Figure 1. The following are a series of SWM baseline surveys which are essential to create a waste flow.

- A. Waste Amount and Composition Survey (WACS)
- B. Public Opinion Survey on waste discharge manner (POS)
- C. Population data of both collection and non-collection areas
- D. Recycling survey, especially data on container deposit recycling
- E. Incoming waste amount surveys at landfill sites

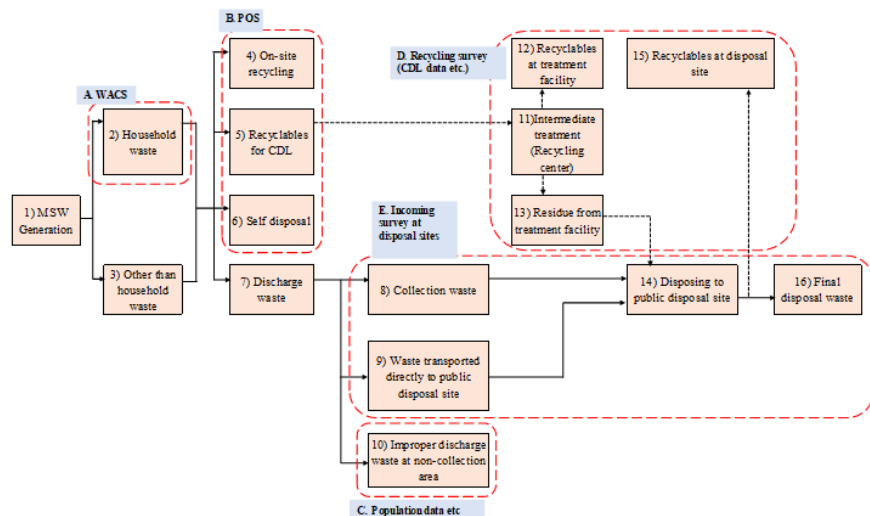


Figure1: Conceptual waste flow and necessary baseline surveys

Waste Amount Composition Survey (WACS)

Generated waste amount per person per day, and its composition, were determined by WACS which were conducted either during J-PRISM I or J-PIRMS II. As an example, findings of WACS implemented in Pohnpei under J-PRISM II in 2017 are shown below:



- Discharged household waste amount per person per day and its composition was surveyed. The number of sampled households was 20 in total. Ten samples were selected from Kolonia Town

State	Generation amount of state solid waste g/person/day (lb/day)	Generation amount of Household waste g/person/day (lb/day)
Pohnpei	1,147(2,529)	743(1,638)
Chuuk	916(2,020)	582(1,283)
Kosrae	1,128(2,487)	772(1,702)
Yap	1,292(2,849)	834(1,839)

Government and ten from Kitti Municipal Government. Kitchen waste and the other waste were requested to be discharged separately in order to carry out composition survey. The survey team collected wastes from sample households every day for a week consecutively. The result of the survey showed that the discharged amount of household waste was in total 356 g/person/day; 75g/person/day for kitchen waste and 281g/person/day for the other waste.

- By weight, kitchen waste accounts for 30% of the discharged waste from a typical household. Considering that kitchen waste is recycled in many household as a feed of livestock, the percentage of kitchen waste in the household waste generation is high. Plastics - including PET bottles - account for 16 % by weight, with the next highest component by weight being diapers at 10 %, an indication of the numbers of young children per household.

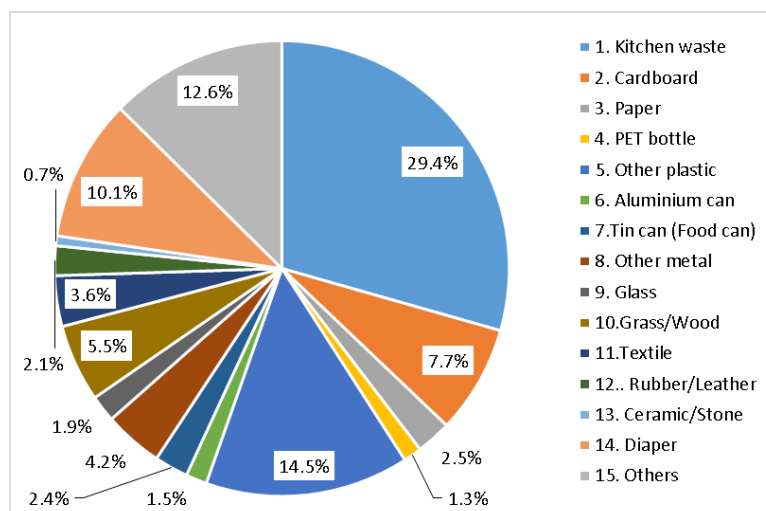


Figure2: Composition of household waste in Pohnpei

Incoming waste amount survey at landfill sites

To find out the final disposal amount, all incoming vehicles which transport waste to a disposal site were surveyed each day for a week. Waste is estimated by volume and then converted to weight. Survey items are (i) type of vehicle, (ii) type of container on the vehicle, (iii) type of collection (public collection, direct haulage by households or business) and (iv) type of waste (household, commercial, green, bulky, etc.) The results are shown in Figure 3. The average amount of incoming waste at Pohnpei landfill site is 22.9 tons per day, while the average number of incoming vehicles is 140 per day. Of the disposed amount, 54.2% is transported directly by residents, stores and other such sources, 26.6% is collected by local governments and 19.2% is collected by the private business operator, Pohnpei Waste Management Service. The rate of household waste disposed at the landfill site was around 30% and other waste such as commercial waste and public waste was around 70%.

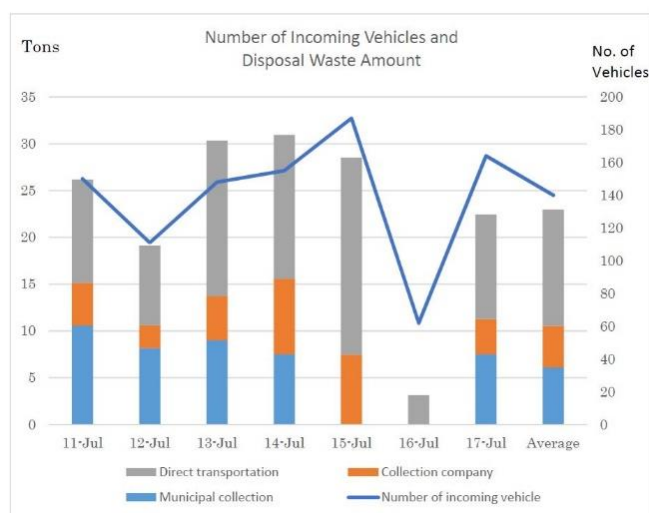
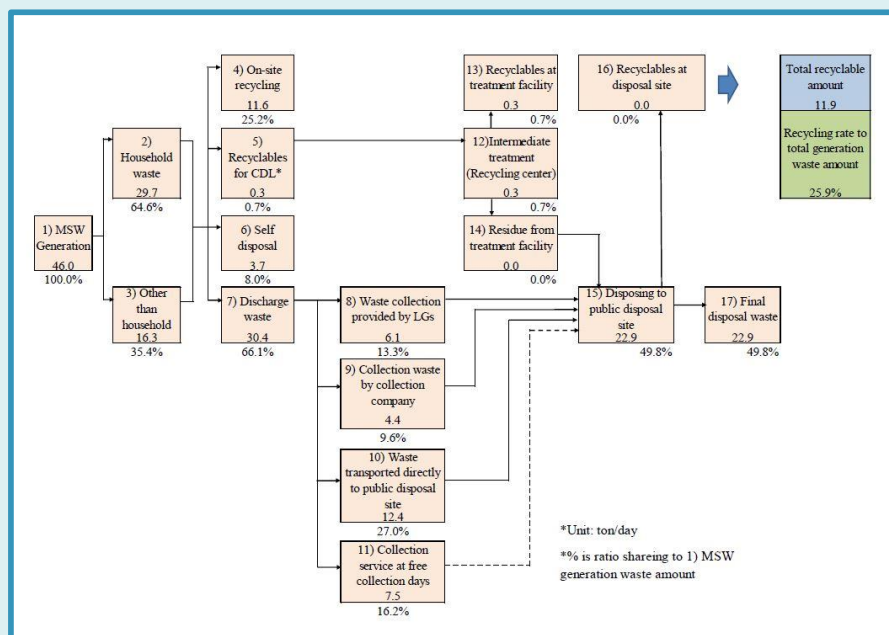


Figure3: A result of incoming survey

How to read Waste Flows - Example of Pohnpei

1. 46.0 tons of waste is generated daily on the main island of Pohnpei.
2. 29.7 tons of that 46.0 tons are generated from households.
3. 16.3 tons of that 46.0 tons are generated from non-households such as businesses, shops, schools, etc.
4. Of the total of 46.0 tons generated, 11.6 tons are not discharged but reused or recycled as feed to animals and/or used as fire wood.

5. Of the 46.0 tons generated, 0.3 tons are not discharged but recycled under the container deposit legislation program.
6. Of the 46.0 tons generated, 3.7 tons are not discharged but disposed within the premises of the people who generated that waste.
7. Of the 46.0 tons of waste generated, 30.4 tons are discharged.
8. Of the 30.4 tons discharged, only 6.1 tons are collected by the public collection services.
9. Of the 30.4 tons discharged, 4.4 tons are collected by the private collection company.
10. Of the 30.4 tons discharged, 12.4 tons are directly transported to the final disposal site by residents themselves.
11. Of the 30.4 tons discharged, 7.5 tons are collected and disposed at clean-up days held several time in a years.
12. Finally, only 22.9 tons (6.1+ 4.4 plus + 12.4 tons) are disposed at the public disposal site every day.



Step 2: Formulating strategies to tackle SWM issues and challenges identified

A series of consultation meetings were held to disseminate the result of the SWM baseline survey, as well as to help the participants to have a common understanding and perception of the waste issues and challenges in each state. Key stakeholders could then contribute to formulate SSWMS for each state. These SSWMS have now been formally endorsed by the governor of the respective state.



SSWMS in each state



Stakeholders/ Actors

SSWMS include the entire waste system, namely collection, disposal, recycling and environmental awareness; identify urgent SWM issues, and set out future directions. Key stakeholders for collection, disposal, recycling and environmental awareness are shown in the next table.

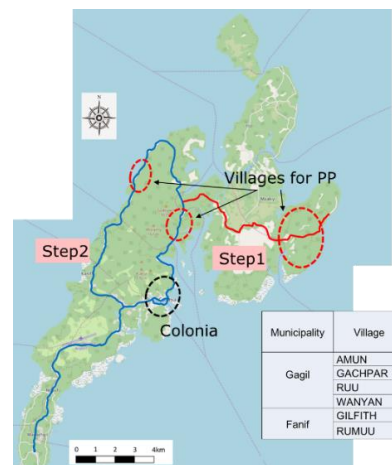
	Collection	Disposal	Recycling	Awareness
Yap	Private Companies	Private Company supervised by DPW & T	Private Operator supervised by Yap EPA	Yap EPA
Chuuk	DTPW	DTPW	Not yet in place	Chuuk EPA
Pohnpei	Town/ Municipal Governments	Private (Pohnpei Waste Management Service) contracted with T&I	EPA/ Kolonia Town Government/ Madolenihmw Municipal Government	Pohnpei EPA
Kosrae	DT & I	DT & I	Private Operator supervised by KIRMA	KIRMA

Results/ Outputs

As noted above the completed SSWMS have been officially approved by the Governors of each state. Now some key strategic actions detailed in the SSWMS are being implemented. Examples of such actions are introduced below.

YAP: Pilot Project to expand the public collection service

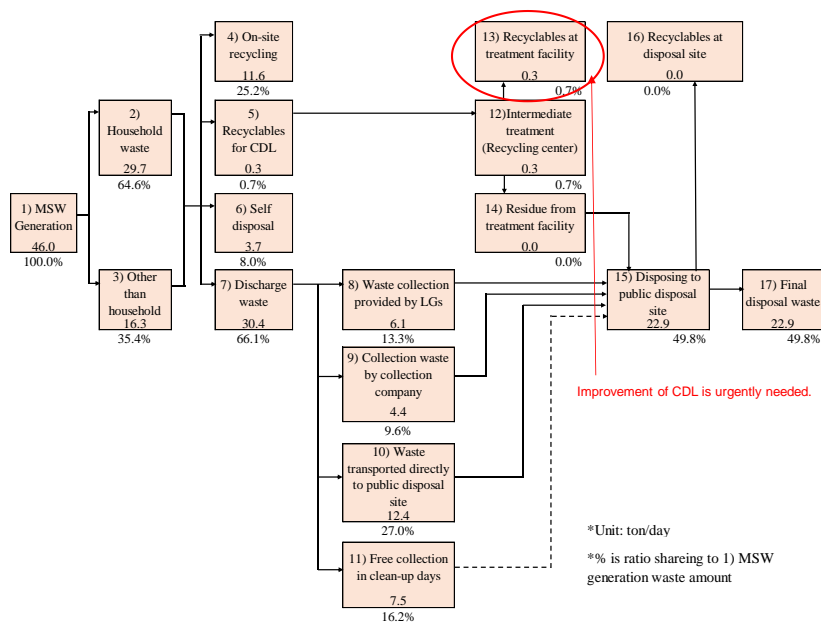
As understood by the Waste Flow of Yap, the expansion of waste collection coverage is the biggest challenge in Yap. The Department of Public Works and Transportation, Yap EPA, and J-PRSIM experts gathered together and decided to tackle this issue by implementing a pilot project. As a first step, the collection of the northeastern part of the main island where waste collection is most needed was



targeted. In this area, a collection station method, as well as a fee collection system, is being tested to see if this is workable for Yap.

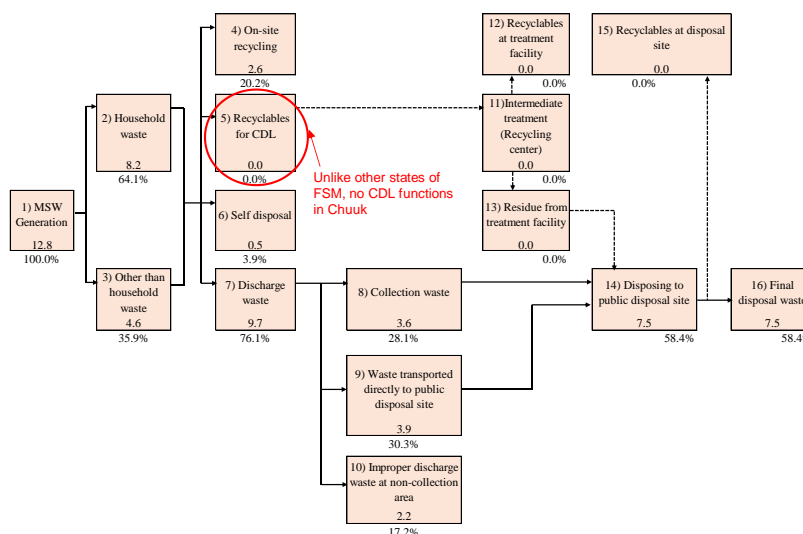
POHNPEI: Improvement of Container Deposit System (CDS)

As seen in the Waste Flow, only 0.3 tons of beverage containers are handled under the CDS in Pohnpei, since only aluminum cans are collected several times a year under the current state recycling program of Pohnpei. However, in Yap and Kosrae where CDS functions very regularly, not only aluminum cans but also PET and glass bottles are collected. Key stakeholders in Pohnpei, in particular Pohnpei EPA, demonstrated a commitment to improving the system. EPA applied for the grassroots grant aid from Japan to construct a new and bigger recycling center, which was awarded in late February 2020. Also, a newer and bigger press machine, similar to that which is currently in use in Majuro are under procurement by the Non-Project Grant Aid of Japan.



CHUUK: Re-introduction of CDS

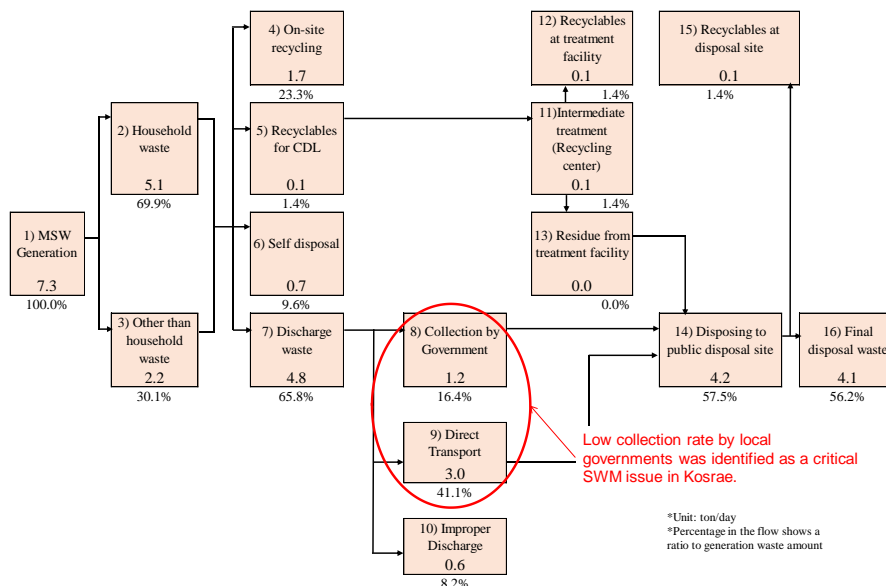
Chuuk has a history of being the first state to adopt a CDS recycling law among the four states of FSM. However it is currently the only state that does not have any recycling activities in the FSM. In order to inaugurate a CDS once again, key stakeholders in Chuuk, especially Chuuk EPA, took the first step to procure press machines by utilizing the Japan's grant assistance for grassroots projects.



Unlike other states of FSM, no CDL functions in Chuuk

KOSRAE: Introduction of Inter-Municipal Collection System (IMCS)

Through analysis of the SWM situations of Kosrae technically as well as quantitatively, Department of Transportation and Infrastructure (DT&I), Kosrae Island Resource Management Authority (KIRMA), and J-PRISM II experts reached a common conclusion that collection system improvement is the most urgent issue to be tackled in the state.



Low collection rate by local governments was identified as a critical SWM issue in Kosrae.

*Unit: ton/day
*Percentage in the flow shows a ratio to generation waste amount

<Before IMCS>

In Kosrae, where four municipalities are mandated to provide collection services to the residents, those municipalities with weaker finances had been struggling to provide regular collection services to the residents. The picture shows the notice board installed by KIMRA to notify people not to dump in open spaces. Illegal

heaps of wastes had been observed especially in the municipalities with no regular waste collection services. These illegal dumps have been removed, through the efforts of KIRMA, in collaboration with DT&I. However, this picture clearly shows the negative impact of a lack of regular collections in some areas.

<Introduction of IMCS>

Two factors became clear in time: I) procurement of a new 4-ton compactor truck by the Non-Project Grand Aid of Japan was a great advantage, and II) only 18 tons of waste per week are discharged from all four municipalities. Using the new compactor truck, all of the waste generated across the entire island can be collected and transported to the public disposal site, and so therefore the J-PRISM II experts recommended to key stakeholders to consider the introduction of IMCS where all municipalities used a single collection system. The key stakeholders, such as mayors, DT&I, KIRMA, and the Governor's Office, conducted a series of discussions and decided to introduce the IMCS.



<Features of IMCS>

In order to introduce an IMCS three issues needed to be clarified: (I) who operates the IMCS, (II) how to finance IMCS, and (III) which collection system shall be employed. Firstly, for (I) key stakeholders agreed that DT&I should be the operating agency. In other words DT&I, instead of the municipalities, would provide a waste collection services to all residents of the island. This became possible by amending the state code which defines the roles and responsibilities of DT&I. Now the provision of waste collection is formally defined as a responsibility of DT&I. Next, (II) In order to financially sustain the IMCS, US\$16,000 is required annually. US\$10,000 will be borne by the regular budget of DT&I. The remaining amount, US\$6,000, will be paid by each municipality in proportion to their population size. Finally, (III) Curb-side collection is employed in most areas, since most people live along the main roads in Kosrae. The collection truck has a sound system which plays music on the collection days. People bring their wheelie bins to the road side when the music approaches. IMCS has now started after a series of community meetings and awareness raising activities.

Success Factors

In order to formulate the SSWMS, a current waste flow analysis in each state was created based on various baseline surveys to quantitatively grasp the current status and issues of waste management. This deepened the understandings of the key stakeholders and made it possible to take concrete strategic measures,

especially for short-term priority issues.

