SPREP/SWAP/JPRISM II/PACWASTEPLUS

Online Workshop on Disaster Waste Management

Activity Report

February 2023

Sustainable, transformative, and resilient for a Blue Pacific

SPREP PROE

SPREP/SWAP/J-PRISM II/PACWASTEPLUS

ONLINE WORKSHOP ON DISASTER WASTE MANAGEMENT

ACTIVITY REPORT

FEBRUARY 2023

Contents

I. INTRODUCTION

The frequency and intensity of natural disasters, especially tropical cyclones in the Pacific, have increased and when these natural disasters occur, large amounts of waste, known as disaster waste, are generated from damage to both the natural and man-made environment. These natural disasters are a real challenge for all Pacific islands because of the negative environmental, health, economic and social impacts. In addition to the significant risks to property and people directly caused by disasters, these events can generate a significant amount of waste which in turn can impact health, the economy and the environment. Pacific Islands are particularly vulnerable to the impacts of disaster waste as natural disasters such as tropical cyclones are becoming more intense and frequent.

According to the latest data from the World Risk Report 2021, three of the ten countries with the highest risk of disaster in the world are in the Pacific region, with Vanuatu at 1st, Solomon Islands at 2nd place, and Tonga was considered the third most vulnerable country to disasters. A total of six Pacific islands are included in the top 20 countries most at risk from natural disasters.

To discuss how Pacific Islands (such as Samoa, Tonga and Vanuatu) have coped with managing disaster waste through lessons-learnt and experiences, SPREP, through the SWAP (Committing to Sustainable Waste Actions in the Pacific) project in collaboration with the J-PRISM II project and the PacWastePlus Programme, conducted a three and a half-hour virtual workshop on Thursday 8th December 2022.

II. Concept Note

1.1. Objectives

The workshop was designed for the participants to:

- Inform the origins and the impacts of disaster waste;
- Highlight the challenges of Disaster Waste management in the Pacific;
- Learn how to prepare for minimising Disaster Waste generation;
- Inform of opportunities for Pacific Island Countries to manage Disaster Waste; and
- Inform on safe handling and storage of Disaster Waste.

1.2. Content

The workshop was structured into three sessions.

- The first session **introduced documents with a regional scope:** the Framework for Resilient Development in the Pacific (FRDP) and the Disaster Waste Management Guideline.
- The second session focused on **national activities in Samoa, Tonga, and Vanuatu**, with presentations on their respective Disaster Waste Management Plans and experiences.
- The third session concluded the workshop with a knowledge-sharing session on how to **strengthen Good Practices in Disaster Waste Management**.
- At the end of each session, there were discussions and participants (panellists and attendees) had an opportunity to ask questions.

1.3. Speakers

The speakers were:

1. Framework For Resilient Development (FRDP) In the Pacific: Mr Sione Fulivai - FRDP Coordinator - SPREP
2. Disaster Waste Management Guideline: Mr Faafetai Sagapolutele - Assistant Chief Advisor - JPRISM II;
3. Samoa Disaster Waste Management Plan (DWMP): Mr. Setoa Apo, Principal Solid Waste Management Officer – MNRE;
4. Vanuatu Community Project on Vanuatu's DW response to communities following the Tropical Cyclone Harold in 2020: Ms. Roselyn Bue, Senior Officer, Chemical and Ozone – MCCAMGEEDM;
5. National Action Plan - Tonga: Mr Viliami Tongamana, National Cluster Coordinator, National Emergency Management Office;
6. Lessons learned from Tonga on how they organised a Disaster Waste Management response/clean-up following the tsunami and volcano eruption: Ms. Mafile'o Masi, Chief Environmentalist, MEIDECC;
7. Lessons learned from Tonga on how the disaster waste was managed after the disaster for Asbestos: Ms. Sulieti Pongi Hufanga, PacWastePlus In-country Officer – Tonga;
8. Disaster Waste Management Data Collection Project: Mr. Stalini Naufahu, Manager Special Projects and Information Technology, Waste Authority Ltd (Tonga);

9. Practitioner Guidelines: Ms. Sainimili Bulai, PacWastePlus technical Waste Project Officer – Solid Waste.

III. Virtual Disaster Waste Management Workshop Logistics and Organisation

3.1. Logistics and interpretation services

Since SWAP is a bilingual project involving French Territories and English-speaking countries, the workshop was delivered in English and interpretation was provided to French-speaking participants by OnCall, the SPREP contractor.