Constraints

The initiative and ownership of a lead agency is essential. However, it is often difficult for a lead agency to do this when they are usually very busy with tackling the mounting daily tasks of waste management; to find time to sit, discuss and formulate plans and strategies. Also, the waste flow analysis needs some technical knowledge and experience to be done. Thus assistance with planning and strategy formulation using external support, as provided by J-PRISM II, can be a great advantage to State Government agencies.

Sustainability

The SSWMS covers a period of ten years. In every SSWMS, key strategic actions were identified with the estimated costs and the responsible organizations. The SSWMSs are formulated by paying special attentions to financial sustainability, organizational sustainability and technical sustainability.

Replicability and/or Up-scaling

Understanding the current SWM situation technically as well as quantitatively through a waste flow analysis is the distinguished feature of this process, but it is this very feature that requires technical intervention and support in the planning and development phases.

Revision of these SSWMS can be more easily done without technical intervention or support, if and only if the officials who formulated the first strategy together with J-PRISM II experts are still in the same position.

Lessons Learnt and Conclusion

Formulation of a waste management strategy based on waste flow analysis is proven to be an effective way to propose sustainable improvement plans.

As the current state of waste management can be best grasped by waste flow analysis quantitatively as well as technically, so stakeholders become able to deepen their understanding of the SWM problems faced. By formulating a waste management strategy that addresses these pressing SWM problems, it is possible to incorporate highly effective priority activities.

In four states of FSM, the following priority activities are under way, as seen above in the section of Results/Outputs:

- YAP: Pilot Project to expand the public collection service
- CHUUK: Re-introduction of CDS
- POHNPEI: Improvement of Container Deposit System (CDS)
- KOSRAE: Introduction of Inter-Municipal Collection System (IMCS)



Contributions to SDGs

This highly contributes to the **Target 12.5** *By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse of the Goal 12 Responsible consumption and production.*

Author(s) / Contact Details

J-PRISM II: Ms. Misa OISHI (oishimisa@gmail.com)

Peleliu State Government: Ms. Michelle Kodep (Maintenance worker/ Recycle Project, PSG) ;Ms. Shari Nicholas (State Finance Officer/ Chief of Staff, PSG)

Relevant Websites/ Resources

None

Publisher

J-PRISM: The Project for Promotion of Regional Initiative Solid Waste Management, JICA: Japan International Cooperation Agency

Acknowledgments

SPREP: Secretariat of the Pacific Regional Environmental Programme



KEY WORDS

3R + Return,
CDL, Remote Islands

Type of Document

a good practice fact
sheet

Target Audience

Officials of PICs
Donors

Publication Date

August 2020



Planning and Implementation of Inter-Municipal Collection System (IMCS) in Kosrae



Federated States of Micronesia
State of Kosrae

How IMCS successfully introduced in Kosrae

In Kosrae, where four municipalities are mandated to provide collection services to the residents, the municipalities with a weaker financial base had been struggling to provide regular collection services to the residents. Illegal heaps of wastes had been created, especially in the municipalities with no regular waste collection services. These illegal dumps have been removed, through the efforts of KIRMA, in collaboration with DT&I. These illegal heaps clearly showed the negative consequences of a lack of regular collections in some municipalities.

Two factors were important in the development of this collection system: i) DT&I's procurement of a new 4-ton compactor truck by the Non-Project Grand Aid of Japan, and ii) the J-PRISM II's survey result that revealed only 18 tons per week of waste are discharged from all the four municipalities. The new compactor truck of DT&I is big enough to collect all of the waste generated in the island and transport it to the public disposal site. Thus the J-PRISM II experts recommended key stakeholders to consider the introduction of an Integrated Municipal Collection System (IMCS) instead of a collection service from each individual municipality. Key stakeholders conducted a series of discussions among themselves, such as mayors, DT&I, KIRMA and the Governor's Office, and decided to introduce the IMCS.

Leading Agency(s)

Kosrae Island Resource Management Authority (KIRMA), Department of Transportation and Infrastructure (DT&I), and Municipalities (Lelu, Tafunsak, Malem, Utwe)

Location/ Geographical Coverage

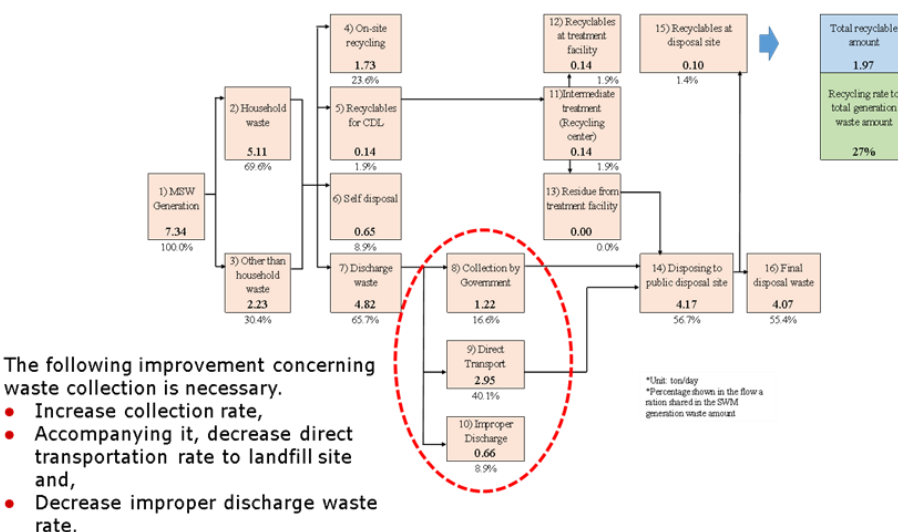


Measures/ Approach

A step-by-step approach was taken by paying special attention to consensus building among stakeholders in each step, as seen below.

Step 1: Identifying the most urgent SWM issue through understanding the current SWM situations technically as well as quantitatively

To clarify the current status and issues of waste in state of Kosrae, SWM baseline surveys were conducted in Kosrae in June 2017, and the waste flow shown in the figure shown was drawn and presented to key stakeholders.



The waste flow analysis in Kosrae shows that the amount of waste collected by municipalities accounts for only 16% of the waste generated, while more than 40% of wastes were self-discharged to the dumpsite, and 9% were improperly discharged. These disappointing figures made key stakeholders realize how serious the problem was and helped them reach a consensus to improve waste collection as a priority.

Step 2: Taking the decision to introduce IMCS

As detailed in the Success Factors, DT&I's procurement of a new 4-ton compactor truck by the Non-Project Grand Aid of Japan, and the survey result that revealed only 18 tons of waste are discharged from all the four municipalities made IMCS feasible in Kosrae. Key stakeholders conducted a series of discussions among themselves, such as mayors, DT&I, KIRMA and the Governor's Office, and decided to introduce the IMCS.

Step 3: Planning IMCS

Before the introduction of any IMCS, three issues had to be clarified first. They are: (i) who operates IMCS, (ii) how to finance IMCS and (iii) which collection system shall be employed.

- Who operates IMCS

After series of discussions, it was concluded that DT&I would be the operating body because DT&I has more human resources with knowledge of heavy vehicles, as well as the maintenance systems with a workshop for such vehicles. Thus the State Code was amended on November 21, 2019 in which Division of Solid Waste Management is established under DT&I and the IMCS is to be operated by DT&I. Furthermore, salaries for the additional three persons of the Division of Solid Waste Management were appropriated under the State's general budget.

- *How to finance IMCS*

Budget required for collection service is US\$16,000 per year. With the amendment of the State Code, the state (i.e. DT&I) provides US\$10,000, being the labor cost. The remaining US\$6,000 is agreed to be covered by the four municipalities, divided up on a formula based on population size. DT&I and each municipality signed Memorandum of Understanding (MoU) to this effect.

- *Which collection system*

Collection method: curbside collection, with a sound system to alert the public that the truck is on its way

Discharging containers: The waste containers are 34-gallon wheelie trash-bins with lids, distributed to all households along with a wire platform on which to place the wheelie bins. The purchase cost of the wheelie bins and the wire material for the platform were provided by KIRMA who successfully obtained funding through the US Compact Funds.

Coverage area: Coverage area is limited to places which the 4 ton compactor truck can easily access. Other inaccessible areas will be covered by municipality vehicles, as was previously practiced.

Collection frequency: Once in a week per municipality. For Lelu and Tafunsak, there will be two trips required to collect their amount of discharged waste.

Step 4: Public Awareness by KIRMA

Community meetings were held in each municipality before the inauguration of the IMCS. In the meetings, KIRMA explained how to discharge waste, types of waste residents can discharge, types of unacceptable waste, and collection times for each municipality. KIRMA, in collaboration with J-PRISM II, produced brochures as well as stickers to help raise people's awareness.

Step 5: Preparatory works by DT&I

The following preparatory work was also carried out by DT&I prior to IMCS

- ✓ Training of collection crew
- ✓ Confirmation of the collection route and removal of obstacles on the

route

- ✓ Installation of a sound system on the truck to alert the public

Stakeholders/ Actors

- **Residents** of Kosrae are beneficiaries.
- **Residents** are the users of this good practice (IMCS) which was inaugurated with the collaborative efforts of the state agencies, namely **DT&I, KIRMA** and the **four municipalities**.
- The IMCS is primarily implemented by **DT&I**.
- Important external factors are the timely procurement of a **new 4-ton compactor truck** through the Non-Project Grand Aid of Japan

Results/ Outputs

Opening Ceremony

The IMCS opening ceremony was held on February 17 2020, a week after the collection started, with attendees including the Governor of the State.



Monitoring for the 1st week of IMCS (Feb. 10-14th, 2020)

Start-up inspection

The driver and the administrator responsible for waste management worked together to conduct a daily inspection of the compactor truck according to an inspection checklist before starting the collection run. The daily inspection procedure has improved, and the compactor truck now leaves on time.

Coordinating with municipality collection

Each of the 4 municipalities has an area where the compactor truck cannot enter, so the municipality's collection vehicles continue to operate in these areas to collect wastes. However, the time and location were decided for each municipality to transfer the collected waste to the compactor truck so that municipalities do not have to transport it all the way to the landfill site.



Municipal staff promote IMCS and provides guidance to residents

At the time of the first IMCS collection, a municipal official (including the Mayor himself for Utwe) provided guidance on the waste discharge manner to residents

and also encouraged them to pay the waste collection fees.



Inappropriate waste

Residents were notified of unacceptable waste that could damage the compactor truck, including cartridge gas cans. It is necessary to patiently inform the residents to help them fully understand what waste is suitable to go into the truck.



Sound system

At the time of waste collection, local song about Kosrae's beauty is played by the truck sound system, signaling the arrival of the collection truck. This was well received by the residents.



End of work inspection

The compactor truck is equipped with a simple cleaning device. The body is washed at the end of each day when the last waste is dumped at the landfill site.



Result of quantitative monitoring

Lelu and Tafunsak required two trips, while Malem and Utwe required only one trip in the morning. From the result of one week of waste collection, it can be said that the collection days and number of trips were sufficient to handle the waste generated.

The travel distance per week is about 160 km (100 miles), total fuel (diesel) consumption is 25 gallons per week (95 liter per week), and fuel efficiency was 6.3 km per gallon (3.9 mile per gallon, 1.7 liter per km). The fuel consumption was as expected.

Total collected waste is around 11 tons per week. The amount of waste discharged

at the time of the baseline survey was estimated to be 1.22 tons per day, and the weekly discharged waste amount was estimated to be 8.5 tons. Therefore, it can be said that the amount collected at the IMCS was 1.3 times that of the baseline survey.

Table 4 Result of quantitative monitoring

Item	unit	Lelu		Tafunsak		Malem	Utwe	Weekly total
		(am)	(pm)	(am)	(pm)			
Collection time	hour	3	3	3.75	1.25	4	4	19
Travel distance	km	16	24	32	22	30	33	157
	Mile	9.9	14.9	19.9	13.7	18.6	20.5	97.6
Fuel consumption	gallon	-	-	-	-	-	-	25
Fuel economy	km/gal	-	-	-	-	-	-	6.3
	mile/gal	-	-	-	-	-	-	3.9
Waste amount	ton	1.72	1.88	2.42	0.52	2.4	2.1	11.04

Success Factors

The following factors, which are essential for the successful introduction of any IMCS, can be said as pre-conditions rather than the success factors.

Procurement of a waste collection vehicle

A collection vehicle was procured and arrived in Kosrae in October 2019, and the subsequent training was carried out from October 29 till November 1, 2019.



Basic specifications:

- ✓ Type : Press type compactor truck
- ✓ Body capacity: 10.2 m3 (4 - 5.5 tons)

Amount of waste discharged

From the baseline survey, the amount of waste discharged for the 4 municipality in total is 18 tons in a week:

(waste discharged in a week) = (population) x (per capita waste discharge amount) x 7 days/state = 6,616 x 387 x 7 ÷ 1000 = 18 ton/week



Waste collection cost

Waste collection cost was estimated through following calculations. It was estimated that US\$16,000 per year is necessary, including labor cost.

- ✓ Capacity of the compactor truck: 4ton/trip
- ✓ Number of collection trips: 6 trips/week

- ✓ Travelling distance for collection and transportation: 170km/week
- ✓ Fuel economy: 170km / 8km/gallon = 21gallon/week
- ✓ Fuel cost per month: 21gallon/week x 4weeks x \$4.5/gallon = \$378/month
- ✓ Maintenance cost: (10% of fuel cost): \$38/month
- ✓ Labor cost (driver and 2 collection crew): \$300 x 3persons = \$900/month
- ✓ Collection cost per month: 378+38+900 = \$1,316 /month ⇒ \$1,300/month
- ✓ Collection cost per year: \$1,300 x 12month = \$15,600 ⇒ \$16,000/year (collection cost \$5,000 /year without labor cost)

The waste discharged from the four municipalities was estimated as 18 ton per week, and a new 4-ton compactor truck is enough to collect waste from all four municipalities, thus the entire state. Also, the cost for the IMCS was estimated, so key agencies could budget successfully to bear the estimated IMCS cost. Timely procurement of a 4-ton compactor truck along with the quantitative data of the waste amount as well as the cost for IMCS made it possible for key agencies to consult constructively and finally introduce the IMCS.

Constraints

There are no serious constraints so far. This collection system of the IMCS works well as long as the new 4-ton compactor truck runs. However, the breakdown of the truck would be a serious constraint if that happened. (To address this issue in Kosrae, another new 4-ton compactor truck has been procured and will be used as a back-up truck.)

Sustainability

Sustainability can be examined in terms of (i) financial sustainability, (ii) organizational sustainability and (iii) technical sustainability.

(1) Financial sustainability

Thanks to the efforts made by DT&I, the SWM section was established under DT&I and US\$10,000 out of US\$16,000 has been secured from the state general budget. As long as the remaining of US\$6,000 is and will be borne by municipalities through collection fees, financial sustainability will be secure.

(2) Organizational sustainability

The SWM section was established under DT&I by amending the state code. The four municipalities, and other key organizations, are also statutory organizations. Thus, the organizational sustainability is firmly secure.

(3) Technical sustainability

The IMCS is based on the premise that the 4-ton compactor truck is operational. Thus, correct operation and maintenance is very important from the view point of technical sustainability. Since the life of collection vehicles is short in the islands

due to the damage from salt-laden air, not only proper operation and maintenance but also planned investment for future replacement by utilizing external funds is also necessary. In addition, the quantitative monitoring of IMCS needs to be continued in order to adjust collection dates, frequency, routes, etc., as necessary.

Replicability and/or Up-scaling

Inter-municipal collection system is a mechanism suitable for providing efficient collection services especially among small-scale local governments that are often financially weak and have difficulty to secure suitable collection vehicles. It can be introduced among local governments of a certain scale, too, however it is important to decide the implementing body, agree on the cost sharing method, and employ the same collection system among all local governments as shown in this case.

Lessons Learnt and Conclusion

Consensus building in every step is essential to introduce a new system.

With the background of the timely acquisition of a new compactor truck through the grant aid scheme and the small scale of the waste collection amount, the waste collection of the entire state became possible. Consensus building in every step, i.e. the division of roles of key organizations, cost sharing of the state and four municipalities, etc., is essential. In this case, consensus building became possible through the strong leadership of key organizations, namely DT&I and KIRMA, as well as the quantitative information such as the amount of waste discharged from each municipality, the cost to run IMCS, etc, which J-PRISM technical advisors assisted with.



Contributions to SDGs

This highly contributes to the **Target 12.5** By 2030, *substantially reduce waste generation through prevention, reduction, recycling and reuse* of the **Goal 12 Responsible consumption and production**.

Author(s) / Contact Details

J-PRISM II: Ms. Misa OISHI (oishimisa@gmail.com)

Peleliu State Government: Ms. Michelle Kodep (Maintenance worker/ Recycle Project, PSG) ;Ms. Shari Nicholas (State Finance Officer/ Chief of Staff, PSG)

Relevant Websites/ Resources

None

Publisher

J-PRISM: The Project for Promotion of Regional Initiative Solid Waste Management, JICA: Japan International Cooperation Agency

Acknowledgments

SPREP: Secretariat of the Pacific Regional Environmental Programme



KEY WORDS

3R + Return,
CDL

Type of Document

a good practice fact
sheet

Target Audience

Officials of PICs
Donors

Publication Date

August 2020



Introduction of Container Deposit Recycling System in RMI



Republic of Marshall Islands

Majuro Atoll

Successful introduction of Container Deposit Recycling in Majuro, Republic of the Marshall Islands (RMI)

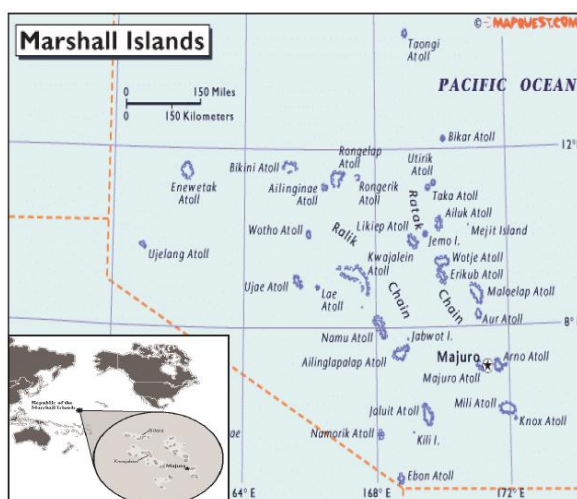
In mid 2018 the Republic of the Marshall Islands (RMI) commenced operation of a deposit/refund recycling system that operates under the Styrofoam Cups and Plates and Plastic Products Prohibition and Container Deposit Act 2016, as amended in early 2018. The system collects aluminum drink cans, PET plastic and glass drink bottles.

The recycling system Regulations came into effect at the start of July 2018 and at that time RMI Customs in Majuro started collecting 6¢ deposits on the specified beverage cans and bottles, whilst the Majuro Atoll Waste Company (MAWC) started collecting cans and bottles for recycling and paying out 5¢ refunds to the public a month later. The design and early stage implementation of the program was supported by J-PRISM II Technical Assistance from 2017 – 2019.

Leading Agency(s)

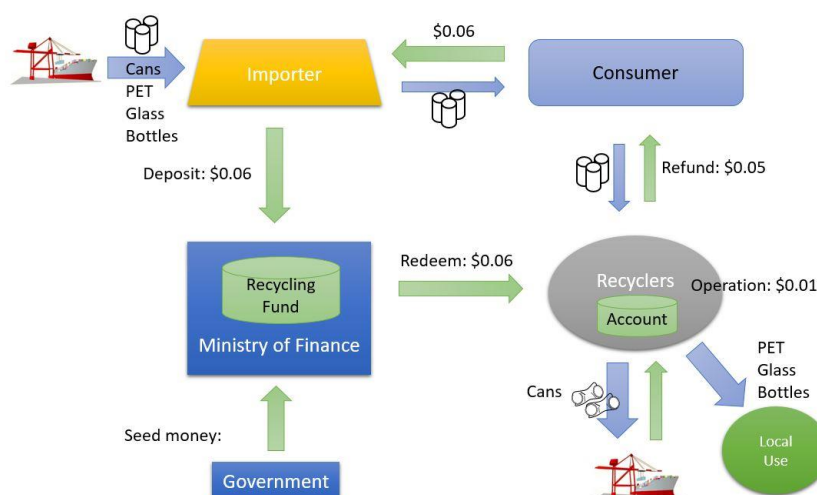
The Marshall Islands Environmental Protection Authority (EPA) is the lead agency for the Container Deposit Recycling System, as the designated Recycling Agent under the legislation. On Majuro, MAWC is contracted by EPA to operate the recycling process, and pay out refunds, as the 'System Operator'.

Location/ Geographical Coverage



Measures/ Approach

Small Pacific Islands have struggled with litter problems and improving recycling. Collecting deposits on drink cans and bottles at import, or on local production, and paying out refunds when the items are returned for recycling has made a very significant improvement to recycling rates in other countries in the region. This approach uses Container Deposit Legislation to empower government to collect deposits and pay out refunds. The legislation typically consists of a governing Act, along with a Regulation that provides the details of the system. This approach does two things: first, it generates a financial incentive for the public to collect their cans & bottles for recycling, as they get money for each one returned; and second, with the difference between the deposit and refund comprising a 'Handling Fee', the cost of running the system can be built-in, generating a financially sustainable approach that is entirely self-funded. J-PRISM provided technical assistance to the Republic of the Marshall Islands government from 2017 to introduce such a system into the country. The system is shown in the following diagram:



The recycling system handles aluminum cans, PET plastic and glass bottles, all under 1 liter. The deposit rate is 6¢, paid at import - or at first sale in the case of the single local water bottling company - and the refund is 5¢, which is paid out to the public when a designated item is bought in to the Collection Point. A minimum number of 20 items must be presented for refund, so that payments are in round dollars, as this greatly facilitates the accounting and payment process for the public. Payment is by cash at the recycling center immediately after items are counted.

The aluminum cans are baled in a large crusher, packed into shipping containers, and exported for recycling back into cans or other aluminum products overseas. PET bottles are baled in the same machine, but market conditions have prevented their export as there is a global glut of PET bottles. These bales are used for 'clean fill' at certain locations under EPA supervision, as PET is a very tough, inert plastic. Glass bottles are low in number, and are

finely crushed and used for internal roads within the landfill where the Collection Point is located. Currently only one Collection Point exists, on Majuro, the capital, whilst a second is under preparation at Ebeye Island in Kwajalein Atoll.

J-PRISM II provided technical support to amend the legislation passed initially in 2016, which was based on a US model that did not suit Marshallese conditions. Along with the amendment, a Recycling Regulation was required. J-PRISM experts also worked alongside EPA counterparts to design the details of the system, and prepare all local actors for their various roles; in particular, the process by which the recycling system operator makes their weekly claim to the Recycling Fund, and the supporting data required to validate that claim, was an essential system to have in place prior to the system going 'live'. Good data collection is extremely important to see that the system is operating correctly, that deposits are being paid and refunds paid out, and that there is no smuggling or fraud operating within the system

Stakeholders/ Actors

- The main government agency is **the RMI Environmental Protection Authority (EPA)**, as the EPA has oversight of the system, is the nominal 'Recycling Agent' described in the Recycling Regulations. The EPA holds a contract with the business that does the physical work of collecting and processing the cans & bottles, the 'System Operator'.
- **The Ministry of Finance** manages the Recycling Special Revenue Fund, collecting deposits at import through RMI Customs and the local manufacturer's deposits for locally produced bottled water, and pays out refunds to the 'System Operator' on a weekly basis.
- **Majuro Atoll Waste Company (MAWC** - a State Owned Enterprise) is the 'System Operator' for Majuro, taking cans & bottles from the public, processing the materials through a baling machine, exporting materials, and paying out refunds. Kwajalein Atoll Local Government (KALGOV) will be the System Operator for Ebeye Island.
- **The local business community**, largely importers, are the people who must finance the system by paying the deposits into the Special Revenue Fund before they have sold those products.
- **The public** collect the empty cans and bottles and take them to the Recycling Collection Point to get money for each item. In particular, low income people, and those members of a household who are not in formal employment, are usually the people who take the recyclables to the Collection Point as the recycling takes place during normal business hours. Some people may make a small business by buying small quantities of cans and bottles off others and aggregating materials and taking them to the recycling Collection Point.
- **The country** as a whole gains in lower landfill costs as recyclable materials

are diverted from landfill, and decreased pollution of waterways - particularly inshore coral reefs - as less rubbish is getting into the sea.

Results/ Outputs

The first full year of operation was Financial Year 2019 (FY '19, to September 31st 2019), and during this year the scale of the program became clearer, with over 15 million items being handled. Some of these were 'legacy' items that were on island before the system started, but the number of deposits paid was for over 14 million cans & bottles, which indicates levels of consumption in the RMI. The following numbers are for FY'19:

- **Cans and bottles refunded:** 15.7 million items, being 58.5% aluminum cans, 40.5% PET bottles, and 1% glass bottles collected for recycling.
- **Deposits paid:** 14.4 million cans and bottles paid \$861,250 in deposits into the Recycling Special Revenue Fund held by the Ministry of Finance.
- **Recycling Recovery Rate:** this is not absolutely clear due to the ongoing presence of 'legacy waste' during FY'19, but appears to be of the order of 85%.
- **Refunds paid out to the public:** MAWC paid out \$785,725 to the public in 5¢ refunds, and received \$943,000 from the Ministry of Finance in claims against the Recycling Special Revenue Fund of 6¢ each for items refunded.
- **Income to MAWC:** The amount of Handling Fees that MAWC made from the recycling system was \$157,150, being 1¢ from each item collected; and the sale of the 136 tonnes of crushed aluminum cans raised an income of around \$110,000 after the cost of shipping.
- **Total expenditures by MAWC:** these are not specific in MAWCs accounts, but would be no more than a maximum of \$75,000 for electricity, labor and shipping costs for eight shipping containers of crushed aluminum cans.
- **Overall financial surplus to MAWC:** it can be expected that the system generates a surplus of around \$100,000 per year for MAWC, which helps finance some of their other waste collection activities.
- **Total number of cans collected in the first 15 months:** about 20 million cans and bottles were collected in the first 15 months of the system, and perhaps 2 million of those were existing litter 'legacy waste' cans & bottles that came in before the system started and so had not paid any deposits.

Output

- **Reduced Landfill:** the materials collected are diverted from landfill, so saving space in a highly constrained landfill site at Batkan, which is currently the highest point in the country.
- **Reduced litter:** It is now rare to see cans & bottles as litter on Majuro, as even if they are thrown down on the ground, someone picks them up for refund.
- **Reduced Pollution:** local inshore reefs suffer greatly from can & bottle litter that blows off the land into the sea, and so new waste is less likely to get into the sea due to reduced litter on land. Unfortunately there is still a very severe problem of other wastes dumped on sea shores from households.

Impact

The people of the Marshall Islands have benefited from the recycling system through having a cleaner environment. Some people, especially some with low incomes, have been able to make money by collecting cans & bottles and bringing them in for refunds. This increased income effect can favor unemployed women as they are the ones who usually clean up around the home, and they can turn in the cans and bottles they collect for refunds.

A very significant and clearly seen effect is that the existing litter of drink cans & bottles was cleaned up over the first few months by people keen to raise money. Refunds on these items were financed by the 'Seed Money' set aside by the Government as a start-up fund to buy up existing can and bottle litter.

A potentially negative impact is for importers, who have to find the money to pay the deposits when clearing their cargos through customs, before selling the drinks. This extra cost is passed on to consumers through slightly higher drink prices. However, on informal follow-up with businesses after a year or so of the system none of the business people spoken to a noted drop in sales of drinks. So whilst business did have to find more money at the beginning, this is a one-off effect as the drinks when sold bought that money back, making it easier to fund the next round of deposits.

Innovation

The success of the program in tackling what is usually considered the intractable problems of waste on small islands has encouraged the government to think about new approaches to similar problems, such as waste oil, old tires and end-of-life cars. The same basic principles of Product Stewardship can be applied to these items, and the Container Deposit Recycling System has shown the way forward, and now the EPA is actively looking at new ways to deal with these long-term waste problems, particularly on Majuro.

Success Factors

A very important advantage to the RMI was the fact that MAWC had a recycling shed, built and equipped by the support from the Japanese Government. This facility ensured that when the law came into effect, the infrastructure was in place to handle the 15 million cans and bottles - up to half a million a week sometimes - that were brought in by the public for refunds. Prior to this, MAWC had been crushing cans in the open air with a very small baling machine that was very inefficient. The new shed and large baling press provide all-weather operation and good capacity for expansion in the future.

An essential element was the strong political support provided by both the President and the Cabinet, and the institutional support from civil servants.

Key people in the government clearly understood how the Container Deposit Recycling System could deal with part of a long-standing problem in the Marshall Islands. The Minister responsible for Environment in 2016 initiated the original law, and guided it through Cabinet and the legislative process. The General Manager of the EPA, the agency charged with implementing the law, actively supported the measure and ensured that staff resources were made available to the program. Key people in the Ministry of Finance and Customs took action to put in place the financial processes and administrative procedures that are essential to make the system work. The Government Chief Secretary at the time, an economist, clearly understood the value of this economics-based approach. The President of the RMI was herself enthusiastic about the program, and the Cabinet made the crucial decision to allocate sufficient Seed Money to ensure that the program could survive the first few months, when deposits would be less than refunds due to the legacy waste problem. Finally, the local business community actively supported and cooperated with the implementation, even though they were the ones who had to initially find the money to finance the deposits, until their products were sold. This was an excellent example of how business people's appreciation of the wider public good took precedence over their immediate business requirements.

Good communication with all these stakeholders was essential to get them to participate in a positive way, and EPA acted as the central communicator and project driver, and ensured that full effort was made to keep stakeholders informed as the program rolled out, and produce public information announcements at the time of the system start.

Constraints

A very significant challenge at the start of introducing any container deposit recycling systems is how to deal with the 'Legacy Waste', being the litter already lying around which did not pay a deposit as it arrived before the system started. However, people will go and collect these cans & bottles and seek refunds: it is not practical to determine on which date a can or bottle was imported. To pay these deposits requires additional funding - the 'Seed Money'

- that must be provided at the start of the system. How much funds are required depends on how many items that are lying around as litter and did not pay deposits, and this is something that can only be known afterwards. To determine how much 'Seed Money' may be required, analysis must be done of existing consumption, existing litter, and the likelihood of people going to significant lengths to find old cans & bottles, which is related to socio-economic factors. In the RMI, the Government set aside \$100,000, paid for an additional 1.66 million cans & bottles; it is important to remember that the Seed Money must buy items at the deposit rate, not the refund rate, as the deposit rate is the cost to the Recycling Fund for each item claimed by the System Operator.

It was essential at the outset of designing a Container Deposit Recycling System for the RMI to clearly understand the existing conditions with regard to Customs procedures, local business practices, logistical systems, and the financial systems used by the Ministry of Finance. If the existing elements that will be involved in the Container Deposit Recycling System are carefully studied and understood, then the details of the actual system itself can be developed with existing conditions in mind. The opposite approach is to pass the legislation and then work out how to make the recycling system work: this was what happened when the RMI government passed the initial Act in 2016 which legislated the recycling system, and to follow the law in practical terms was not feasible (as for example the EPA was mandated to go around every store selling drinks and collect the deposits based on sales). The challenge when J-PRISM was asked to help was to re-design the system into a practical one, but only amend the existing Act, rather than start again with a fresh sheet, which would have been easier

The business community must be very largely in agreement with the proposals, and to achieve this requires effort to genuinely consult them and listen to what they say. Businesses provide the deposits in the first instance that make the system work; the business community must see that the value to their wider society is greater than the initial constraint to their operations. Business was also very wary that the deposit money placed into the Recycling Fund would really be returned to consumers, and that the system would not become in part some kind of tax measure. If people cannot easily gain the refunds on their cans & bottles, then deposit money remains in the Recycling Fund, and the entire system can become an economic drag rather than a boon.

A significant constraint exists in the RMI because of the dispersed nature of the country. With about a quarter of the population living on outer islands, it is hard for these people to get their cans & bottles back to a Collection Point and gain their refunds. Majuro currently only has one Collection Point, and could usefully use two more, one at Laura and one at Rita, so that people have less far to travel to get their refunds, as travel costs money and typically it is low income people who seek their refunds. These Collection Points could be open

only one or two days per week, and still be effective, with materials transported back to the main site for processing. Ebeye currently has no Collection Point, but one is planned, and this lack is currently a significant constraint for the 10,000 or so people in Kwajalein who might want to seek refunds.

Sustainability

A container deposit recycling system is a classic example of a circular economy as it has built-in sustainability, if operated correctly. The incoming deposits provide the money for the refunds and the processing of materials, and so no additional funding inputs should be required once the system has settled down. Processing costs - the 'Handling Fees' - are covered by the difference between the deposit paid at import and the refund paid to the public, as the recycling 'System Operator' claims back the full deposit amount from the Recycling Fund. If processing costs rise, the deposit can be increased, whilst the refund stays the same, so increasing the Handling Fee. Deposits can be fractions of a cent - for example 6.5¢ - as deposits are paid in single large payments into the fund when shipments of drinks clear customs (or are produced locally in the case of the local water bottler).

There are ways in which this sustainability can be upset: if refund rates are low, the cost of processing each unit is higher; low refund rates usually mean it is hard for people to get their cans & bottles refunded, such as when there are few or irregularly open Collection Points. Another problem is smuggling, where some importers do not declare cargos and the deposits are not paid: this typically involves beer and the government loses the excise tax too. As noted above, the greatest challenge is at the beginning, with the 'legacy waste' which, if not sufficiently funded, can crash the system through cash flow problems.

For the RMI, data from FY'19 indicate that the recycling recovery rate is around 85%; in a later year, where all legacy waste is clearly gone, the recycling rate is simply the difference between the number paying deposits and the number getting refunds. If the recycling rate is over 100% after two years then we can expect that some deposits are not being paid, or that miss-counting or fraud is taking place at the Collection Points. As the years go by, items that are not refunded will leave their deposits in the Recycling Fund, and these are called 'un-redeemed deposits'. This money should slowly build up over time, and ideally the legislation would allow it to be used to support the recycling infrastructure in some way.

These systems produce excellent and exact data, and it is essential that the system has an annual review, and a report is made detailing numbers of items handled and cash flows of deposits and refunds. In this way, emerging problems can be identified and addressed. For the last three months of 2019, the recycling system was collecting around 225,000 cans & bottles per week, with refund pay-outs to the public of around \$13,500 per week.

Replicability and/or Up-scaling

It is possible to be replicated in any other remote islands if the full-scale CDL is introduced and functioning well in the main island. The essence of the extended CDL network such as how it works both in the main island and remote islands can be shared not only within the country but also among other PICs. The system is comparatively simple to replicate, but it is essential to understand that each country is slightly different, and a close study of local conditions, applying the basic principles seen in the RMI, will provide good information to ensure that a system is devised, but with nuances that suit that particular place. For example, geography plays an essential part when considering Pacific Islands: some countries are a single island, with maybe a loop road; some are vast numbers of tiny islands with low numbers of inhabitants spread over huge areas of ocean, with one urban centre with more than half of all residents. The type of currency in use, common payment methods, government financial processes and the structure of the lead agency are all key factors to consider early on. Whether a country has a significant local industry of drink bottlers may be a key factor in designing the overall method used to manage the recycling fund.

Lessons Learnt

It is essential to design the recycling system, how the money might flow, before finalizing any legislation.

The legislation must enable the system as designed: this means that much work must be done prior to developing the detail of the legislation. It must be clear in principal and outline what the legislation will cover so as to generate the political support required for the government to direct that the legislation should be drafted, but it is essential that the legal framework does not become a constraint to the operational practicalities of the recycling system.

The legislation ideally will be drafted so that an Act sets out the key elements, and provides powers to regulate those general approaches and materials; the Regulations under that Act can contain the detail about particular items that are covered. However, if the Act contains specifics, for example the rates of deposit and refund and specifies what materials or products are covered, it can be a significant constraint on modifying the system where this is needed. In the RMI, the initial legislation was based on a model from individual States of the USA (typically called a 'Bottle Bill') that does not suit RMI conditions, and as initially passed was unworkable for the RMI. But the drafters had acted in good faith by taking an existing piece of legislation as a model for the RMI. Well drafted legislation will allow other recyclable materials to be easily added at a later date if the government wishes to do so, thus expanding the existing system but still using the underlying principals and approach.

Conclusion

This example illustrates the potential of CDL systems beyond expectations

The recycling system has been operating for two years now. The effect on can and bottle litter in Majuro is very clear, and widely noted. The system is not only self-financing, but provides additional income to help finance some of MAWC's other activities of collecting general household waste. But the most important thing is perhaps that the introduction of this system has shown many people that new ideas can work, and that consultation with key participants in the design phase meant that everyone was on board as the system rolled out. Work still needs to be done, however, to set up the Collection Point at Ebeye, and also, make it easier for Majuro residents to collect refunds by having perhaps two more Collection Points on Majuro.

This is also an excellent example of how donor Technical Assistance can provide the help required to get a system up and running, but then step back as the system settles in, local people run things, and the experts are no longer required, having done their job. The J-PRISM approach makes a commitment to partners to see a project through, working alongside local counterparts, so that governments know they have that support when taking the initial legislative steps.

There can be no doubt that the recycling system is a success, with 14 million items a year processed, and a recovery rate with only one Collection Point of around 85%. Both the public and the government have seen the advantages of recycling as a way to reduce waste, and so it should be easier to now move on to tackling some of the harder to deal with items such as e-waste, white ware, waste oils, and dead vehicles.



Contributions to SDGs

This highly contributes to the **Target 12.5** *By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse of the Goal 12 Responsible consumption and production.*

Publisher

J-PRISM: The Project for Promotion of Regional Initiative Solid Waste Management, JICA: Japan International Cooperation Agency

Acknowledgments

SPREP: Secretariat of the Pacific Regional Environmental Programme



KEY WORDS

3R + Return,
CDL

Type of Document
a good practice fact
sheet

Target Audience
Officials of PICs
Donors

Publication Date
August 2020



Development of New Landfill Lagoon Side in RMI



Republic of Marshall Islands
Majuro Atoll

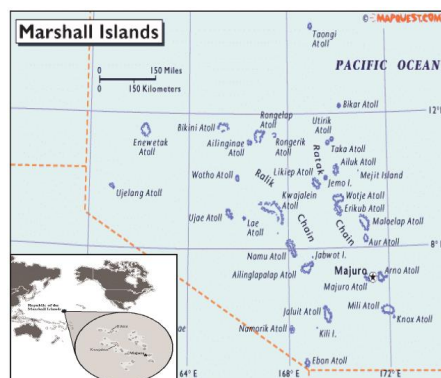
Majuro Atoll holds the capital of the Republic of the Marshall Islands, and is the largest urban area in the country. Being an atoll island, land is only just above sea-level, and no space available for landfill. The existing dumpsite at Batkan village has been in use for over twenty years, and the dumpsite now holds a pile of waste 17 metres high, the highest point in the country, and the situation on the dumpsite is critical. The current situation cannot continue as waste can escape into the ocean from the pile, but there has understandably been resistance to using waste for land reclamation as this might cause pollution of the sea, especially as financial resources are limited. J-PRISM has been assisting the RMI to use waste to create new landfill lagoon-side using natural processes to treat the leachate from the waste. This case study looks at these recent efforts to improve the landfill situation on Majuro.



Leading Agency(s)

The lead agency for managing the Majuro Landfill is the Majuro Atoll Waste Company (MAWC), which is a state-owned enterprise set up in 2007 by the RMI government to collect waste and manage the dumpsite at Batkan on Majuro Atoll. The other lead agencies are the Ministry of Works Infrastructure and Utilities (MWIU), and the Environmental Protection Authority (EPA) of the Republic of the Marshall Islands, which is the regulatory agency for landfills.

Location/ Geographical Coverage



The Marshall Islands comprise 33 atolls located in the central tropical North Pacific, as seen in the map above, from around 4 to 10 degrees north. There are only two urban centers of any size - Majuro and Ebeye - and these hold three quarters of the population, and most consumption and generation of waste takes place in these two locations. Majuro Atoll had around 27,000 inhabitants at the time of the 2011 census, but recent data from the 2021 census indicate a significant fall in population to around 20,000. Majuro is the largest tuna transshipment port in the Pacific, and at any time a number of fishing vessels, and their crew, are also in the lagoon, and generate waste.

An atoll island has two coast types, lagoon-side and ocean-side. Ocean-side sea walls must withstand large wave impacts from ocean breakers, and must be much stronger and more expensive than lagoon-side sea walls, where wave action - depending on location - is usually much weaker.

Measures/Approach

This case study concerns a landfill pilot project for Majuro, using a method for atolls on the lagoon side of the island. The aim is to demonstrate that lagoon-side containment walls can be built at affordable cost, whilst still preventing pollution from the waste to the lagoon waters. The overall method is based the lagoon landfill system used in Tarawa, Kiribati, a neighboring atoll country to the south. The geography of Majuro and Tarawa atolls are similar, except that Tarawa has a shallower lagoon with tidal sand flats, whilst in Majuro the lagoon tends to be deeper.