To assist the SWAP Project Management Unit, SWAP hired an experience and qualified consultant to handle the logistics of the workshop. Through a Request for Quote, Island Innovation was recruited to provide digital services, including:

- Management of livestreaming event sessions via Zoom Webinar in both English and French; and
- General support related to the management of the event.

3.2. Information to participants

Different ways were used to inform participants of the holding of the SPREP/SWAP/J-PRISM II/PACWASTE PLUS Online workshop on Disaster Waste Management:

- A flyer was drafted in French and English for dissemination on social media (Facebook, LinkedIn, etc) – Appendix 1;
- A circular was circulated to all SPREP Focal Points in French and English – Appendix 2;
- A webpage was developed on the SWAP website:
    - English: https://www.sprep.org/disaster-waste-management-workshop
    - French: https://www.sprep.org/atelier-dechets-de-catastrophes-naturelles; and
- An information was posted on the Green Forum: https://thegreenforum.org/post/participants-various-pacific-countries-have-benefitted-virtual-disaster-waste-management

3.3. Agenda

Time	Topic	Purpose of the presentation	Speaker
1:00pm – 1:05pm	Introduction	Introduction to the logistical arrangements for the meeting	Island Innovation
1:05pm – 1:08pm	Overview of the workshop	Sessions and topics Objectives of the workshop	Ms Julie Pillet Technical Waste Project Coordina tor, SWAP
1:08pm – 1:13pm	Welcome	Opening remarks	Mr Anthony Talouli WMPC, Director

Time	Topic	Purpose of the presentation	Speaker
1:13pm – 1:23pm	Framework For Resilient Development (FRDP) In the Pacific	Key Principles GOAL 3 - Strengthened disaster preparedness, response and recovery	Mr Sione Fulivai FRDP Coordinator, SPREP
1:23pm – 1:33pm	Discussion		Ms Julie Pillet Technical Waste Project Coordinator, SWAP
1:33pm – 1:43pm	Disaster Waste Management Guideline	DW prevention and mitigation Preparedness Early warnings DWM response measures	Mr Faafetai Sagapolutele, Assistant Chief Advisor, JPRISM II
1:43pm – 1:53pm	Discussion		Ms Julie Pillet Technical Waste Project Coordinator, SWAP
1:53pm – 1:55pm	Photo	Group photo	Island Innovation
1:55pm – 2:10pm	BREAK		
2:10pm – 2:20pm	Samoa National Action Plan (NAP) for Disaster Risk Management	How is Disaster Risk Management organised in Samoa? What are the NAP governance arrangements? What are the monitoring and evaluation tools?	Ms. Fesolai Molly Nielsen, ACEO - National Disaster Management Office
2:20pm – 2:30pm	Activity Presentation – Samoa DWMP	Preparation (Institutional Framework, clusters,)	Mr. Setoa Apo, Principal Solid Waste Management Officer – MNRE
2:30pm – 2:40pm	Activity Presentation – Vanuatu Community Project	How did Vanuatu organise Disaster Waste Management response with communities following the tropical cyclone Harold in 2020? What were the key challenges?	Ms. Roselyn Bue, Senior Officer, Chemical and Ozone – MCCAMGEEDM
2:40pm – 2:48pm	Lessons learned from Tonga on how the disaster waste was managed after the disaster	Interviews of key stakeholders involved in Disaster Waste Management after the tsunami and volcano eruption.	SWAP video - capsule
2:48pm – 2:58pm	National Action Plan - Tonga	Overview on how Disaster Risk Management is arranged in Tonga?	Mr Viliami Tongamana, National Cluster Coordinator, National Emergency Management Office
2:58pm – 3:08pm	Lessons learned from Tonga on how the disaster waste was managed after the disaster	How did Tonga organise Disaster Waste Management response/clean-up following the tsunami and volcano eruption? What were the key challenges?	Ms. Mafile'o Masi, Chief Environmentalist, MEIDECC