In the early 2000s, an Asian Development Bank project built two new landfills in Tarawa. These had three walls sitting on the lagoon tidal flat, with the fourth wall comprising the existing land. One landfill runs parallel with a causeway joining two islands, so making that strip of land wider, and the other was behind the main electrical power house. One landfill opened in 2004, whilst the second did not open until 2012. This time lag allowed some comparison to be made on the lagoon water quality between the impacts of the landfill with waste in it, and the similar landfill not yet accepting waste. Comprehensive water tests were taken at both sites in 2012 before the second landfill opened for waste, so allowing a benchmarking of the existing pollution in the lagoon around the site of the landfills. This was essential in order to determine the long-term impact of the landfill operations. The landfill walls were built of a trapezoid section of sand covered on both sides by a concrete skin, as can be seen at Figure 1. The floor of the landfill was lagoon sand, stabilized by mixing with cement.

These water tests showed that the landfill in use seemed to have very little impact on lagoon water quality. It was also seen that the empty landfill held brackish water at a constant mean sea level, apparently unaffected by the

tidal movement in the lagoon. Careful study determined that the water level in the empty landfill did actually move up and down with the tidal cycle, and the lunar cycle, but at about two orders of magnitude less than the tidal movement of the water outside the landfill wall. It was also determined, through careful measurement with water level data loggers, that when a heavy rainfall lifted the landfill water level, it took several days for the level to return to its original equilibrium. These two aspects pointed to a linkage between the water inside and outside of the landfill, but a linkage that was significantly dampened. Discussions amongst various water specialists resulted in the development of a hypothesis that the water was moving between the lagoon and the landfill largely through the sand floor of the landfill. This effect is well known on atolls as shallow freshwater wells provide many houses with water, and the water level in these wells can be observed to move with the tide, especially if near a beach. The lack of water pollution caused by the in-use landfill was hypothesised to be the result of the grains of sand acting as a particle filter, and sand is often used for this function in water treatment systems. Of note also is that Tarawa has no industry, and chemical and hazardous liquid wastes that may be common in developed country landfill are not present. This is a similar situation to Majuro.

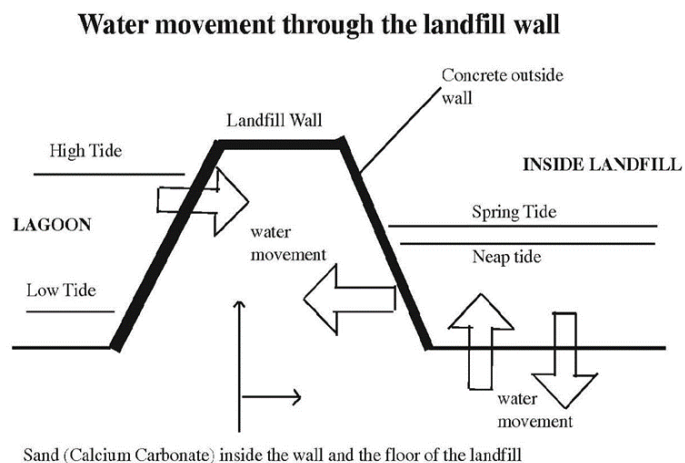


Figure 1: Movement of water through landfill wall

Subsequent to this, the previous work of a Belgian university to use calcium carbonate as part of a leachate treatment system was bought to bear on the issue. Coral sand is almost entirely calcium carbonate as it is composed of tiny bits of dead coral and other animal shells. The European work showed that where a shallow hydraulic gradient can be maintained across the calcium carbonate, and the temperature maintained above 20°C, then conditions are very good for the acidic landfill leachate to be neutralised by

the alkaline coral sand. Understanding this process is crucial to designing the lagoon sea wall. The tide coming and going acts to maintain a varying but simple hydraulic gradient across the sand barrier, slowly allowing rain that collects in the landfill to escape and equilibrium to be restored. But it is essential for this system to work that water movement between waste and lagoon, through a thick sand barrier, is allowed at a low but sufficient rate.

It is essential that rain that falls into the landfill can escape, or else the landfill will fill with water and become boggy, and make heavy machine operation very difficult. If the conventional approach of a landfill liner is used in a landfill below sea level, rain water in the landfill must be pumped out and that water will be polluted, thus requiring treatment ponds on the land before release. The significant land area required for such treatment is typically not available on an atoll; if the leachate is simply pumped into the sea, then it is pointless to put an impermeable liner in the floor of the landfill. As the base of the landfill is below sea level significant pumping effort is required, and this is expensive, requiring continual pumping and electricity for pumps. In addition, if a landfill liner is laid down below sea level, the water pressure from below will tend to lift the liner unless it is heavily weighted down immediately after laying, which of course reduces the volume of waste the cell can accept. All the above mean that it is not realistic to use a liner in an atoll landfill, where the base will inevitably be below mean sea level.

In the light of what was found had worked well in Tarawa, representatives from MAWC, MWIU and EPA visited Tarawa in 2014 with assistance from the SPREP PacWaste project, and were shown the Tarawa landfills. By the time the J-PRISM II project commenced in the RMI, the situation at the landfill site at Batkan had become critical. Piling the waste up higher was getting more and more difficult. MAWC MWIU and EPA consulted with J-PRISM Technical Assistance staff and a plan was drawn up to fill an area on the lagoon-side, across the road from the existing Batkan dumpsite, and test the Tarawa approach in a Majuro setting.

A sea wall into the lagoon has been built across a bay, and two cells have been created behind the wall. Coral sand has been excavated from inside the cells to provide the calcium carbonate material to go behind the sea wall. In addition, sand has been excavated to make the internal cell wall between the two cells, which also provides a roadway to behind the sea wall for construction. Figure 2 shows the two cell layout. By dividing the area into two cells, the filling process is greatly facilitated, and the filling can take place into the cell from the site access gateway from the road, into the

centre of the landfill, along the dividing wall which also acts as an access road. The tipping face then works away from the wall - to the right in figure 2 - and allows steady access into the cell. Great care has to be taken in order to avoid heavy equipment falling into the water in the cell, This is complicated by the fact that much of the waste floats, so it can be harder to see where the solid filled area has reached. Nevertheless, with care and good operators, the tipping face is pushed out, compacting old waste with fresh as it moves, and the trucks bringing in fresh waste also act to assist compaction near the tipping face.



Figure 2: showing Cell 1 at the right, being filled, and Cell 2 at the left, under construction

Stakeholders/Actors

MAWC is the operator of the landfill, and MWIU has taken the lead on developing the design of the containment walls, and contracting out the construction. EPA is responsible as the regulatory agency to monitor the landfill and determine that any pollution found is acceptable and within limits. J-PRISM II technical assistance staff have provided advice and support through the design process, although since February 2020 this support has been remotely provided due to Covid-19 restrictions. The final design of the sea wall was decided by MWIU, and construction has been monitored by the ministry. Funding for construction has come through the RMI government.

Results/Outputs

Working with this lagoon-side landfill has shown MAWC a different way to operate a landfill. The existing Batkan site piles up waste as it has no space, but in the new area, waste is spread and compacted in a more conventional landfill management way. This method gets far more waste into the same space, because the density of the waste is much greater. The other key

aspect of this pilot is to have two cells. One cell can be filled to the level of the main road, and then covered with some sand and left, whilst the second cell is filled. If incoming waste trucks to Cell 2 are then diverted across the first cell, they will add to compaction whilst the second is filled. Once the second cell is filled, after about a year, the tipping face can go back onto the first cell. Some subsidence will have taken place due to the fairly high organic content of the waste stream in Majuro, as this material breaks down much quicker than inorganic waste such as plastics, and so more waste can be packed into Cell 1 later. In addition, if the seawall is built up, the land area can be built up through successive layering of waste, called 'lifts', so that the piece of land ends up higher than the current road, perhaps by around 1-2 metres. Having a high piece of land alongside the road at that point, where the island is very narrow, will help protect the main road from flooding on high tide events.

Success Factors

The ability to build on an existing good model has been a key part of this project. Whilst plans had been in place for several years to build a new landfill in Jenrok, about 10 km away, these had not been fulfilled, and was also budgeted at \$17 million, which was in excess of available funding. The proposed site, which was ocean-side, has subsequently be allocated for a playing field for the next Micronesian Games. J-PRISM provided support to MAWC, MWIU and EPA to develop the proposal for filling lagoon-side at Batkan, with the necessary technical support to help MWIU to design the project in-house.

Challenges/ Constraints

The local community in Majuro has been very wary of formal land-filling at lagoon-side sites, fearing further pollution of a lagoon that is already stressed by a sizable population and fish transshipment operations that regularly see a large number of ocean going fishing boats in the lagoon. This is understandable. Ocean-side landfill has appeared more appealing in that any pollution escaping might be washed into the ocean. But the construction cost of long-term seawalls ocean-side is very high, if they are to be strong enough to withstand the hammering of ocean swells. Thus a concerted effort was made, with the assistance of EPA, to ensure that leading policymakers understood the science behind the lagoon-side wall construction, and how it might protect the lagoon. Another constraint has been that local civil engineers have a certain approach to seawall design, and the design derived from the Tarawa experience to some extent challenges that. For example, sloping external walls are stronger and allow dissipation of wave energy as the waves roll up them, but can be more expensive to build as they use more material per linier meter than vertical walls.

Sustainability

Where good solid landfill is achieved, it can be built up to above surrounding existing land levels, and so provide a long term useful piece of land that may be more resilient to sea level rise. The key is that the containment wall is very thick, with lots of sand between the waste and the concrete wall itself. With a good external wall and sand buttress on the inside, a high degree of compaction of the waste in the landfill can be made. Once then capped off with a covering of a thick layer of sand, this produces good hard ground which can then find a use afterwards. Whilst such land is unsuitable for housing, it can be very useful for industrial types of operations, or for parking of things such as shipping containers - which always take a lot of space - or stockpiles of sand and gravel for construction. Any operation that uses heavy trucks on the site is always good for the first three or so years to help the filled land settle and compact. After that settling period, the land area can be more suitable for a wider range of uses.

Replicability and/or Up-scaling

Building landfills on atolls is extremely challenging due to the problems outlined above: the two key constraints of very little land, and the base of the landfill being below sea level, create major issues around drainage and leachate treatment. Atoll nations are typically small, low income, and do not have resources for complex civil engineering works that would be required where a more conventional landfill approach is taken. The method being tested here has the potential to be repeated elsewhere on a larger landfill. This pilot project can only act short-term to take some pressure off the main Batkan dumpsite, and a new landfill site is desperately needed in Majuro, better placed somewhere away from the urban areas.

The most likely site for a new landfill will be lagoon-side to the west of the airport. Immediately west of the airport and lagoon-side is a semi-industrial area where coral sand is mined and large borrow pits already exist. Past that area to the west, there is a part of the lagoon that is comparatively shallow. A landfill could be built there using the same techniques demonstrated by the Batkan lagoon-side pilot project, where that project can demonstrate that this method does not cause significant lagoon-side pollution. By building a landfill in this area, past the airport, the landfill would be well away from housing, and yet not too far for trucking from the urban area where most waste is generated. In the longer term, a useful piece of land can be built that might find a light industrial use in an area that is already a light industry region of Majuro.

Lessons Learned

The General Manager of MAWC was asked if the new lagoon-side approach had improved operations for MAWC with regard to their landfill operations. He said that "It is much easier for MAWC to tip the waste than to pile it up. Piling up the waste is both inefficient and nor very pleasing to the eye of the public." With regard to the difficulties of filling in a water-filled landfill cell, particularly at the start of operations, MAWC do not report encountering too much difficulty. They report that they layer the waste with sand as an area firms up through compaction, allowing the tipping face to move forward efficiently.

GM Mr. Halston deBrum has this important advice for other atoll nations who might be considering this approach using lagoon-side landfills: "The buy in from relevant stakeholders before any construction happens is very critical. The regulatory, policy makers and landowners must be aware of the project and its benefits to the community. There has been questions raised in the parliament thru the national radio about the project and its potential effects it may have on the marine life on the lagoon side. I believe that continuous explanation of the project is needed and not just a one-off meeting." The ongoing monitoring of the lagoon through regular water tests is an important part of ensuring support from the community as it will show if there are any actual pollution problems occurring.

Regarding equipment that MAWC has used as part of the landfilling, they believe that a bulldozer would make filling more efficient, as currently they have to use an excavator. MAWC are seeking funding for a bulldozer.

Mr. deBrum adds that "MAWC is very grateful for the technical assistance and monitoring that the JPRISM has done during this project. The management team here is able to present to the decision makers the sound reasoning behind the lagoon side landfill extension, through simple interpretation done by the JPRISM team."

Conclusion

This project will show two things: that lagoon-side landfilling can be done without major pollution impacts, as seen in Kiribati. Also, the technique of landfilling with cells, layering and compaction is being used whereas the existing Batkan pile used a different approach of uncompacted waste that is just piled up. Overall, the waste can be used to build new land, and raise land levels, that after capping off with suitable cover layers, can provide land that can be used for purposes other than housing, such as playing fields, shipping container parks, light industrial buildings, a materials recovery facility for recycling, etc, so releasing good clean land for other uses such as housing.



Contributions to SDGs

- Goal 11: Sustainable cities and communities
- Goal 12: Responsible consumption and production

Author(s)/Contact Details

Alice Leney (alice@coolcard.co.nz)

Publisher

J-PRISM: The Project for Promotion of Regional Initiative Solid Waste Management, JICA: Japan International Cooperation Agency

Relevant Websites/Resources

Acknowledgments

- SPREP: Secretariat of the Pacific Regional Environmental Programme
- Environmental Protection Agency, the Marshal Islands
- Majuro Atoll Waste Company, the Marshal Islands

ANNEX G Country Profile

Solid Waste Management Country Profile

Palau

BACKGROUND

Palau has a population of 17,661¹ according to the 2015 census, of which about 65% reside in Koror State and 30% in the 10 states of nearby Babeldaob Island, which is located adjacent to Koror across the sea. The land area is about 458 square kilometers, most of which is occupied by the island of Babeldaob. Palauans make up 73% of the population; the rest are foreign residents in Palau. The GNI per capita is USD 17,280² and the main industries are construction, tourism, and commerce based on the import of food and consumer goods³.

INSTITUTIONAL ASPECTS

Laws and regulations on waste management in Palau are as follows.

- Environment Quality Protection Act 1981 - RPPL No. 1-58
- Solid Waste Management Regulations (2013)
- Recycling Act 2006 - RPPL No. 7-24
- Beverage Container Recycling Regulation 2009
- Plastic Bag Use Reduction Act 2017 - RPPL No. 10-14

A National Solid Waste Management Strategy (NSWMS) has been developed as follows:

- National Solid Waste Management Strategy: The Roadmap towards a Clean and Safe Palau 2017 to 2026

At the national level, the Bureau of Public Works (BPW) under the Ministry of Public Infrastructure and Industries (MPII) is responsible for the overall management of municipal waste and the Environmental Quality Protection Board (EQPB) is the agency responsible for hazardous waste. The waste management operations in each of the 18 states in Palau are the duty of the state governments. Operations and management of the final disposal site located in Koror State, the largest state in the country, and the supervision of the Container Deposit Scheme (CDS) for beverage containers are carried out by BPW.

TECHNICAL ASPECTS

Waste Generation and Composition

According to the NSWMS 2017-2026, the amount of waste generated per day in Koror and the 10 states in Babeldaob, categorized by source, is as shown in the table below. Approximately one-third of the waste is household waste and the remaining two-thirds is other waste.

Waste generated in Palau (tons/day)

Source of Waste	Waste Generated (tons/day)
Household	11
Other sources	23
Municipal waste total	34

Source: National Solid Waste Management Strategy (NSWMS) 2017-2026

In addition, as shown in the NSWMS 2017-2026, a waste flow was created based on an SWM baseline survey, and the waste flow revealed not only the amount of waste generated, but also the amount discharged, and the final disposal amount. In Palau, recycling activities, such as the CDS for beverage containers and composting of organic waste, have been working effectively, which contributes to reducing the final disposal amount.

Volume of waste managed by waste management services in Palau (tons/day)

Amount Generated	Amount Discharged	Final Disposal Amount
34	29	29

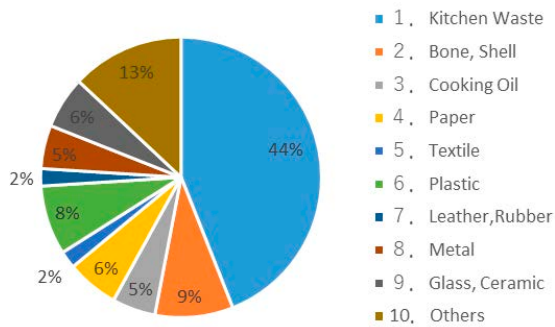
Source: National Solid Waste Management Strategy (NSWMS) 2017-2026

With regard to the composition of household waste, it was found from surveys conducted in 2014 and 2015⁴ that kitchen waste accounted for the largest proportion at 44%, as shown in the figure. However, most kitchen waste is efficiently utilized as livestock feed and composting material.

SWM Country Profile



Waste Composition of Household Wastes in Koror (Weight %)



Source: National Solid Waste Management Strategy (NSWMS) 2017-2026

Waste Collection

Household waste in Koror is collected by the waste management division of the state government using four compactor trucks and open-top trucks, working five days a week, and each household is provided with a weekly collection service. Residents discharge waste in drums placed on the roadside in front of their houses, where it is collected by collection vehicles driving along the road. This system works on a door-to-door basis and the collection rate is estimated to be 100%.

For the 10 states of Babeldaob, previously each state government provided a collection service and transported waste to small-scale dump sites located in the states. With the use of the new national landfill site in Aimeliik, BPW started the inter-state collection to serve 10 states of Babeldaob since February 2021.



Waste collection using a compactor truck in Babeldaob (2019)

Waste Disposal

Until February 2021, Koror State and some of the states in Babeldaob had transported their waste to M-Dock landfill site located in Koror State. It had been in use for more than 50 years, utilizing a low-lying area along the coast.

Since this area was adjacent to a boat slip which had a lot of tourist traffic, the structure was designed with consideration for the surrounding environment: the landfill waste had been hidden within an embankment so that no waste was visible from the surrounding area. A leachate treatment pond had also been installed, and was designed to circulate back to the disposal site as needed, thereby avoiding discharge in the vicinity. The embankment was built up higher in 2007 and 2017, and as of 2020, waste was being deposited in the third tier. Approximately 27 tons of waste had been delivered every day to the M-Dock landfill site, of which about 30% was from households and the rest was from businesses such as hotels and restaurants, or was construction waste. While no fees had been charged for disposal of the waste, BPW, a national agency, was responsible for the landfill operation at M-Dock landfill site.



An aerial view of the M-Dock landfill site (2019)

With grant assistance from Japan, a new landfill site was constructed in Aimeliik on the island of Babeldaob, and has been in use since February 2021. At present, waste from the state of Koror, where 65% of the population lives, and waste from the 10 states of Babeldaob, is being disposed of at this new national landfill site in Aimeliik.



The new landfill site in Aimeliik (2022)

SWM Country Profile

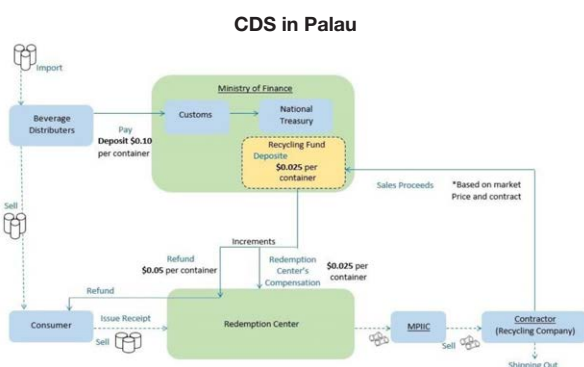


Recycling

When it comes to recycling in Palau, the success of the CDS has been noteworthy; however, many other recycling activities are also conducted under the leadership of the recycling center. Major recycling activities are outlined below.

1) Container Deposit Scheme (DS)

The CDS, in place since 2011, charges a deposit of 10 cents per beverage (in aluminum cans, steel cans, plastic bottles, or glass bottles) upon import of the beverages and refunds 5 cents per empty container brought to designated redemption centers, as seen in the diagram below.



Source: Beverage Container Recycling Program Annual Report FY-2020

Since the introduction of this system, the collection rate for eligible containers has remained high, with an average collection rate of 87.3% from 2011 to 2016.