Time	Topic	Purpose of the presentation	Speaker
3:08pm – 3:18pm	Lessons learned from Tonga on how the disaster waste was managed after the disaster	Asbestos focus	Ms. Sulieti, PacWaste Plus In-country Officer - Tonga
3:18pm – 3:38pm	Discussion		Ms Julie Pillet Technical Waste Project Coordinator, SWAP
3:38pm – 3:53pm	BREAK		
3:53pm – 4:03pm	Disaster Waste Management Data Collection Project	Introduction of the DWM Data Collection Project in Tonga Presentation of KoboToolBox	Mr. Stalini Naufahu Manager Special Projects and Information Technology Waste Authority Ltd (Tonga)
4:03pm – 4:13pm	Practitioner Guidelines	1. Guideline in drafting National and Community Disaster Waste Management 2. Guideline on Establishing Environment Sector Working Group 3. Guideline on Standard Methodology for Estimating Disaster Waste.	Ms. Sainimili Bulai PacWaste Plus technical Waste Project Officer – Solid Waste
4:13pm – 4:23pm	Discussion		Ms. Julie Pillet Technical Waste Project Coordinator, SWAP
4:23pm – 4:28pm	Closing Remarks	Wrap-up and Closing Remarks	Mr. Anthony Talouli WMPC, Director
4:28pm – 4:30pm	Workshop Assessment	Online Assessment Form to get feedback from participants	Island Innovation

3.4. Participants

The registration went through an online Registration Form (Appendix 3): https://swap.virtualislandsummit.com/.

According to the Post-Event Report (Appendix 6) provided by Island Innovation as part of the logistics service, registration for the Workshop gathered a total of 31 responses. The contact details of the registered persons are provided in Appendix 4.

Out of the 31 registered participants, 15 (48.4%) were females, 15 (48.4%) were males with 1 (3.2%) identified as Other. In terms of nationalities, majority were from Fiji, with 13 (42%) of the total registered participants. There was also a strong presence from Australia (6.5%), Japan (6.5%), USA (16.1%), Solomon Islands (9.7%) and Tonga (9.7%). The registered participants varied from being project coordinators and environmentalist to advisors and researchers of civil society organizations, media networks, or government offices.

During the live virtual delivery, 18 participants joined the workshop at max (peak) attendance.

IV. Virtual Disaster Waste Management Workshop Outcomes

5.1. Workshop Notes

The workshop began with an introduction to the logistical arrangements from the Island Innovation team followed by an overview of the workshop by Ms Julie Pillet who was the lead facilitator for the workshop. She is also the Technical Waste Project Coordinator for SWAP. This was followed by opening remarks from Mr Anthony Talouli, who welcomed all attendees to the workshop.

5.1.1. Framework For Resilient Development (FRDP) In the Pacific

The first presentation was conducted by Mr Sione Fulivai, FRDP Coordinator, providing an overview of the Framework for Resilient Development in the Pacific and its key principles.

The Framework for Resilient Development in the Pacific (FRDP) is a regional framework that provides guidance on how to enhance resilience to climate change and disasters in sustainable ways. It has three main goals:

- Goal 1: To strengthen integrated adaptation and risk reduction to enhance resilience to climate change and disasters.
- Goal 2: Low carbon development.
- Goal 3: Strengthened disaster preparedness, response and recovery (with potential to turn post-disaster waste into energy).

The FRDP relies on Pacific partnerships and has a governance structure with a Pacific Resilience Partnership (PRP) Task Force, PRP Support Unit, five Technical Working Groups, and a biennial Pacific Resilience Meeting (PRM).

5.1.2. Disaster Waste Management Guideline

The Disaster Waste Management Guideline, presented by Mr Faafetai Sagapolutele, Assistant Chief Advisor of JPRISM II, aims to provide guidance on appropriate measures for Pacific Island Countries (PICs) to manage waste during disasters.

- The guideline focuses on preventing and mitigating disaster waste, being prepared for disasters, and effectively responding to and recovering from them. The main objective of the guideline is to integrate disaster waste management into the PICs' national disaster management planning process for improved coordination and institutional support.
- The goal of the guideline is to improve PICs' capacity for managing disaster waste. The rationale for developing the guideline is that PICs are highly vulnerable to natural hazards and managing the waste generated during these events is a challenge. The guideline aims to promote international best practices and measures for managing disaster waste. The guideline covers stages such as prevention and mitigation, preparedness, response, recovery, and reconstruction.
- Four draft national disaster waste management plans have been developed for Samoa, Tonga, Solomon Islands, and Vanuatu.

5.1.3. Samoa Disaster Waste Management Plan (DWMP)

This presentation focused on national activities, with Mr Setoa Apo, from the Ministry of Natural Resources and Environment (MNRE) in Samoa, providing an overview of the Samoa Disaster Waste Management Plan.

- The presentation discussed the importance of a Disaster Waste Management (DWM) Plan for Samoa, which is vulnerable to natural hazards such as tropical cyclones, floods, earthquakes, and volcanoes. Mr. Setoa Apo highlighted the potential for waste to be generated from these hazards and the need for immediate and coordinated waste management to prevent further damage to the environment, health, and economy. He also mentioned the availability of international guidelines for disaster waste management, such as the UNEP Disaster Waste Guideline 2011 and the Asia Pacific Disaster Waste Guideline 2018.
- MNRE has a draft DWM Response Plan, which aims to provide detailed response actions and outline key roles and responsibilities for government agencies and stakeholders. The plan also focuses on mainstreaming disaster waste management into the National Disaster Management Plan, promoting appropriate practices, enhancing coordination, and securing resources for restoring affected waste management facilities. The plan falls under Samoa's National Disaster Management Act 2007 and Waste Management Act (WMA) 2010 and covers high-risk hazards as identified in the National Disaster Management Plan. The ministry is also proposing the establishment of a Disaster Waste Committee and coordination with existing national and technical committees.

5.1.4. Vanuatu Community Project on Vanuatu's DW response to communities following the Tropical Cyclone Harold in 2020

In her presentation, Ms. Roselyn Bue, Senior Officer in the Chemical and Ozone Division from the Ministry of Climate Change, Adaptation, Meteorology, Geo-Hazards, Energy, Environment, Disaster Management and Meteorological Services in Vanuatu, discussed the strategies and challenges surrounding disaster waste management response in the aftermath of Tropical Cyclone Harold in 2020. Specifically, she delved into the implementation of the Policy Development and the piloting of the Regional Disaster Waste Management tool kit through a training in November 2019 and subsequent workshop to develop Vanuatu's National Disaster Waste Management Contingency Plan.

- The Tropical Cyclone Harold Disaster Waste Assessment was conducted in 10 locations across the Sanma Province and Penama Province on four islands, including Santo Island, Malo Island, Aore Island, and Pentecost Island. Most of the waste found at these locations was Green Waste and Building Debris, including bulky items such as iron roofing and timber. The total amount of disaster waste assessed was 238.7 m^3, with 124 m^3 being bulky waste, 81.7 m^3 being non-recyclable waste, and 33 m^3 being recyclable waste.
- Ms. Bue highlighted several key challenges faced during the disaster waste management response, including funding issues, delays in response, difficulty in data analysis, lack of appropriate equipment and resources, and the need for improved collaboration between relevant stakeholders. Additionally, on the islands far from the main town, it proved difficult to engage individuals in clean-up and recovery efforts as they were primarily focused on

rebuilding their homes and gardens. The transportation of waste from smaller islands to the main island also proved costly and logistically challenging.

- In terms of recovery efforts, a Post Disaster Needs Assessment (PDNA) Report was submitted to the Prime Minister's Office, covering both disaster waste and biodiversity recommendations post assessments. Additionally, a formal request for assistance was sent to the Secretariat of the Pacific Regional Environment Programme (SPREP) and assistance in the form of disaster waste response equipment was donated by the International Cooperation Agency.
- In recognition of the challenges faced in disaster waste management response, the Government of Vanuatu, through the Department of Environmental Protection & Conservation under the Ministry of Climate Change & Adaptation, established a Disaster Waste Cluster under the National Disaster Framework in 2021. This cluster includes a sub-cluster for Disaster Waste and another for Biodiversity Loss, linking all key sectors including the government, sub-government, and NGO stakeholders. The expectation is for continued dialogue and support from Regional and International Organisations, such as SPREP, to provide technical and financial assistance in line with the country's needs post-disaster.