Number of containers and redemption rate under CDS

Year	No. of Containers Subject to Deposits	No. of Containers Redeemed	Redemption Rate
2011	6,663,590	0	
2012	14,386,027	18,925,157	131.6%
2013	15,459,266	15,369,174	99.4%
2014	15,618,616	14,678,332	94.0%
2015	17,687,328	13,694,907	77.4%
2016	18,554,552	14,491,490	78.1%
Total	88,369,379	77,159,060	87.3%

Source: Annual report on CDS (2018) issued by waste management section of BPW

Of the 5-cent difference between the deposit and the refund, 2.5 cents is paid to the contractor for the operating costs of the redemption center. The remaining 2.5 cents is used by BPW to cover costs for waste management, such

as operating the disposal facility.



Collected aluminum cans and compression equipment in the recycling center in Koror (2018)

2) Composting

Since 2009, the recycling center operated by Koror state government has been composting waste such as green waste, cardboard, and kitchen waste discharged from hotels and other businesses. About 500 kg of waste per day is converted into compost, which contributes to a 2% reduction in the amount of generated waste. The compost produced in the facility is offered for sale to those who wish to purchase it.



Compost yard, and green waste for use as a raw material (2018)

3) Glass Bottle Recycling

Glass bottles are not reused in Palau, where no beverage manufacturing industry exists. Instead, glass bottles collected via the CDS are crushed into small pieces to be used as construction materials, or melted as raw materials for glass crafts so that tourists and others can experience the glass craft manufacturing process.

SWM Country Profile



Glass factory in Koror (2022)

4) Others

At the both of the M-Dock landfill site and the national landfill site in Aimeliik, scrap vehicles are dismantled and sorted into different materials, such as scrap metal, copper, and aluminum, which are exported by a private contractor.

FINANCIAL ASPECTS

Waste management in Palau is implemented without charging households and businesses fees for waste collection and disposal, as of June 2022. The operational costs of the waste management section of BPW, which manages the disposal site and educates residents on recycling activities, are entirely covered by 25% of the CDS deposit, thereby avoiding any reliance on the national budget.

The Koror government covers about 70% of the necessary expenses from the state budget and the remaining 30% from the operating revenue of the CDS redemption center.

LOCAL AREAS

Palau has 16 states in total, and 95% of its population resides in Koror and the 10 states of Babeldaob. The remaining 5% live in the other five states on remote islands, the most populous of which is Peleliu Island, with 484 people. The state government in Peleliu provides a waste collection service using vehicles that include collection vehicles donated by the Japanese government through Grant Assistance for Grassroots Human Security Projects. However, the situation at the landfill is far from ideal, as landfill compaction is rarely undertaken due to a lack of heavy machinery.

As Peleliu's landfill situation indicates, waste management on the remote islands of PICs is extremely difficult. However, at the same time, Peleliu offers a valuable exam-

ple of cooperation with a national CDS program to introduce recycling activities on a remote island, reducing beverage container disposal and littering.

CONCLUSIONS

In general, waste management has been properly implemented in Palau, making effective use of abundant financial resources and foreign assistance. Thus, it is important to maintain such proper waste management continuously.

Construction of a new disposal site and smooth transition

In November 2020, a new final landfill site was constructed in Aimeliik on the island of Babeldaob using Japanese grant aid. Since its operation in February 2021, all the waste from Koror, which used to be disposed of at the M-Dock landfill site, and the waste from the 10 states in Babeldaob, which used to be disposed of at several small-scale disposal sites in Babeldaob, is being transported to this site for sanitary disposal. The existing small disposal sites operated by state governments are slated to be closed due to improper operation and management, which is expected to contribute to improving sanitary conditions on Babeldaob Island.

Inter-state collection on Babeldaob island

On Babeldaob Island, where the new landfill site was constructed, a unified collection and disposal system was successfully introduced by transitioning from individual waste collection and disposal by each state government to inter-state collection by a private contractor under the responsibility of BPW. Although the distances waste is transported will become longer, the new system is expected to improve collection efficiency and make the most of a private company.

Proper closure of the M-Dock landfill site

The M-Dock landfill site, used for 50 years, is to remain as a disposal site for residual waste from recycling activities in Koror. Once the third embankment currently in use is fully filled, the site is scheduled to be properly closed and utilized as an asset of the Koror state government. As it is adjacent to the tourist boat slip in Koror, effective use of the site as a park with an observation deck is being considered.

Securing financial resources

As mentioned above, Palau has maintained its beauty as a tourist destination without imposing a disposal fee on those who generate waste, using the abundant

SWM Country Profile



revenue from tourism and the CDS. However, in order to properly manage the new landfill site as well as implement sound waste management, it is important to secure sustainable financial resources. From this perspective, therefore, the necessity of charging disposal fees at the new landfill site has been discussed in line with the polluter-pays principle.

REFERENCE

1. National Solid Waste Management Strategy: The Roadmap towards a Clean and Safe Palau 2017 to 2026

<https://www.sprep.org/publications/national-solid-waste-management-strategy-the-roadmap-towards-a-clean-and-safe-palau-2017-2026>

¹ 2015 Census of Population, Housing and Agriculture for the Republic of Palau

² World Bank, 2018

³ Basic Data for Palau, Ministry of Foreign Affairs of Japan

⁴ Feasibility study on comprehensive resource circulation system for low carbon society in Republic of Palau by AMITA Institute for Sustainable Economies Co., Ltd. under "Feasibility Studies on Joint Crediting Mechanism (JCM) Projects towards Environmentally Sustainable Cities" of Ministry of Environment, Japan.

August 2022



Contact Us:

J-PRISM II Project Office

Office: c/o P.O. Box 240, Secretariat of the Pacific Regional Environment Programme (SPREP), Apia, Samoa

Telephone: (685) 21929 (ext. 324),

Website: <https://www.sprep.org/j-prism-2/home>



SPREP
Secretariat of the Pacific Regional
Environment Programme

Solid Waste Management Country Profile

Federated States of Micronesia

BACKGROUND

The Federated States of Micronesia (FSM) consists of four states, Pohnpei, Chuuk, Kosrae, and Yap, and covers an area of 700 square kilometers. The capital, Palikir, is located in the state of Pohnpei. According to the 2010 census, the total population of the four states in that year was 102,843, of which 36,196 were in Pohnpei, 48,654 were in Chuuk, 6,616 were in Kosrae, and 11,377 were in Yap¹. Gross national income (GNI) per capita in the FSM was estimated at USD 3,400^{2,3} in 2018. While export value reached only USD 136.5 million, import value was USD 653.3 million⁴, indicating that the FSM depends upon imports for most of its necessities, and the trade balance is constantly in the red.

INSTITUTIONAL ASPECTS

The FSM has three administrative layers: national, state, and local government. At the national level, the Department of Environment, Climate Change and Emergency Management (DECEM) is responsible primarily for drafting national environmental policies and coordinating among state environmental departments. Actual waste management is carried out by the state agencies in each state based on the state codes.

State of Yap

The following are major regulations governing waste management in Yap⁵:

- Recycling Program Regulations 2014
- Plastic Bag Prohibition Regulations 2014
- Solid Waste Management Regulations 2015
- Hazardous Substance Regulations 2015

Promotion of environmental policy, environmental education, and recycling are carried out by the Yap Environmental Protection Agency (Yap EPA). On the other hand, the operation and management of waste collection, transportation, and disposal are carried out by a private company under the supervision of the Department of Public Works and Transportation (DPW&T). In Yap, a beverage

container deposit scheme has been introduced, and is operated sustainably. A private company commissioned by Yap EPA is responsible for the recycling activities.

State of Chuuk

The major laws related to solid waste management are compiled in the Chuuk State Code as seen below⁶:

- Title 21, Chapter 13: Sanitation Act
- Title 22, Chapter 1: Chuuk State Environmental Protection Act
- Title 22, Chapter 3: Littering Act

As a recent development, the Clean Environmental Act 2018 CSL No.14-18-20, which includes a clause prohibiting plastic shopping bags, was passed at the state legislature in 2018.

Chuuk Environmental Protection Agency (Chuuk EPA) is in charge of environmental policy planning and environmental education, while the Department of Transportation and Public Works (DT&PW) is in charge of waste collection and transportation, and operation and management of the disposal site.

State of Pohnpei

As seen below, the major laws related to solid waste management are compiled in the Pohnpei State Code⁷:

- Title 27, Chapter 1: Pohnpei State Environmental Protection Act
- Title 27, Chapter 2: Littering in Public Places and Premises
- Title 27, Chapter 3: Beverage Container Recycling
- Title 27, Chapter 4: Prohibition of Importation and Use of Single-Use Plastic Bags

Pohnpei Environmental Protection Agency (Pohnpei EPA) is responsible for planning environmental policies, and promoting environmental education and recycling. A private company is responsible for operation and management of the landfill site under the supervision of the Office of Transportation and Infrastructure (T&I). Waste collection and transportation is carried out by each municipality.

SWM Country Profile



State of Kosrae

In Kosrae too, the related laws are compiled in the Kosrae State Code⁸:

- Title 19, Chapter 5: Hazardous Substances and Pollution
- Title 19, Chapter 6: Waste Management and Recycling
- Title 11, Chapter 9: Control of Plastic Wastes

Kosrae Island Resource Management Authority (KIRMA) oversees environmental policy, environmental education, and promotion of recycling. Meanwhile, the Department of Transport and Infrastructure (DT&I) manages waste collection, transportation, and operation of the disposal site. In Kosrae, beverage container deposit scheme has been introduced, and is operated sustainably. A private company commissioned by KIRMA is carrying out the recycling activities.

Solid Waste Management Strategies

State Solid Waste Management Strategies (SSWMSs) have been formulated in each of the four states and approved by their governors⁹. Under these strategies, four common principles have been adopted: i) establish financially sustainable SWM systems with due consideration of “Post 2023”, the end of financial assistance from the US, ii) reduce waste amount through maintaining current practice of using kitchen waste as feed for animals and/or by improving the existing beverage container recycling system, iii) capacity building of human resources for waste management, and iv) Commitment to the clean and beautiful pacific region achieving the clean and beautiful Pacific region.

TECHNICAL ASPECTS

Waste Generation and Composition

In each state of the FSM, about two-thirds of daily waste generated comes from households, while the remaining one-third comes from other sources.

Waste generated in the FSM (tons/day)

State	Waste Generated (tons/day)		
	Household waste	Other sources	Municipal waste total
Pohnpei	30	16	46
Chuuk	8	5	13
Kosrae	5	2	7
Yap	6	3	9

Source: Solid waste management strategies formulated by each state

Based on surveys of current circumstances, waste flows were developed in all states, which quantitatively revealed the actual situation and clarified the issues with regard to waste management. The amount of solid waste generated is highest in Pohnpei at 46 tons per day, followed by Chuuk at 13 tons per day, Yap at 9 tons per day, and Kosrae at 7 tons per day. Since raising livestock (mainly pigs) with kitchen waste as feed is a traditional practice in the FSM that remains common, most kitchen waste is recycled. In each state, approximately 80% of discharged waste is disposed of. It should also be noted that a considerable amount of waste is brought to the landfill sites by residents themselves, which is a characteristic common to all four states in the FSM.

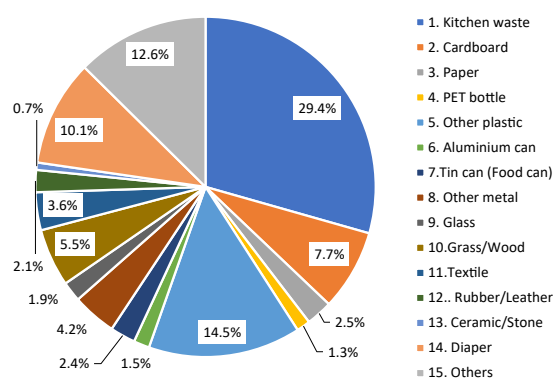
Volume of waste managed by waste management services in the FSM (tons/day)

State	Generated	Discharged	Disposed
Pohnpei	46	30	23
Chuuk	13	10	8
Kosrae	7	5	4
Yap	9	7	6

Source: Solid waste management strategies formulated by each state

The composition of household waste by weight is as follows: kitchen waste comprises the highest percentage at 30%, followed by plastics including PET bottles at 16%, disposable diapers at 10%, and cardboard at 8%.

Composition of Household Waste (weight base)



Source: Solid waste management strategies formulated by each state

In addition, it is impossible to ignore the challenges imposed by some difficult-to-manage types of waste, which are not captured by the waste composition survey for households. The FSM has a significant problem with

SWM Country Profile



end-of-life vehicles, old tires, and dumping of waste on seashores. Discarded heavy equipment is often dumped on reef flats. Although the quantity of such waste has not been fully ascertained, it is a common waste management challenge for many island states.

Waste Collection

Each state of the FSM is actively utilizing various forms of assistance from the Japanese government to acquire waste collection vehicles, covering waste collection costs with the state/ municipality's own financial resources or with collection fees, in order to provide a waste collection service to its residents.

State of Yap

Currently, the waste collection service in Yap is provided only to public institutions such as schools, hospitals, and government offices in the Colonia area through a private company contracted by DPW&T. Waste from other sources in the Colonia area is collected by private collection companies that have contracts with business establishments and households. In addition, Tamil municipality, one of the 11 municipalities on Yap's main island, has set up waste collection stations in individual villages since 2017, aiming to close dump sites run by the municipality itself. A private collection company contracted with the villages has started collecting waste at waste collection stations in return for a waste fee charged to residents. Waste collected by the state government accounts for only 14% of the amount generated and 21% of the amount discharged, which is the lowest collection rate among the four FSM states. As residents often transport waste to disposal sites themselves, the low rate of collection by the public sector does not lead to illegal dumping. However, the relevant state agencies are considering expanding the collection area covered by the government.

State of Chuuk

The state code defines waste management as a role of DT&PW; however, there is no section dedicated to SWM in DT&PW. Garbage collection is provided by a combination of "station collection" and "horn collection." Station collection is a method whereby businesses and residents discharge their waste to a waste collection station installed along the main road in a densely populated area, whereas horn collection is a method whereby the garbage collection truck's horn is sounded to notify the residents of its arrival in an

area where houses are scattered. Garbage collection using both methods provides a good overall collection service, with a public sector collection rate of about 50% of discharge, which is higher than in other states. However, challenges still remain in the eastern half of Weno Island, the central island of the state, where collection services cannot be provided due to poor road conditions and no waste collection fee is charged. Elsewhere in the state, an even more efficient collection service has started since the Japanese government provided two 4-ton compactor trucks in 2019.

State of Pohnpei

On the main island of Pohnpei, the six local governments (one town government and five city governments) collect municipal waste mainly using 4-ton compactor trucks provided by the Japanese government through grant aid. The collection rate for all six local governments is estimated to be about 20% of waste discharged. The collection systems differ from one local government to another, including regular collection on a fixed day of the week, and paid-for collection, which is provided only to those who have paid the garbage fee. Furthermore, many households are accustomed to storing their waste in their premises until "cleanup days," held several times a year, when no waste collection fee is required. This causes not only public health issues, but also aesthetic issues; thus, waste collection is one of the main areas of waste management to be improved in Pohnpei.

State of Kosrae

Kosrae consists of four municipalities, each of which was supposed to provide waste collection and transportation services to its residents. However, municipalities with fragile finances have been unable to provide regular collection, and illegal dumping has been found in such areas. Following the provision of a 4-ton compactor truck through the grant aid from the Japanese government, the relevant organizations (KIRMA, DT&I, and the four municipalities) held a series of discussions, and with the technical support of J-PRISM II, an Inter-Municipal Collection System (IMCS) was introduced.

SWM Country Profile



The Inter-Municipal Collection System shortly after its introduction (2020)

In order to implement this inter-municipal collection, the state code was revised to make DT&I responsible for waste collection, a financial mechanism was created to share the cost of collection among the state and the four municipalities, uniform collection containers were distributed, and a system was developed to collect waste efficiently. The Inter-Municipal Collection System began in February 2020, and regular weekly collection is now provided to all residents.



Group photo of members of the relevant organizations when the Inter-Municipal Collection System was launched (2020)

Final Disposal of Waste

Three states of the FSM, excluding Chuuk, have set up semi-aerobic landfills, or so-called Fukuoka-Method disposal sites, with the financial support of the Japanese government, and are properly disposing of waste discharged in the islands.

State of Yap

Yap has a state-owned public disposal site built in the

Colonia area with the support of the Japanese government. The landfill site area covers 8,370 m² and is divided into three sections; one is an old section that was used previously, and the other two are newly added sections that were constructed using the Fukuoka Method with the support of the Japanese government. One of the new sections has been in use since 2014, and the water quality of the leachate reservoir is regularly monitored by Yap EPA. For the old section, degassing pipes were installed, and final soil cover was placed over it in 2015 to facilitate safe and stable closure. The new sections were constructed with ancillary equipment such as degassing pipes, leachate collection and circulation equipment, and leachate reservoirs. This disposal site handles 86% of the state's discharged waste and 60% of its generated waste. Meanwhile, several dump sites managed by local communities still remain in Yap; in order to close these dump sites, improvement of collection throughout Yap's islands would be advisable.

State of Chuuk

Since 2016, waste discharged on Chuuk's Weno Island has been disposed of at a waste dump site near the port—commonly known as the Marina Interim Dump Site—due to the closure of a former disposal site. In the state as a whole, 77% of discharged waste and 58% of generated waste is brought to this dump site, but due to restrictions on the use of the site, it is not possible to increase the level of waste any further. Accordingly, the state government has secured 1,600 square meters of landfill area on the former disposal site, aiming to use it as another interim waste disposal site until a new landfill site is developed. Given that construction of a new landfill site is essential to address the waste management issue in Chuuk, an environmental impact assessment (EIA) is currently underway at a proposed site.

State of Pohnpei

In the island of Dekehtik, along the road from the airport to the city, there is a 4-ha public disposal site owned by the state government. The operation and maintenance of the disposal site is carried out by Pohnpei Waste Management Service (PWMS), a private company commissioned by T&I, an agency of the state government. In Pohnpei, 75% of discharged waste and 50% of generated waste is disposed of at this site. Of this waste, 54% is brought in by residents and shop workers themselves, 27% is collected by the city government, and 19% is collected by the private compa-

SWM Country Profile



ny (PWMS). With the technical support of J-PRISM II, this disposal site adopted the Fukuoka Method in 1997, incorporating environmental measures such as the installation of leachate collection equipment and an oxidation pond¹⁰ in the first cell, and started operation. Since the first cell became full in 2018, PWMS used Compact funding from the US to construct a second cell based on the experience it had gained from the first cell, and it is currently using this second cell.

State of Kosrae

Kosrae has a state-owned public disposal site of about 0.6 ha in the village of Tofol in Lelu Municipality. This disposal site was the first in the FSM to apply the Fukuoka Method, and landfilling started in 2009. With the support of the Japanese government, its construction included a gas ventilation pipe, leachate collection equipment, and sewage circulation equipment. As part of the disposal site's management, surface compaction is undertaken several times each month using heavy machinery. Also, the types and amounts of waste, and their origins by types of vehicle, are regularly recorded as a means of waste control.



Aerial photo of the public disposal site in Kosrae (2019)

Recycling

In the FSM, Container Deposit Schemes (CDSs) for beverage containers are gaining ground. A CDS is a system whereby a small extra deposit is added on top of the retail price when eligible beverages are sold. The deposit is partly refunded when the empty beverage container is returned to a redemption center.

The reason that CDSs are gaining ground in the FSM is that the products covered by this system are not manufactured in the states. They are all imported products, and thus it is relatively easy to charge a deposit at the time of import. Among collected containers, aluminum cans are regularly exported owing to their high resource value,

which also contributes to material recycling. However, for other beverage containers (mainly plastic bottles), all the states are experiencing difficulties in securing export destinations due to the sluggish recycling market for plastics.

State of Yap

The Container Deposit Scheme in Yap was launched in 2003 with the support of the United Nations Development Programme (UNDP). Under the state's CDS law, the Island Paradise Recycling Company, which operates a redemption center, has been responsible for recycling activities since the beginning of the system under a contract with Yap EPA. The CDS targets aluminum beverage containers/cans, glass beverage bottles, plastic beverage containers, and cooking oil containers. The deposit is 6 cents per container, of which 5 cents is refunded to the consumer and 1 cent is paid to the redemption center operator as the operating fee and commission. As in other states, it is difficult to secure export destinations for recovered resources other than aluminum cans.



A recycler who operates the redemption center in Yap (2019)

State of Chuuk

In Chuuk, a Container Deposit Scheme existed for specific beverage containers in 1979, even before the FSM gained its independence, but it is no longer operational. Now, with J-PRISM II's assistance, recycling laws are being revised and the Japanese government is supporting the installation of can pressing machines in order to re-introduce the CDS.

State of Pohnpei

The Container Deposit Scheme in Pohnpei was launched in August 2012, based on the related chapter of the Pohnpei State Code, pertaining to the recycling of bev-

SWM Country Profile



erage containers. In 2016, this chapter was amended to make importers pay deposits on import, instead of retailers paying deposits on the first retail sale. Only aluminum beverage cans are eligible. The deposit fee paid by importers is 6 cents per can, of which the refund to consumers who take containers to the redemption center is 5 cents per can, and the remaining 1 cent is paid to Kolonia Town Government (KTG) and Madolenihmw Municipal Government (MMG) as an operating fee. At present, the CDS in Pohnpei is operated in such a way that the redemption center is run by Pohnpei EPA in collaboration with KTG and MMG; however, it will be necessary to consider entrusting the operation of the redemption center to a private company, like in Yap and Kosrae, as described later. Furthermore, KTG and MMG own the redemption center, but it is small and the capacity of its pressing machine is very limited, so beverage containers are accepted only about once every few months. Currently, with the support of Japan, the procurement of a large can pressing machine and construction of a new redemption center are in progress. The new redemption center is being constructed on the premises of the disposal site. The plan is to revise the CDS-related law (to add new target items) and privatize the recycling business in conjunction with the start of operations at the new redemption center.

State of Kosrae

Kosrae's Container Deposit Scheme was started with the support of the UNDP in accordance with the Recycling Program Ordinance enacted in 2007, and is operated and managed under KIRMA's supervision. Kosrae's CDS covers aluminum cans, glass bottles, plastic bottles for beverages, and car batteries. Importers pay a 6-cent deposit per container (USD 4 per car battery). Then products are sold at retail stores for a retail price including the deposit. After the products are consumed, consumers take the empty containers or batteries to the redemption center to receive a refund of 5 cents per container (or USD 3 per car battery). The difference covers the operation cost of the redemption center. In Kosrae, which has the smallest population and economy among the four states, it is very difficult to operate and maintain the redemption center with the difference of only 1 cent. Therefore, the ordinance is currently being amended to set the deposit at 7 cents per container in order to contribute 2 cents per container toward operation costs. As mentioned earlier, it is difficult to secure export destinations for collected resources except for aluminum cans, and they are currently stored in the redemption

center. The beverage container collection rate (total number of refunds/total number of deposits) reached almost 90% each year between 2015 and 2017.



Residents in Kosrae bringing empty beverage containers on the weekly recycling day (2018)

FINANCIAL ASPECTS

The country's economy is highly dependent on financial support from funding based on the Compact of Free Association with the US (US Compact funds). This funding includes the Small Sector Grant (Environment), which has been used for waste management in each state; however, the rules regarding use of the Small Sector Grant were changed in 2019, requiring each state to undertake difficult adjustments.

State of Yap

In Yap, waste collection in the Colonia area had been covered by the Small Sector Grant (Environment) until it was cut back. Now state funding is used for this purpose. On the other hand, private waste collection is carried out on a village-by-village basis in some communities, and the cost is collected from residents as a waste collection fee.

State of Chuuk

In Chuuk (Weno Island), the Small Sector Grant (Environment) has not been used at all for waste collection or the operation and maintenance of the disposal site, and no waste fees or tipping fees have been collected either. Waste collection and the disposal site have been funded by the state's own financial resources, which are still being used today.

State of Pohnpei

Expenses related to the operation and management of

SWM Country Profile



the disposal site (outsourcing costs) had been covered by the Small Sector Grant (Environment) until 2019, however, since the grant became unavailable, funding has been secured from the state government's budget. For waste collection, two municipalities out of six in Pohnpei cover the cost entirely with their own financial resources. Although the remaining four municipalities have a waste fee system, the fee collection rate is very low, and the municipal governments of Kolonia and Sokehs, which are relatively well funded, supplement the waste fee with their own financial resources to collect waste. The other two municipalities provide collection services only for residents who pay the fee.

State of Kosrae

Previously, operation and maintenance costs for the disposal site were partially covered by the Small Sector Grant (Environment), but now the entire budget is covered by the state government. Collection and transportation are funded by the state government's budget as well as contributions from the four municipalities.

CONCLUSION

Securing and maintenance of garbage collection vehicles

Since the life of collection vehicles is relatively short in these islands, where salty wind blows, both proper vehicle maintenance and regular replacement are required. However, it is difficult for the national and state governments to procure vehicles with their own financial resources, so vehicles need to be acquired systematically using grant aid schemes such as those from the Japanese government. It is also necessary to utilize assistance from international donors to provide vehicle maintenance training to enable appropriate maintenance skills to be acquired.

Securing financial resources for waste management (collection and transportation)

From the viewpoint of public health and environmental protection, it is desirable to provide waste collection equally to as many residents as possible. In order to continue or expand regular collection, it is necessary to secure sufficient financial resources, but state and local governments are having difficulty in securing financial resources. In each state, local governments tend to collect waste fees from residents who generate waste, but the collection rate remains low despite the substantial

work required to collect the fees. In order to improve this situation, it would be advisable for the FSM to consider collecting disposal fees from businesses that discharge large amounts of waste and/or levying special taxes on imported products that have a significant impact on the environment. It is necessary to consider methods of securing financial resources that suit the actual circumstances of the country. Furthermore, there is an urgent need to consider measures such as collecting tipping fees from large-scale dischargers who bring their waste to disposal sites themselves.

Management of final disposal sites

In many states, Fukuoka-Method disposal sites have been established with the support of the Japanese government, and efforts are being made to ensure appropriate waste management. At the disposal sites, where waste arrives constantly, it is important to monitor conditions regularly and estimate remaining disposal capacity. Furthermore, all four states of the FSM need to plan for new landfill sites well in advance, as suitable land is scarce.

Continuation of recycling activities

As mentioned earlier, CDSs are widely implemented in many states, but the sluggish recycling market makes it difficult to export resources other than aluminum. Even under such circumstances, continuation of the CDSs remains meaningful in terms of preventing the beverage containers from becoming waste and taking up valuable space in landfill, or ending up scattered around the island. Until the resource market recovers and exports can be resumed, it is essential to store the collected resources in a corner at disposal sites or redemption centers in order to protect the environment.

REFERENCES

1. Pohnpei State Solid Waste Management Strategy 2020–2029
<https://www.sprep.org/publications/pohnpei-state-solid-waste-management-strategy-2020-2029-action-plan-2020-2024>
2. Chuuk State Solid Waste Management Strategy 2019–2028
<https://www.sprep.org/publications/chuuk-state-solid-waste-management-strategy-2019-2028>
3. Kosrae State Solid Waste Management Strategy 2018–2027

SWM Country Profile



<https://www.sprep.org/publications/kosrae-state-solid-waste-management-strategy-2018-2027>

4. Yap State Solid Waste Management Strategy 2018–2027

<https://www.sprep.org/publications/yap-state-solid-waste-management-strategy-2018-2027-action-plan-2018-2022>



¹¹ FSM 2010 Census of Population and Housing

¹² World Bank, 2018

¹³ USD 1 = JPY 104.45 (November 2020, JICA)

¹⁴ Asian Development Bank, 2018

¹⁵ <http://fsmlaw.org/yap/index.htm>

¹⁶ <http://fsmlaw.org/chuuk/index.htm>

¹⁷ <http://fsmlaw.org/pohnpei/index.htm>

¹⁸ <http://fsmlaw.org/kosrae/index.htm>

¹⁹ Pohnpei State Solid Waste Management Strategy 2020–2029

<https://www.sprep.org/publications/pohnpei-state-solid-waste-management-strategy-2020-2029-action-plan-2020-2024>

Chuuk State Solid Waste Management Strategy 2019–2028

<https://www.sprep.org/publications/chuuk-state-solid-waste-management-strategy-2019-2028>

Kosrae State Solid Waste Management Strategy 2018–2027

<https://www.sprep.org/publications/kosrae-state-solid-waste-management-strategy-2018-2027>

Yap State Solid Waste Management Strategy 2018–2027

<https://www.sprep.org/publications/yap-state-solid-waste-management-strategy-2018-2027-action-plan-2018-2022>

¹⁰ A man-made shallow pond designed to treat wastewater through various natural treatment systems, such as decomposition using bacteria and uptake of nutrients by plants.

August 2022



Contact Us:

J-PRISM II Project Office

Office: c/o P.O. Box 240, Secretariat of the Pacific Regional Environment Programme (SPREP), Apia, Samoa

Telephone: (685) 21929 (ext. 324),

Website: <https://www.sprep.org/j-prism-2/home>



SPREP
Secretariat of the Pacific Regional
Environment Programme

Solid Waste Management Country Profile

Republic of the Marshall Islands

BACKGROUND

The Republic of the Marshall Islands (RMI), located halfway between the Philippines and Hawaii, is composed of two chains of low coral islands and atolls. The Ratak Chain in the east comprises 15 atolls and individual islands, and the Ralik Chain to the west comprises 16 atolls and islands. The most recent census was in 2011, when the population was 53,000, but recent indications suggest a stable or falling population, largely driven by migration to the United States. There are two urban areas, Ebeye Island (in Kwajalein Atoll) and Majuro Atoll, which together account for around 75% of the population¹.

The latest economic data, for 2018, indicates a national GDP of around USD 220 million, with a per capita GNI of about USD 4,800² and a growth rate of 2.5%³. The largest industrial economic activity is associated with fishing, conducted mainly by foreign ships under license to the Parties to the Nauru Agreement. A tuna fish-processing plant operates in Majuro, employing about 150 people, and Majuro is the largest tuna transshipment port in the Pacific, which results in large numbers of fishing boats and associated supply ships mooring in Majuro Lagoon.

INSTITUTIONAL ASPECTS

The following are the major regulations governing waste management in the RMI:

- National Environmental Protection Act 1984
- Solid Waste Regulation 1989

In Majuro Atoll and Kwajalein Atoll, highly populated areas in the RMI, waste management plans have been formulated as shown below.

- Solid Waste Management Plan for Majuro 2019-2028
- Kwajalein Atoll Solid Waste Management Plan 2019-2028

The government institution with overall responsibility for waste in the RMI is the Environmental Protection Authority (EPA). The EPA was set up under the National Envi-

ronmental Protection Act of 1984, and under this act, the EPA has basic regulations covering solid waste and landfill operations.

Household waste collections take place on Majuro, and on Ebeye Island in Kwajalein Atoll. On Majuro, the Majuro Atoll Waste Company (MAWC), a state-owned enterprise, collects household and commercial waste; on Ebeye, collection is by the Kwajalein Atoll Local Government (KALGOV). In 2016, the Styrofoam Cups and Plates and Plastic Products Prohibition and Container Deposit Act legislated for a Container Deposit Scheme (CDS) recycling system for beverage containers, and the Recycling Program Regulations 2018, under that act, detail the beverage containers covered by the law, and the rates of deposit and refund. The EPA administers the CDS as the designated Recycling Agent, but contracts a System Operator, MAWC, to operate the recycling system on Majuro. The deposit refund recycling system uses a Special Revenue Fund to hold deposits and pay out refunds, and this is administered by the Ministry of Finance. On the island of Ebeye, KALGOV is designated as the System Operator to manage the redemption center there.

TECHNICAL ASPECTS

Waste Generation and Composition

According to the Solid Waste Management Plan for Majuro 2019-2028 and Kwajalein Atoll Solid Waste Management Plan 2019-2028, the amount of waste generated per day by source in Majuro and Ebeye is as shown in the table below. Due to few major industries existing in either area, as much as 60% of waste is generated by households, and 40% from other sources, on Majuro, while the split is 70% to 30% on Ebeye.

SWM Country Profile



Waste generated in the RMI (tons/day)

State	Waste Generated (tons/day)		
	Household waste	Other sources	Municipal waste total
Majuro	27	17	43
Ebeye	9	4	13

Source: Solid Waste Management Plan for Majuro 2019-2028, Kwajalein Atoll Solid Waste Management Plan 2019-2028

Also, the overall amount of waste generated, as well as the total amount of waste disposed of, in Mauro and Ebeye were revealed by a waste flow created through a baseline survey in line with the solid waste management plans. It should be noted that this baseline survey was conducted in 2017. prior to the launch of the CDS in Majuro in 2018. Thus, the current final disposal amount is estimated to be lower than the one mentioned below.

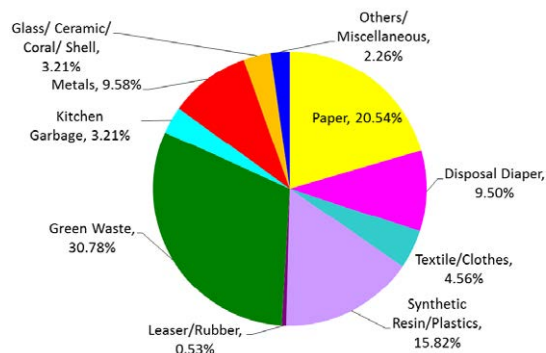
Volume of waste managed by waste management services in the RMI (tons/day)

	Generated	Discharged	Disposed
Majuro	43	35	34
Ebeye	13	11	11

Source: Solid Waste Management Plan for Majuro 2019-2028, Kwajalein Atoll Solid Waste Management Plan 2019-2028

According to the result of the waste composition survey at the final disposal site presented in the Solid Waste Management Plan for Majuro (2019-2028), the biggest component was green waste, which accounted for 31% of waste. Second was paper, accounting for 21%, then plastics at 16%. In fourth place, surprisingly, were disposable diapers at 9.5%. Accordingly, the biggest issue to be solved in order to use the current landfill site longer is reducing the amount of green waste. Note that this survey was carried out at the landfill site, and not at the sources of waste, so the figures represent the composition of waste from all sources.

Waste Composition at Landfill (by Weight) 2017



In addition, we cannot ignore some difficult-to-manage types of waste, which are not captured by the waste composition survey. Majuro has a significant problem with end-of-life vehicles, old tires, and dumping of waste on seashores in an effort to build more land, the waste being used as informal landfill. Disused ships and boats are also common, while discarded heavy equipment is often dumped on reef flats. The Marshalls Energy Company (MEC) usually has over 2 million liters of waste oil stockpiled, and the Ebeye power-plant has over 200,000 liters.

Waste Collection

The two urban centers, Majuro and Ebeye, have regular waste collections. On Majuro, MAWC operates compactor trucks that handle wheelie bins and dumpsters. Wheelie bins are used by two thirds of households in the urban area of Majuro Atoll, which runs from east of the airport along to Rita at the end of the road, and these are emptied once a week by MAWC. In addition, MAWC operates a dumpster service for commercial waste from large-scale retailers and offices, and this is a pay-for-service operation that empties the dumpster on demand. Some businesses haul their own waste to the disposal site, and nominal gate charges are collected depending on vehicle size, not volume of waste. The wheelie bins are large 360-liter units and were supplied through Government of Japan funding in 2012. Collection of waste from the airport to Laura, the rural area of the atoll, is weekly, and based on a blue garbage bag that can be purchased from MAWC. This bag was part of a program initiated by SPREP and PacWaste in 2017.

There is intermittent collection of green waste, and some of this is transported to a facility operated by MAWC at Laura, where a pilot program is in place to make compost. Collection of green waste is mainly conducted on Saturday, when collection services for households and businesses are not provided.

Waste oil can be taken to MEC for disposal, for a charge of USD 1 per liter. Scrap vehicles are not collected, although some smaller scrap metals, such as old roofing, white-goods, and household items are removed from incoming waste and placed on a scrap metal pile at the disposal site.

For Ebeye, KALGOV waste collectors circle the island every two days, emptying wheelie bins and collecting waste, and one day per week go up the causeway to collect from the inhabitants along the way, and at Gugeegue Island, at the end of the road where there is a school and housing.

SWM Country Profile



Local government household waste collection is also noted in the 2011 census for Jabwor Island, Jaluit Atoll, and Kili Island, but what this comprises and where the waste is disposed of is not known.



Waste collection in Ebeye (2017)

Waste Disposal

Majuro has a disposal site at Batkan, which is about halfway between the sea port at Delap and the airport. The site is a controlled disposal site, with a gate and a fence along the adjacent main road. The site is flanked by residential properties. As a result of waste disposal for many years, waste is piled up into a “mountain”—known locally as “Mt. Trashmore”—which at 17 m is the highest point in the country. The waste is tipped from collection vehicles onto a concrete pad, from where it is piled up onto the heap using a tracked excavator of about 12 tons. No compaction takes place due to lack of heavy machinery.



Majuro disposal site (2020)

A small extension to the existing Batkan disposal site is being built across the road from the Batkan site on the

lagoon-side: this extension is piloting a new technique to build lagoon-side landfill using methods developed and successfully used in South Tarawa, Kiribati, with thick concrete walls containing coral sand that acts as a leachate filter. However, the extension of the existing site is merely an interim solution, and construction of a new disposal site for Majuro is urgently required.



Extension to the lagoon-side (2021)

On Ebeye, which is only 36 ha, a controlled disposal site is located at the north end of the island alongside the causeway to Gugeegue, and is fenced on the land-facing sides. This disposal site is largely flat, and some compaction takes place through heavy machinery working the site. Bulky metal waste is put to one side and kept away from the main tipping areas, to facilitate compaction. Ebeye has historically grown in land area through land-filling with waste: the previous disposal site is directly adjacent to the current one, and is now a residential area. There is scope to build a new disposal site on the north side of the existing disposal site, along the causeway, using existing methodology. The current disposal site can be expected to accept waste for another few years. On outer islands, the last census (2011) records the predominate methods of garbage disposal as burying and burning.

Recycling

MAWC is the only permanent recycling operator in the RMI. In 2017, recycling efforts received a major boost when the Japanese government financed a recycling shed through a grassroots grant from the Embassy of Japan. This recycling shed, complete with large baling equipment, has made the introduction of the new CDS recycling system possible. Beverage containers made of aluminum, PET, and

SWM Country Profile



glass are recovered under the CDS system; details are provided below. In addition, MAWC built a composting facility for recycling green waste.

Used lead-acid batteries (ULABs) from vehicles and solar power generation systems are also collected and exported. MEC owns a large number of small Solar Home Systems on outer islands, installed under various donor programs over the last two decades. These yield a number of ULABs, and MEC has exported perhaps 60 tons of the batteries in the last three years. MAWC collects vehicle batteries from the public, buying them at around 30 cents per kilogram, and selling them on to MEC, which fills containers with them for export and sale to Korean buyers under a Basel Permit. Scrap metal is collected in a pile at both the Majuro and Ebye disposal sites, but there is no export of scrap currently. Foreign scrap metal dealers do business from time to time when global prices rise, but high shipping costs are a significant impediment. Some low-level purchase of non-ferrous metals may be ongoing by local agents acting for overseas buyers, usually Korean. A SPREP project did subsidize the export of some scrap from the Batkan site in 2016/17. However, a large barge of scrap metal has been moored in Majuro for the past year, awaiting export - an indication that current scrap prices are far too low to make export economic.

Container Deposit Scheme Recycling

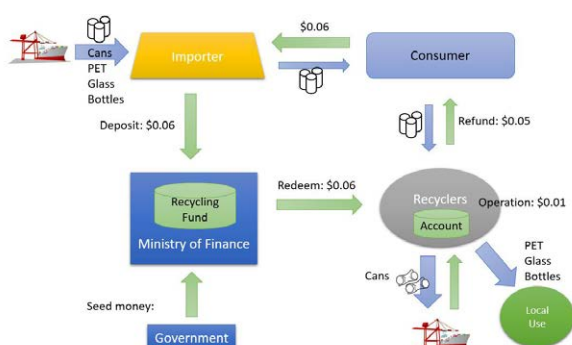
The Marshall Islands has a beverage container recycling scheme that accepts aluminum cans, PET bottles, and glass bottles, all under 1 liter. In 2019 this scheme handled 15 million cans and bottles. The scheme is mandated under container deposit legislation contained in the Styrofoam Cups and Plates and Plastic Products Prohibition and Container Deposit Act of 2016. A 6-cent deposit is paid by the importer for each prescribed beverage when import-

ed, or sold locally in the case of the single local water bottler. The deposits are collected by the Ministry of Finance, or by Customs at the time of import entry, and placed into the Recycling Special Revenue Fund. Once the drink has been consumed, members of the public can redeem their cans and bottles by taking them to the redemption center, where they receive a 5-cent refund (but there is a minimum requirement of 20 units to keep payments to whole dollar amounts). The refund, and the processing of the cans and bottles, is conducted by MAWC as the System Operator contracted by the EPA to run the recycling system. MAWC claims back the entire 6-cent deposit from the Recycling Special Revenue Fund, and by so doing earns itself a 1-cent "handling fee" for each item refunded. Currently, there is only one redemption center, at the Batkan disposal site. Between October 2018 and September 2019, as many as 15,700,000 beverage containers were collected under the CDS. Of the containers collected, aluminum cans accounted for 59% and PET bottles accounted for 40%. The remainder were glass bottles. It is reported that the number of beverage containers littering the streets has decreased significantly, which contributes to improving the level of environmental hygiene.