5.1.5. National Action Plan - Tonga

For this presentation Mr Viliami Tongamana, the National Cluster Coordinator of the National Emergency Management Office (NEMO) presented on Tonga's National Action Plan and provided an overview on how Disaster Risk Management is arranged in Tonga.

- During the presentation, Mr. Viliami, provided an overview of Tonga's National Action Plan and the organisation's approach to Disaster Risk Management. NEMO's mandate is established by the Emergency Management Act 2007, which will soon be replaced by the Disaster Risk Management Bill 2021 upon receiving approval. He discussed NEMO's focus on disaster preparedness, including planning, risk assessment, training, and exercises at national, district, and village levels, as well as awareness programs in schools and communities and media outreach through television and radio programs.
- He also highlighted NEMO's role in disaster response, which includes coordinating with national and international partners and managing disaster assessments, planning, communication, logistics, and humanitarian relief efforts. Additionally, Mr. Tongamana discussed NEMO's efforts in disaster recovery and reduction, including the organisation's activities throughout the Disaster Management Cycle.
- He also provided a brief overview of the new Disaster Risk Management Bill 2022, which contains 17 parts and aims to establish a legal, institutional, and regulatory framework for disaster risk reduction and preparedness, emergency response, and disaster recovery. He noted that the bill places a greater emphasis on disaster risk management generally, rather than just emergency management, and highlights the legalisation of the Cluster system and the establishment of functions and responsibilities for clusters. Finally, Mr. Tongamana discussed the governance structure for the National Disaster Council, which is chaired by the Minister of MEIDECC and includes the National Emergency Management Council, National Emergency Operations Committee, and National Emergency Recovery Committee, with NEMO serving as chair for all three.

5.1.6. Lessons learned from Tonga on how they organised a Disaster Waste Management response/clean-up following the tsunami and volcano eruption

Ms. Mafile'o Masi, the Chief Environmentalist at the Ministry of Meteorology, Energy, Information, Disaster Management, Environment, Climate Change, and Communications (MEIDECC), presented on the lessons learned from Tonga's management of disaster waste in the aftermath of the tsunami and volcano eruption in January 2022. Ms. Masi discussed how Tonga organised its Disaster Waste Management response and clean-up efforts, as well as the key challenges faced during the process.

- On January 15, 2022, the Hunga Tonga Hunga Ha'apai submarine volcano in the Tongan archipelago erupted, leading to devastating tsunamis in multiple Pacific nations, including Tonga, Fiji, American Samoa, Vanuatu, and countries along the Pacific rim. Tragically, at least two individuals were killed and several more were injured due to waves reaching up to 20m in height. This was the largest volcanic eruption since the 1991 eruption of Mt Pinatubo and the most powerful eruption since the 1883 eruption of Karakatoa.
- She also provided visual representation of the aftermath of the volcanic eruption and tsunami, as well as information on the response and recovery efforts. The Disaster Waste Response Plan, endorsed by the National Emergency Management Committee (NEMC), was led by the Department of Environment, with support from various agencies including the Ministry of Health, Water and Land, the Prime Minister's Office, the Japan International Cooperation Agency, the Australian Department of Foreign Affairs and Trade, the Ministry of Police, the Tonga Red Cross Society, the No Pelesitiki Campaign, and local communities.
- Despite the challenges faced due to the remote location, limited communication infrastructure, lack of appropriate equipment, and the outbreak of COVID-19, Ms. Masi emphasised that the clean-up and recovery efforts would not have been possible without the active participation of local communities. Additionally, Ms. Masi highlighted the difficulties posed by the surplus of relief supplies and the strain on landfill capacity. Overall, Ms. Masi's presentation provided valuable insights into the complexities of managing disaster waste in the aftermath of a catastrophic event.

5.1.7. Lessons learned from Tonga on how the disaster waste was managed after the disaster for Asbestos

In her presentation, Ms. Sulieti, the PacWastePlus In-country Officer in Tonga, discussed the lessons learned from the management of asbestos disaster waste in the country. She highlighted the importance of investing in long-term management solutions, as well as the need to address the health and environmental impacts of disaster waste and asbestos debris.

- The Department of Environment, under the Ministry of Meteorology, Energy, Information, Disaster Management, Environment, Climate Change and Communications (MEIDECC), is working to build on the efforts of PacWastePlus and invest in the development of effective solutions for the management of Asbestos Containing Materials (ACM) in Tonga.
- In particular, the department is focusing on the Tapuhia Landfill, which is managed by the Waste Authority Limited and is an authorised site for solid waste management and disposal in Tongatapu. Collection services have been extended to the outer islands of Vava'u in 2018, Ha'apai and 'Eua in 2020. The landfill covers an area of approximately six hectares and is located between 15 to 20 meters above sea level.

- According to the Waste Management Act (2005), Waste Authority Limited is the authority for waste management collection services and disposal at the landfill in Tonga and in the outer islands. The landfill consists of four cells, with cell one being full, cell two reaching fifty percent of its capacity, and plans for the construction of cell three next year.
- The department is also considering opportunities for in-country disposal of asbestos, which would reduce environmental and health exposure impacts, reduce costs, and eliminate the need for long-term storage. Additionally, it would eliminate the need for off-island shipping and reduce the carbon footprint.
- In order to address the ACM in Tonga, the department is working on developing national legislation to ban the importation of asbestos or goods containing asbestos, as well as an asbestos Code of Practice to guide the management and handling of asbestos. The department is also working to establish an asbestos Inspectorate and identify best practices for asbestos disposal at the landfill.

5.1.8. Disaster Waste Management Data Collection Project

In his presentation, Mr. Stalini Naufahu, Manager of Special Projects and Information Technology at the Waste Authority Ltd in Tonga, provided insight into the Disaster Waste Management Data Collection Project in Tonga. The project, which is based on the Tonga Volcano-tsunami Post-disaster Data & Information Collection Pilot Project (Mar-July 2022), aims to strengthen good practices in disaster waste management through the use of advanced technology, specifically the KoboToolBox app.

- Mr. Naufahu began by introducing the audience to KoboToolBox, a suite of tools for field data collection that are specifically designed for use in challenging environments, such as remote and offline areas. He highlighted the app's ability to track GPS locations and its significance in disaster response and recovery efforts.
- The presentation then delved into the specific ways in which the Tonga Waste Authority Ltd utilised the KoboToolBox app at all waste disposal sites on Tongatapu Island. Mr. Naufahu explained the process of data collection and the data outputs that were generated in excel for further analysis.
- In the context of the presentation, Mr. Faafetai also provided background information on the significant quantities of disaster waste that were generated because of the destructive tsunami caused by the Hunga Tonga Hunga Ha'apai submarine volcano. He displayed images of the devastation caused by the tsunami to both the natural and built environments.
- As part of the Disaster Response & Recovery Support of JPRISM 2 to Pacific Island Countries (PICs) during disaster events, equipment and tools were provided to Tonga. These resources were used to support maintenance operations of the waste disposal sites and to establish an Information System to gather information and data on the generated disaster waste.
- The purpose of the project is to pilot the collection of disaster waste data and information in Tonga using the KoboToolBox app as one of the available mobile data collection platforms. The key objectives of the project include:
    - Establishing an information system to support the quick collection of data and information on disaster waste during disaster and emergency events in Tonga.

  - Improving data collection, monitoring, and management of collected, disposed, and recovered waste for recycling purposes in the long term.
  - Utilizing the established system for other general waste management information assessment and monitoring purposes.
- The project employed various methodologies, including daily recording of the incoming waste to the disposal sites, key data and information collection, and the use of a mobile data platform to quickly gather data. The system was able to generate reports on various aspects of disaster waste management, including the number of incoming truckloads, the composition of incoming waste, and the locations of collected waste.