Collection of beverage containers at the redemption center

The Container Deposit Scheme recycling mechanism



PET bottles are baled, but there is no export market for PET currently, due in part to the previous market in China collapsing, and current low oil prices. A protocol has been developed by EPA to use PET bales as "clean fill" to replace coral sand that has to be mined from the lagoon, in suitable locations where the resulting land is not to be built upon: bales must be buried in sand. Around 300 cubic meters of baled PET are produced each year by MAWC, from around 5.5 million PET bottles. Meanwhile, glass bottles

SWM Country Profile



are smashed and used for internal road treatment in the landfill, as numbers are small at around 150,000 units per annum, and the amount of glass produced is very small once crushed. Glass is of far too low a value to consider for export. However, aluminum cans are crushed in a large baler and sold for around USD 1,000 per ton, depending on global prices. The recycling system exports around 130 tons per year.

Ebeye is in the final stage of setting up a similar CDS operation base at the Ebeye disposal site, with KALGOV as the System Operator contracted to EPA.

FINANCIAL ASPECTS

Under the Compact of Free Association with the United States, the RMI government receives grant funding for various elements of the national budget. For example, in FY2018 this amounted to USD 81.4 million. In addition, that year the government received USD 15.6 million in other US Federal Government grants, and at least USD 23 million from other multilateral donors. Under a Compact Capital Fund Sector Grant, MAWC was allocated USD 1.5 million in the FY2018 appropriations bill for capital improvements; MAWC was also allocated USD 180,000 that year under a Compact Environmental Sector Grant. In addition, MAWC operations are subsidized to a significant degree by the central government of the RMI. In 2018 for example, MAWC received a USD 518,000 contribution from the government for operational expenditures, and a capital grant of USD 457,000; total operational expense for MAWC that year was USD 1.06 million.

The CDS provides income to MAWC through the 1-cent “handling fee” component of the deposit (the difference between the deposit and the refund). This 1 cent provided MAWC with USD 157,000 in 2019, the first full year of operation of the system, and the sale of 9.5 million cans, around 136 tons of aluminum, generated an additional revenue of over USD 100,000. The cans are sold to an Australian company. The CDS recycling operation generates a surplus to MAWC of around USD 100,000 per year, and this is used to support other waste services that MAWC provides to the community of Majuro, and may help relieve pressure on government support payments. MAWC does charge nominal gate fees at the Batkan disposal site, and also charges for commercial dumpster waste collections: these fees brought in an income of USD 112,000 in FY2018.

For Kwajalein, where the waste collections and disposal site are operated by the local government, KALGOV, FY2018 expenditure on SWM was around USD 300,000, of which USD 108,000 was a subsidy from the RMI government.

On Ebeye, no income has been raised from waste management services since the redemption center has not been operated yet under the CDS, and neither collection fees nor disposal fees for waste have been collected.

CONCLUSIONS

The situation with regard to waste management is a mix of some very good developments, with regard to recycling, and some critical needs, such as the landfill situation on Majuro.

Proper final disposal

Appropriate final disposal is an extremely important factor in waste management, but Majuro has many challenges at this final disposal stage. Currently, extension work is underway on the lagoon side of the existing disposal site. This new pilot-scale disposal site will not have much capacity, but it may well show the way forward to a new approach for finding potential landfill sites. If incoming waste can be diverted from the existing landfill site, rehabilitation can then take place that will flatten and compact the site, and so allow more space for recycling and waste diversion operations in the future, as the recycling shed and associated administrative infrastructure are located there. However, due to the limited capacity of the pilot-scale disposal site, further extension works on the ocean side is just initiated, as an interim measure. At the same time as appropriating budget for this interim measure, it is also necessary to start considering a long-term measure, i.e., construction of a new disposal site.

Further efforts for recycling

The RMI is considering extension of the legislated recycling system to other materials that are usually difficult to deal with, such as used cars and tires, etc. Whether the deposit system is appropriate for these items in the first place will need to be examined from a technical perspective. Even if it is decided to include such items in the deposit system, careful consideration will need to be given to such issues as where they should be collected and what to do with the collected items. It is ex-

SWM Country Profile



pected that the RMI will continue to play a pioneering role in this regard, while seriously considering technical aspects.

Financial sustainability

As it is unclear whether the United States will continue to provide financial support to the central government based on the Compact of Free Association, financial sustainability will be required in the field of waste management, as in other areas. The existing arrangements whereby waste collections are free for residents may need to be changed as MAWC and KALGOV shift to a model that makes the better-off, who make more waste as they buy more, pay for the collection service. It must be remembered that this will only be possible if the regulations regarding uncontrolled dumping onto beaches and coasts are improved and enforced at the same time.

REFERENCES

1. Solid Waste Management Plan for Majuro 2019–2028
<https://www.sprep.org/sites/default/files/documents/publications/RMI-Solid-Waste-Management-Majuro-2019-2023.pdf>
2. Kwajalein Atoll Solid Waste Management Plan 2019–2028
<https://www.sprep.org/attachments/VirLib/Palau/eb-eye-solid-waste-management-strategy.pdf>
3. Annual Report to the Nitijela for the CDL Recycling System, 2019

¹ Republic of the Marshall Islands 2011 Census Report

² World Bank, 2018

³ Asian Development Bank, 2018

August 2022



Contact Us:

J-PRISM II Project Office

Office: c/o P.O. Box 240, Secretariat of the Pacific Regional Environment Programme (SPREP), Apia, Samoa

Telephone: (685) 21929 (ext. 324),

Website: <https://www.sprep.org/j-prism-2/home>



SPREP
Secretariat of the Pacific Regional
Environment Programme

ANNEX H J-PRISM II Activity Highlight

J-PRISM II HIGHLIGHTS

Palau



SPREP
Secretariat of the Pacific Regional
Environment Programme



Japanese Technical Cooperation Project for Promotion of Regional Initiative on Solid Waste Management in Pacific Island Countries Phase II (J-PRISM II)

J-PRISM II is the five-and-a-half-year Japanese Technical Cooperation Project for Promotion of Regional Initiative on Solid Waste Management (2017-2022), assisting nine member countries (Federated States of Micronesia (FSM), Fiji, Republic of the Marshall Islands (RMI), Palau, Papua New Guinea (PNG), Samoa, Solomon Islands, Tonga, and Vanuatu) in the Pacific Region in partnership with the Secretariat of the Pacific Regional Environment Programme (SPREP). The project was commenced in February 2017, following the previous phase from 2011 to 2016.

Formulation of National Solid Waste Management Strategy (NSWMS)

With the support of SPREP, formulation of a national strategy was already underway in Palau when J-PRISM II started. However, the strategy being formulated lacked the latest data, so the decision was made to conduct a solid waste management (SWM) baseline survey as in other countries, and reflect the results in the strategy.



The National Solid Waste Management Strategy of Palau, approved by the Minister for Public Infrastructure, Industries and Commerce (2019)



Step 1: Understanding the current SWM situation technically as well as quantitatively

In 2017, officers in charge of waste management at the

Bureau of Public Works (BPW) within the Ministry of Public Infrastructure, Industries and Commerce (MPIIC) worked with J-PRISM II experts to conduct a series of SWM baseline surveys. These included waste amount and composition surveys (WACSS), as well as incoming waste amount surveys at landfill sites, time and motion surveys, and public opinion surveys. The results were summarized as waste flows, which were used to identify the urgent SWM issues and challenges in Palau technically as well as quantitatively and share these among key stakeholders.



BPW officers investigate how residents discharge waste (2017)

Step 2: Incorporating the essential data into the NSWMS and finalizing it

Based on their shared understanding and perception of urgent waste issues and challenges, the key stakeholders updated the NSWMS with the latest data and information, and finalized it. The NSWMS was officially approved by the Minister of the MPIIC on January 30, 2019. (Available on the SPREP website at <https://www.sprep.org/attachments/VirLib/Palau/palau-national-solid-waste-management-strategy.pdf> and <https://www.sprep.org/j-prism-2/report-and-materials>, or via the SPREP Virtual Library at <https://library.sprep.org/>)

J-PRISM II HIGHLIGHTS



Inter-state collection system in Babeldaob

In Palau, a new landfill site was constructed in Aimeliik state on Babeldaob Island with the assistance of Japanese grant aid, and has been used since February 2021. Waste from Koror, where 70% of the population resides, as well as from the 10 states in Babeldaob Island, is now being transported to the new site. Until recently, each state in Babeldaob had its own collection and transportation system, and collected waste was disposed of at small-scale state-run dump sites. However, as such community dump sites had not been properly managed due to lack of heavy machinery, they are now being closed down, which is expected to contribute to improving the hygiene level in Babeldaob. The Solid Waste Management Division of the Bureau of Public Works (BPW-SWM) in MPIIC took the initiative to develop and introduce an inter-state collection and transportation system with the technical support of J-PRISM II.

Step 1: Monitoring collection and transportation in Babeldaob

In order to gain an understanding of collection routes, distances, and times in each state of Babeldaob, Global Positioning System (GPS) data loggers were installed in collection vehicles and the data was analyzed. As a result, it was found that all the states were providing households with weekly collections. Maintaining this level of collection service therefore became a basic requirement for the inter-state collection system as well.

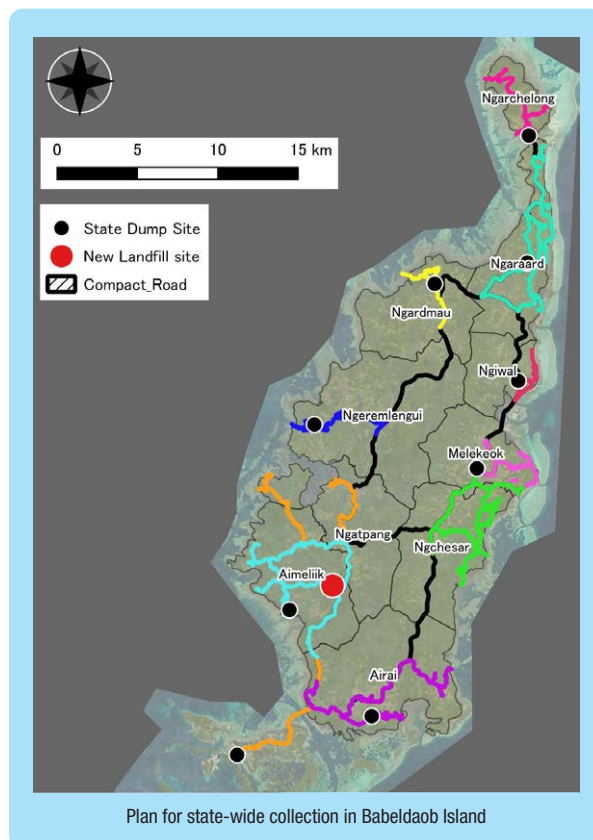
Step 2: Developing an inter-state collection plan and selecting a private contractor

An inter-state collection plan has been developed for the 10 states in Babeldaob, specifying collection routes, collection points, and transportation routes to the new disposal site. The selection of a contractor to collect waste in Babeldaob was based on this plan.

Currently, the contractor regularly collect waste in Babeldaob and transport the collected waste to the new landfill site.

Knowledge-sharing among three countries in the Micronesia region

J-PRISM II is actively promoting the sharing of knowledge and experiences among participating countries. Provision of regional training as seen below is one such effort under J-PRISM II.



Training on landfill management in Palau, February 2018

On-site training on sanitary landfill design and operation using the Fukuoka Method was conducted in Palau by Fukuoka University and the NPO SWAN Fukuoka from February 5 to 10, 2018, in collaboration with J-PRISM II.

JICA has been conducting a training program in Japan named "Design and Maintenance of Semi Aerobic Landfill Site (Fukuoka Method)," and representatives from Pacific Island Countries have been participating in the training every year. The training in Palau was designed as follow-up training for previous participants in JICA's landfill training in Japan, but landfill management officers who had no experience of the training in Japan were also able to attend the training this time. Of around 30 participants from the Micronesia region, more than 20 officers were from Palau, and many of them were from BPW. They were trained by Japanese experts headed by Professor Matsufuji of Fukuoka University, and gained technical knowledge, alongside brushing up their landfill operation skills, through a half-day seminar and four days of on-site training. Utilizing skills and knowledge gained from the training, participants have subsequently dedicated themselves to improving the management of disposal sites in each country.

J-PRISM II HIGHLIGHTS



Demonstrating how to make a drainage pipe from used tires (2018)

Disaster waste management (DWM) workshop in Palau, February 2019

Senior officials from 16 states of Palau attended the regional consultation workshop conducted from February

18 to 20, 2019 at the Koror State Constitutional Hall. It was one of two regional stakeholders' consultations for the development of the regional DWM guideline conducted by J-PRISM II in collaboration with SPREP and the Japanese team that developed the Disaster Waste Management Guideline for Asia and the Pacific. The workshop represented a change of tactic, whereby officials from both waste management agencies and disaster management agencies were invited to attend from Palau, the Federated States of Micronesia, and the Republic of the Marshall Islands in an effort to promote the working relationship between these two key DWM stakeholders. The status of DWM in Palau was jointly presented by officers of BPW, the National Emergency Management Office, and Koror State. The presentations provided crucial information for the purposes of regional DWM guideline development.

¹ <https://www.env.go.jp/press/files/jp/110165.pdf>

About Us: J-PRISM II in Palau

In Palau, day-to-day activities have been conducted in line with the project framework below in close cooperation with the counterpart agencies:

- Ministry of Public Infrastructure, Industries and Commerce (MPIIC)
- Bureau of Public Works-Solid Waste Management (BPW-SWM)
- Koror State Government-Solid Waste Management (KSG-SWM)

Country Activities in Palau

Purpose	With a view to commencement of a new landfill site, a solid waste management system is improved.
Output 1	New NSWMS and its action plan prepared in line with the Cleaner Pacific (2016-2025) are officially submitted to the Minister.
Output 2	Good practices of solid waste management /3R ² are promoted in country and the region.
Output 3	Waste collection is improved in 10 states of Babeldaob Island and in Koror.
Output 4	Transition from M-dock landfill to a new landfill is appropriately carried out.

All the member countries are also assisted under the regional project framework to enhance the regional monitoring mechanism, south-to-south cooperation, disaster waste management, and the 3R+Return system in the region.

Regional Activities including Palau

- Output1: Monitoring mechanism for solid waste management in line with Cleaner Pacific 2025 is strengthened
- Output2: Regional cooperation is organized and promoted by utilizing regional human resource and sharing good practices in the region
- Output3: Regional capacity of disaster waste management is strengthened
- Output4: Practical and sustainable 3R+Return system is examined

² Reduce, Reuse, and Recycle

Contact Us:

J-PRISM II Project Office

c/o P.O. Box 240, Secretariat of the Pacific Regional Environment Programme (SPREP), Apia, Samoa
Telephone: (685) 21929 (ext. 324), Website: <https://www.sprep.org/j-prism-2/home>

J-PRISM II HIGHLIGHTS

Federated States of Micronesia



SPREP
Secretariat of the Pacific Regional
Environment Programme



Japanese Technical Cooperation Project for Promotion of Regional Initiative on Solid Waste Management in Pacific Island Countries Phase II (J-PRISM II)

J-PRISM II is the five-and-a-half-year Japanese Technical Cooperation Project for Promotion of Regional Initiative on Solid Waste Management (2017-2022), assisting nine member countries (Federated States of Micronesia (FSM), Fiji, Republic of the Marshall Islands (RMI), Palau, Papua New Guinea (PNG), Samoa, Solomon Islands, Tonga, and Vanuatu) in the Pacific Region in partnership with the Secretariat of the Pacific Regional Environment Programme (SPREP). The project was commenced in February 2017, following the previous phase from 2011 to 2016.

Formulation of State Solid Waste Management Strategies (SSWMSs)

J-PRISM II has been supporting the four states of the FSM in formulating their state solid waste management strategies as an important outcome of the project. Support for strategy formulation was also provided during its predecessor project, as well as by other donors. However, J-PRISM II's support differs significantly from the previous support because it involves understanding the current solid waste management (SWM) situation technically as well as quantitatively through baseline surveys in order to set strategic goals and actions.

The formulation of SSWMSs is carried out according to the following two-step approach.



SSWMSs formulated by states in the FSM

Step 1: Understanding the current SWM situation technically as well as quantitatively

In 2017, officers in charge of SWM in each of the four states worked with J-PRISM II experts to conduct a series of baseline surveys in each state. These included waste amount and composition surveys (WACs), as well as incoming waste amount surveys at landfill sites, time and motion surveys, and public opinion surveys. The results were summarized as waste flows, which were used to identify the urgent SWM issues and challenges in each state technically as well as quantitatively and share these among key stakeholders.

Step 2: Formulating strategies to tackle SWM issues and challenges identified

Based on their shared understanding and perception of urgent waste issues and challenges, the key stakeholders formulated SSWMSs in each state. All SSWMSs were endorsed by the respective governors.

The SSWMSs listed several priority activities that each state should undertake. Of these priority activities, those to be tackled urgently by each state were chosen as project outputs of J-PRISM II and officers in charge of SWM in each state are currently implementing improvements along with J-PRISM II experts. The next section details the im-



An EPA officer and a J-PRISM II expert measure the waste discharged by a household per day (2017)

J-PRISM II HIGHLIGHTS



Consultation meeting on the SSWMS in Yap (2018)

provement activities that each state is working on. (Note: PDF files of all SSWMSs are available on the SPREP website at <https://www.sprep.org/j-prism-2/report-and-materials> and via the SPREP Virtual Library at <https://library.sprep.org/>).

Yap: Pilot project to expand the public collection service

Yap is known for its advanced initiatives such as banning the import of plastic shopping bags and introducing a deposit-based recycling scheme for beverage containers (i.e., a container deposit scheme), but the SWM baseline survey revealed that garbage collection by the public sector is not provided in most communities. Thus, expansion of waste collection coverage is the biggest challenge in Yap. The state's Department of Public Works and Transportation (DPW&T) and Environmental Protection Agency (EPA) gathered together with experts of J-PRISM II and decided to tackle this issue by implementing a pilot project under J-PRISM II. Details of the pilot project have been under discussion.

Chuuk: Introduction of a Container Deposit Scheme (CDS) for Recycling

Chuuk has a history of being the first state to adopt a recycling law among the four states of the FSM. In Chuuk, recycling was institutionalized in 1979 for aluminum cans of non-alcoholic beverages such as soda (at the time, the import of alcohol was prohibited), even before the FSM gained its independence. After that recycling activities stopped working, a private company recycled aluminum cans and scrap metal, but since the company went out of business, similar recycling activities have not been carried out at all. Thus, Chuuk is currently the only state in the FSM

that is not undertaking any recycling.

Having recognized that Chuuk EPA and Department of Transportation and Public Works (DT&PW) firmly intend to introduce a deposit-based container recycling scheme, J-PRISM II is making arrangements to provide technical support. Reflecting the strong intentions of the parties concerned, the introduction of a deposit-based recycling scheme is also set as a priority issue in the Chuuk SSWMS. However, prior to the provision of technical assistance, it is essential to prepare recycling facilities (including equipment and materials) and the necessary financial resources to collect beverage containers imported to the island before deposits start to be charged (i.e., "legacy cans"). Therefore, J-PRISM II and other donors are currently helping Chuuk's EPA to prepare in this regard.

Pohnpei: Improvement of the CDS

In Pohnpei, only aluminum cans are handled under the CDS. Currently, collection of aluminum cans is undertaken mainly by EPA in cooperation with the city authorities of Kolonia and Madolenihmw, unlike in Yap and Kosrae, where collection of beverage containers is completely outsourced to private companies. However, collection by EPA has been conducted only a few times a year due to EPA's time constraints, which present many challenges in implementing the CDS in Pohnpei. The waste flow formulated under the SSWMS also reflects such issues, showing a low rate of beverage container recycling in Pohnpei.

In the process of SSWMS formulation, these issues of concern were shared among stakeholders, increasing their intention to improve the CDS.

EPA constructed a new and bigger recycling center near the public disposal site with grass-roots grant aid from Japan, and is also in the process of procuring a new and bigger press machine with non-project grant aid from Japan. Preparations are making good progress. As soon as these preparations are complete, J-PRISM II will start providing technical advice on amendment of laws and regulations to allow handling of beverage containers other than aluminum cans, as well as on privatization of the redemption centers, and on awareness activities.

Kosrae: Introduction of an Inter-Municipal Collection System (IMCS)

Challenge identified: Improvement of collection

Kosrae is the smallest state in the FSM with a population of about 6,000. Kosrae is well known for its depos-

J-PRISM II HIGHLIGHTS



The notice board installed by KIRMA to notify people not to dump waste in open spaces (2017). Several illegal heaps of waste had been observed, especially in the municipalities with no regular waste collection services at the time. These illegal dumps had been removed by the efforts of KIRMA in collaboration with DT&I.

it-based beverage container recycling system, which has been properly implemented by the private company that operates the redemption center and is supervised well by Kosrae Island Resource Management Authority (KIRMA). It is also known for the good operation and management of its public disposal site by the Department of Transportation and Infrastructure (DT&I). As for waste collection, four municipalities on the island are mandated to provide collection services to the residents. However, municipalities with weak finances had been struggling to provide regular collection services to the residents, and the results of the SWM baseline survey under J-PRISM II confirmed that improvement of collection was a challenge to be tackled urgently in Kosrae.

The same baseline survey also revealed that in total, only 18 tons of waste per week were discharged from all four municipalities, as seen in the map below. At the same time, it became apparent that a new 4-ton compactor truck had just been procured through non-project grant aid from Japan. By utilizing this new compactor truck, all of the waste generated on the island could be collected and transported to the public disposal site, and therefore



The four municipalities of Kosrae

the J-PRISM II experts recommended that key stakeholders consider the introduction of an IMCS. The key stakeholders, including mayors, DT&I, KIRMA, and the Governor's Office, conducted a series of discussions among themselves and decided to introduce the IMCS.

Features of the IMCS

In order to introduce the IMCS, three issues had to be resolved first. They were: (i) who would operate the IMCS, (ii) how to finance the IMCS, and (iii) which collection system would be employed for the IMCS. In answer to (i), key stakeholders agreed that DT&I would become the operating agency. In other words, DT&I would provide collection services to the residents, instead of the municipalities. This became possible by amending the state code that defines the roles and responsibilities of DT&I. Now, the provision of waste collection is formally defined as a responsibility of DT&I. With regard to (ii), sustaining the IMCS would require USD 16,000 annually, of which USD 10,000 would be financed by the regular budget of DT&I. The remaining USD 6,000 would be borne by each municipality in proportion to its population size. In response to (iii), a curbside collection method would be employed in most areas, since people live along the main roads in Kosrae. The compactor truck, which has a sound system, would drive past playing music on the collection days. People would bring their wheelie bins to the road side when the music approached. Only in a few locations where the road condition is bad and a compactor truck is unable to pass by, a station-based collection system was employed. The IMCS started in February 2020, after training in waste collection using the new compactor truck, as well as a series of community meetings and awareness-raising activities in each municipality. J-PRISM II will continue to monitor implementation of the IMCS throughout the project period.



Introduction of an Inter-Municipal Collection System (2020)

J-PRISM II HIGHLIGHTS



DECEM: Promotion of knowledge- and experience-sharing among the four states

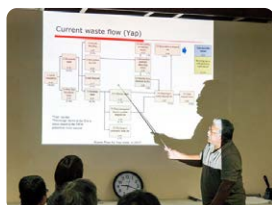
In collaboration with the Department of Environment, Climate Change and Emergency Management (DECEM), J-PRISM II organizes SWM workshops biannually, aiming to provide opportunities for knowledge- and experience-sharing among the four states.

First SWM Workshop in September 2017

The first SWM workshop was held on September 27, 2017. At this workshop, representatives from the states presented the results of their SWM baseline surveys along with waste flows, and identified priority issues for each island. Also, in order to incorporate the essence of the Pacific Regional Waste and Pollution Management Strategy, known as Cleaner Pacific 2025 into the SSWMSs, an expert from SPREP conducted a session to familiarize participants with core values of Cleaner Pacific 2025.



Active discussion at the workshop (2017)



Presentation by the deputy director of Yap DPW&T (2017)

Second SWM Workshop in September 2019

The Second SWM workshop, on the theme of improvement of collection, was held on September 26, 2019. Representatives from each state presented their state's waste collection situation. In addition, states with plans to implement collection improvement activities under J-PRISM II introduced their plans.



Presentation by the director of Kosrae DT&I (2019)



A group picture of the participants (2019)

Knowledge-sharing among three countries in the Micronesia region

J-PRISM II is actively promoting the sharing of knowledge and experiences among participating countries. Provision of regional training as seen below is one such effort under J-PRISM II.

Training on landfill management in Palau, February 2018

On-site training on sanitary landfill design and operation using the Fukuoka Method was conducted in Palau by Fukuoka University and the NPO SWAN Fukuoka from February 5 to 10, 2018, in collaboration with J-PRISM II.

JICA has been conducting a training program in Japan named "Design and Maintenance of Semi Aerobic Landfill Site (Fukuoka Method)," and representatives from Pacific Island Countries have been participating in the training every year. The training in Palau was designed as follow-up training for previous participants in JICA's landfill training in Japan, but landfill management officers who had no experience of the training in Japan were also able to attend the training this time. Of around 30 participants from the Micronesia region, four officers were from the FSM, namely from DPW&T (Yap), DT&PW (Chuuk), Pohnpei Waste Management Service (Pohnpei), and DT&I (Kosrae). They were trained by Japanese experts headed by Professor Matsufuji of Fukuoka University, and gained technical knowledge, alongside brushing up their landfill operation skills, through a half-day seminar and four days of on-site training. Utilizing skills and knowledge gained from the training, participants have subsequently dedicated themselves to improving the management of disposal sites in each country.

Disaster waste management (DWM) workshop in Palau, February 2019

Representatives from Yap, Pohnpei, Kosrae, and Chuuk attended the regional stakeholders' consultation workshop in Palau for the development of the regional DWM guideline. This consultation workshop was coordinated and conducted by J-PRISM II in collaboration with SPREP and the Japanese team that developed the Disaster Waste Management Guideline for Asia and the Pacific. A DECEM official led the representatives from the relevant organizations of the FSM, namely DPW&T (Yap), DT&PW (Chuuk), EPA (Pohnpei), and KIRMA (Kosrae). The five participants

J-PRISM II HIGHLIGHTS



delivered a number of presentations addressing the situation at the national and state levels, providing information on the overall status of DWM in the FSM and how disaster waste is managed. This baseline information was essential for developing the draft regional DWM guideline.

The workshop also provided guidance on the development of a national DWM contingency plan. This is important for future response and recovery measures when disaster strikes. A draft plan was presented and discussed, and participants were tasked with completing it after their return home.



¹ <https://www.env.go.jp/press/files/jp/110165.pdf>

About Us: J-PRISM II in Federated States of Micronesia

In the Federated States of Micronesia, day-to-day activities have been conducted in line with the project framework below in close cooperation with the counterpart agencies:

- Department of Environment, Climate Change and Emergency Management (DECEM)
- Yap: Environmental Protection Agency (EPA), Department of Public Works and Transportation (DPW&T)
- Chuuk: Environmental Protection Agency (EPA), Department of Transportation and Public Works (DT&PW)
- Pohnpei: Environmental Protection Agency (EPA), Office of Transportation and Infrastructure (T&I)
- Kosrae: Kosrae Island Resource Management Authority (KIRMA), Department of Transportation and Infrastructure (DT&I)

Country Activities in Federated States of Micronesia

Federal Level

Purpose	Support to creation of solid waste management system in each four state is provided.
Output 1	Support from DECEM to formulate SSWMS is provided to each state.
Output 2	Good practices of solid waste management /3Rs ² are promoted in the country.

State Level

Purpose	Creation of solid waste management system is promoted.	
All four states	Output 1	New SSWMS and its action plan prepared in line with the Cleaner Pacific (2016-2025) are developed.
	Output 2	Good Practice of solid waste management/ 3Rs are promoted in the country and the region.
Yap & Kosrae	Output 3	Waste collection is improved.
Chuuk & Pohnpei	Output 3	Effective CDS implementation mechanism is explored by relevant authorities.

All the member countries are also assisted under the regional project framework to enhance the regional monitoring mechanism, south-to-south cooperation, disaster waste management, and the 3R+Return system in the region.

Regional Activities including Federated States of Micronesia

- Output 1: Monitoring mechanism for solid waste management in line with Cleaner Pacific 2025 is strengthened.
- Output 2: Regional cooperation is organized and promoted by utilizing regional human resource and sharing good practices in the region.
- Output 3: Regional capacity of disaster waste management is strengthened.
- Output 4: Practical and sustainable 3R+Return system is examined.

² Reduce, Reuse, and Recycle

Contact Us:

J-PRISM II Project Office

c/o P.O. Box 240, Secretariat of the Pacific Regional Environment Programme (SPREP), Apia, Samoa
Telephone: (685) 21929 (ext. 324), Website: <https://www.sprep.org/j-prism-2/home>

J-PRISM II HIGHLIGHTS

Republic of the Marshall Islands



SPREP
Secretariat of the Pacific Regional
Environment Programme



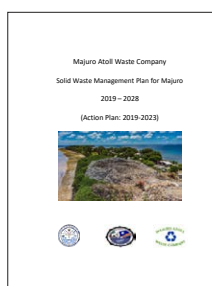
Japanese Technical Cooperation Project for Promotion of Regional Initiative on Solid Waste Management in Pacific Island Countries Phase II (J-PRISM II)

J-PRISM II is the five-and-a-half-year Japanese Technical Cooperation Project for Promotion of Regional Initiative on Solid Waste Management (2017–2022), assisting nine member countries (Federated States of Micronesia (FSM), Fiji, Republic of the Marshall Islands (RMI), Palau, Papua New Guinea (PNG), Samoa, Solomon Islands, Tonga, and Vanuatu) in the Pacific Region in partnership with the Secretariat of the Pacific Regional Environment Programme (SPREP). The project was commenced in February 2017, following the previous phase from 2011 to 2016.

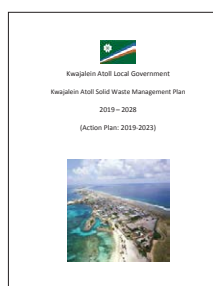
Formulation of Solid Waste Management Plans (SWMPs) in Majuro and Kwajalein

With the support of SPREP, formulation of a national strategy had already been initiated by the Environmental Planning and Policy Coordination Office (OEPPC) when J-PRISM II started. Accordingly, J-PRISM II decided to concentrate on supporting the formulation of solid waste management plans (SWMPs) in the most populated atolls, namely Majuro Atoll and Kwajalein Atoll.

J-PRISM II took the following two-step approach to formulate the SWMPs.



SWMP for Majuro



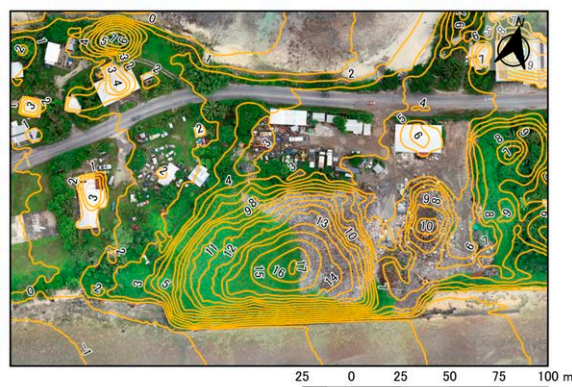
Kwajalein Atoll SWMP

Step 1: Understanding the current SWM situation technically as well as quantitatively

In 2017, officers in charge of waste management at Majuro Atoll Waste Company (MAWC) and Kwajalein Atoll Local Government (KALGOV) worked with J-PRISM II experts to conduct a series of SWM baseline surveys. These included waste amount and composition surveys (WACs), as well as incoming waste amounts surveys at landfill sites, time and motion surveys, and public opinion surveys. The results were summarized as waste flows, which were used to identify the urgent SWM issues and challenges in Majuro and Kwajalein, especially Ebeye, technically as well as quantitatively and share these among key stakeholders.

Step 2: Formulating SWMPs to tackle the SWM issues and challenges identified

Based on their shared understanding and perception of urgent waste issues and challenges, the key stakeholders formulated SWMPs in each area. The SWMP for Majuro was reviewed by the Board of MAWC and officially endorsed by the Minister for Works, Infrastructure and Utilities (MWIU), while the SWMP for Kwajalein was reviewed at the city council meeting and endorsed by the Mayor of Kwajalein Atoll. One of the priority activities stated in the SWMP for Majuro was improvement of its final disposal site; a survey



Aerial photo of final disposal site in Majuro (2018)

J-PRISM II HIGHLIGHTS



on the final disposal site has now been conducted. Based on the survey, the current situation was shared among stakeholders and improvement measures were proposed. (Note: Both SWMPs are available on the SPREP website at <https://www.sprep.org/j-prism-2/report-and-materials> and via the SPREP Virtual Library at <https://library.sprep.org/>).

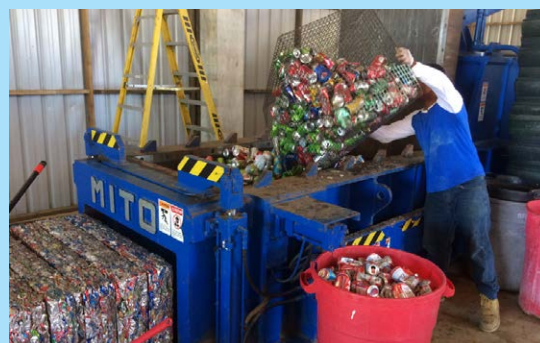
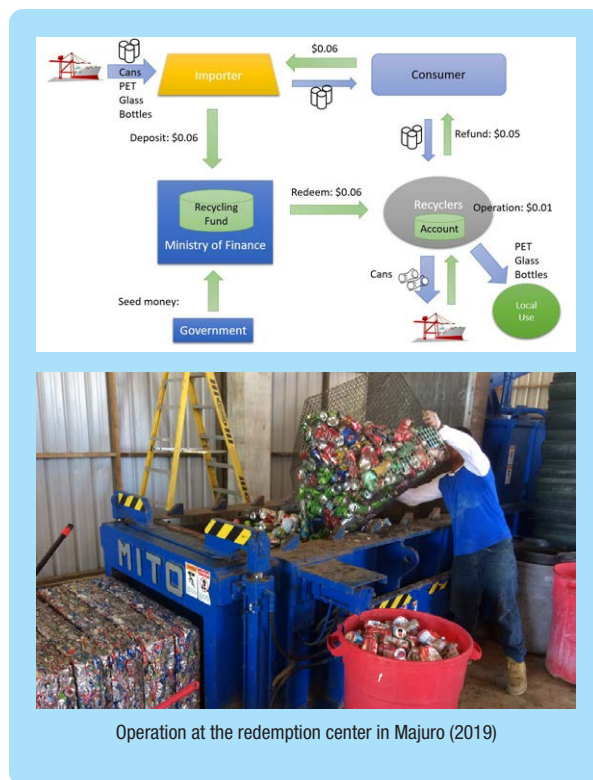
Successful Introduction of Container Deposit Scheme

In the RMI, the then administration considered environmental challenges to be an important political issue, and was keen to introduce a Container Deposit Scheme (CDS) for recycling beverage containers. In response to the sincere request for technical support from the RMI, J-PRISM II decided to assist key counterpart officials in introducing a CDS. J-PRISM II provided a wide range of assistance, including advice on the legislative framework, support to amend the law and formulate detailed rules, and training for MAWC, the designated operator of the redemption center.

The Styrofoam Cups and Plates and Plastic Products Prohibition and Container Deposit Act enacted in 2016 was amended at the Nitijela (the Parliament) in early 2018, and the Environmental Protection Authority prepared the CDS regulations in line with the amendment. The regulations came into effect at the start of July 2018 and at that time RMI Customs started collecting 6-cent deposits on the specified beverage cans and bottles. A month later, MAWC started collecting cans and bottles for recycling and paying out 5-cent refunds to the public. The following diagram shows how the CDS functions in the RMI.

During FY2019 (October 2018 to September 2019), 15.7 million items were handled, of which 59% was aluminum cans, 40% was PET bottles, and 1% was glass bottles. Some of these were “legacy” items that were on the islands before the scheme started.

It is reported that the number of beverage containers littering the streets has decreased drastically since the CDS commenced, which shows that the CDS has contributed significantly to improving environmental hygiene. Although it is currently difficult to export collected plastic bottles, aluminum cans, seen as a valuable resource, are crushed after collection and exported regularly, which contributes to resource circulation.



Operation at the redemption center in Majuro (2019)

Knowledge-sharing among three countries in the Micronesia region

J-PRISM II is actively promoting the sharing of knowledge and experiences among participating countries. Provision of regional training as seen below is one such effort under J-PRISM II.

Training on landfill management in Palau, February 2018

On-site training on sanitary landfill design and operation using the Fukuoka Method was conducted in Palau by Fukuoka University and the NPO SWAN Fukuoka from February 5 to 10, 2018, in collaboration with J-PRISM II.

JICA has been conducting a training program in Japan named “Design and Maintenance of Semi Aerobic Landfill Site (Fukuoka Method),” and representatives from Pacific Island Countries have been participating in the training every year. The training in Palau was designed as follow-up training for previous participants in JICA’s landfill training in Japan, but landfill management officers who had no experience of the training in Japan were also able to attend the training this time. Of around 30 participants from the Micronesia region, two officers were from the RMI, namely from MAWC (Majuro) and KALGOV (Kwajalein). They were



Demonstrating how to make a drainage pipe from used tires (2018)

trained by Japanese experts headed by Professor Matsufuji of Fukuoka University, and gained technical knowledge, alongside brushing up their landfill operation skills, through a half-day seminar and four days of on-site training. Utilizing skills and knowledge gained from the training, participants have subsequently dedicated themselves to improving the management of disposal sites in each country.

Disaster waste management (DWM) workshop in Palau, February 2019

Senior officials of the RMI attended the regional stakeholders' consultation workshop held in Palau in February 2019 for the development of the regional DWM guideline. This consultation workshop was coordinated and conducted by J-PRISM II in collaboration with SPREP and the team that developed the Disaster Waste Management Guideline for Asia and the Pacific. The Director of the National Disaster Management Office led the representatives from the relevant organizations of the RMI, namely MWIU, KALGOV, and MAWC. The presentations delivered by the RMI team provided information on the status of DWM and the roles of different agencies in the management of disaster waste at the national and state levels when natural disaster strikes. The workshop also provided guidance on the development of a national DWM contingency plan for future response and recovery measures when disaster strikes.

¹ <https://www.env.go.jp/press/files/jp/110165.pdf>

About Us: J-PRISM II in Republic of the Marshall Islands

In the Marshall Islands, day-to-day activities have been conducted in line with the project framework below in close cooperation with the counterpart agencies:

- Main Agencies: Ministry of Works, Infrastructure and Utilities (MWIU), Majuro Atoll Waste Company (MAWC), Kwajalein Atoll Local Government (KALGOV)
- Supporting Agencies: Office of Environment Planning and Policy Coordination (OEPPC), Environmental Protection Authority (EPA)

Country Activities in Republic of the Marshall Islands

Purpose	Creation of solid waste management system is promoted.
Output 1	Policy documents necessary to improve SWM system are officially submitted to the relevant authorities. (Note) Policy documents here means i) SWM Plan for MAWC, ii) SWM Plan for KALGOV, iii) National Solid Waste Management Strategy (NSWMS) in line with 2025.
Output 2	Good practices of solid waste management /3R are promoted in the country and the region.
Output 3	CDS mechanisms suitable to RMI are explored by relevant authorities.

All the member countries are also assisted under the regional project framework to enhance the regional monitoring mechanism, south-to-south cooperation, disaster waste management, and the 3R+Return system in the region.

Regional Activities including Republic of the Marshall Islands

- Output1: Monitoring mechanism for solid waste management in line with Cleaner Pacific 2025 is strengthened
- Output2: Regional cooperation is organized and promoted by utilizing regional human resource and sharing good practices in the region
- Output3: Regional capacity of disaster waste management is strengthened
- Output4: Practical and sustainable 3R+Return system is examined

² Reduce, Reuse, and Recycle

Contact Us:

J-PRISM II Project Office

c/o P.O. Box 240, Secretariat of the Pacific Regional Environment Programme (SPREP), Apia, Samoa
Telephone: (685) 21929 (ext. 324), Website: <https://www.sprep.org/j-prism-2/home>