5.1.9. Practitioner Guidelines

During the last presentation, Ms. Sainimili Bulai, the PacWastePlus technical Waste Project Officer for Solid Waste, discussed the practitioner guidelines for drafting national and community disaster waste management plans, establishing environment sector working groups, and standard methodology for estimating disaster waste. She provided a comprehensive overview of the PacWastePlus project, which aims to generate improved economic, social, health, and environmental benefits for Pacific Island countries and territories (PICs) by strengthening regional economic integration and sustainably managing natural resources and the environment.

- The specific objective of the PacWastePlus project is to ensure the safe and sustainable management of waste with due regard for the conservation of biodiversity, health and wellbeing of Pacific Island communities, and climate change mitigation and adaptation requirements. The project focuses on three priority waste streams: hazardous waste, solid waste, and wastewater.
- Ms. Bulai discussed the key result areas (KRA) of the PacWastePlus project, including the development of a regional waste management data framework, regional research activities, and national education and awareness plans. She also discussed the legislative frameworks for waste licensing and monitoring, asbestos management, sustainable financing, and disaster waste management task force. In addition, she discussed the on-ground action and best practice initiatives, such as organics processing technologies, end-of-life vehicle management, and re-use and repair centres. Finally, Ms. Bulai discussed the capacity building initiatives, including school education curriculum and waste management tertiary and vocational course development.
- Given the Pacific region's vulnerability to natural disasters, Ms. Bulai emphasised the importance of enhancing PICs' resilience to disasters through proper management of waste generated from natural disasters. This includes incorporating waste management into the national disaster management process, empowering local communities to improve daily waste management, and enhancing in-country capacity to manage high volumes of waste.
- The project will be implemented in a pilot country, where a waste management cluster within the National Disaster Management Office (NDMO) will be established, a national disaster plan will be developed and implemented, and partnership agreements with stakeholders will be formed. First responders and local officers will also be trained. From the learnings of the pilot project, resources will be developed to assist other countries, including guidelines on the establishment of waste management clusters, practitioner guidelines,

drafting national disaster waste management frameworks, and partnership agreements for effective management of disaster waste. Additionally, a training manual on disaster waste management will be developed, as well as a video to guide local practitioners. PacWastePlus will be working with a pilot country to trial all guidelines before finalization.

5.2. Materials

5.2.1. Presentations

The nine presentations are provided in Appendices 5:

- Framework For Resilient Development (FRDP) In the Pacific: Appendix 5a;
- Disaster Waste Management Guideline: Appendix 5b;
- Samoa Disaster Waste Management Plan (DWMP): Appendix 5c;
- Vanuatu Community Project on Vanuatu's DW response to communities following the Tropical Cyclone Harold in 2020: Appendix 5d;
- National Action Plan – Tonga: Appendix 5e;
- Lessons learned from Tonga on how they organised a Disaster Waste Management response/clean-up following the tsunami and volcano eruption: Appendix 5f;
- Lessons learned from Tonga on how the disaster waste was managed after the disaster for Asbestos: Appendix 5g;
- Disaster Waste Management Data Collection Project: Appendix 5h;
- Practitioner Guidelines: Appendix 5i.

5.2.2. Recording

The recording of the workshop is available on SPREP YouTube Channel (in English and French) at:

- English: https://youtu.be/-vB2WFyQhHE
- French:
  - Part 1 (Introduction): https://youtu.be/IblNj8wQ6o4
  - Rest of recording: https://youtu.be/XMoy-QNy35U

5.2.3. Additional materials

Additional materials are available here:

- Framework for Resilient Development in the Pacific (FRDP): https://www.resilientpacific.org/en/framework-resilient-development-pacific
- Disaster Waste Management Guideline: https://library.sprep.org/content/pacific-island-countries-regional-disaster-waste-management-guideline
- Resources from PacWastePlus, Ms. Sainimili Bulai on her presentation - Practitioner Guidelines
  - Video on Grow a Wish Short Film: https://www.youtube.com/watch?v=_XgI0lY7mJc
- Documentary on how Tonga has handled disaster waste generated by Jan2022 volcanic eruption & tsunami:
  - English version: https://youtu.be/JYbIPNlFSJU
  - French version: https://youtu.be/uXmRbYgtLYM
  - 7-minute teaser: https://youtu.be/gD8TJcnwy34

  - 1.5-minute short-cut: https://youtu.be/KTzr_-jrlTQ
- Feature articles were published on SPREP Website:
  - English version: https://www.sprep.org/news/pacific-islands-supported-to-better-manage-disaster-waste
  - French version: https://www.sprep.org/news/un-atelier-pour-preparer-les-pays-du-pacifique-a-mieux-gerer-les-dechets-issus-de-catastrophes-naturelles

V. Survey

Before the closing remarks, the attendees were requested to file an online survey to assess the Disaster Waste Management Workshop including format, length, content, presentations, logistics, etc. The survey was in French and English.

The links for the survey (in English and French) are as follows:

- English link https://www.surveymonkey.com/r/swap_survey_eng
- French link https://www.surveymonkey.com/r/swap_survey_fr

The questions were as follows, and the participants were given the opportunity to add comments to detail their thoughts:

- Question 1: In general, are you satisfied with the Disaster Waste Management Workshop?
- Question 2: Was the length of the workshop appropriate?
- Question 3: Did the agenda and content of the Disaster Waste Management Workshop meet your expectations?
- Question 4: Were the topics covered in sufficient detail?
- Question 5: Was the quality of the interventions satisfactory?
- Question 6: What improvements could be made at the next workshop (length, content, format, etc.)?

Responses were anonymised to facilitate participation in the survey.

Unfortunately, only three attendees filled out the online survey. Their responses are provided in Appendix 7. In summarise, all of the participants who sent in their assessments were satisfied with the workshop. The two main comments are:

- a face-to-face workshop would be a good improvement;
- more experience sharing from stakeholders and projects would also be relevant in a future workshop on Disaster Waste Management.

Appendices

- Appendix 1 – Flyers
- Appendix 2 – Circulars
- Appendix 3 – Registration Form
- Appendix 4 – Contact details of registered persons
- Appendix 5: Presentations
  - Appendix 5a – Framework for Resilient Development (FRDP) In the Pacific.
  - Appendix 5b – Disaster Waste Management Guideline.
  - Appendix 5c – Samoa Disaster Waste Management Plan (DWMP).
  - Appendix 5d – Vanuatu Community Project on Vanuatu's DW response to communities following the Tropical Cyclone Harold in 2020.
  - Appendix 5e – National Action Plan – Tonga.
  - Appendix 5f – Lessons learned from Tonga on how they organised a Disaster Waste Management response/clean-up following the tsunami and volcano eruption.
  - Appendix 5g – Lessons learned from Tonga on how the disaster waste was managed after the disaster for Asbestos.
  - Appendix 5h – Disaster Waste Management Data Collection Project.
  - Appendix 5i – Practitioner Guidelines.
- Appendix 6 – Post-Event report
- Appendix 7 – Survey responses

Appendix 1: Flyers

Background

Disaster waste (DW) refers to the overwhelming waste generated during disasters, as a result of the impacts of extreme natural hazards to the surrounding natural environment, public infrastructure and facilities as well as people`s properties. Response operations also generate large volumes of waste during the distribution of relief goods to affected populations, especially from packaging and other materials. These natural disasters are a real challenge for all Pacific islands because of the negative environmental, health, economic and social impacts. In addition to the significant risks to property and people directly caused by disasters, these events can generate a significant amount of waste which in turn can impact on health, the economy and, or the environment. For example:

- Piles of waste on the roads can delay emergency lifesaving operations,
- Sharp waste such as broken glasses and deformed pieces of metals can cause serious injuries,
- Piles of waste can become breeding sites for mosquitoes and rats,
- Some hazardous wastes such as used oil or chemicals can spread and pollute the soil, rivers or the sea, groundwater, the atmosphere or even have health effects if not handled with care.

Disaster Waste Management Workshop

To discuss this issue, SPREP, through the SWAP project in collaboration with the J-PRISM II project and the PacWastePlus Programme, plans to conduct a three and half-hour virtual workshop to be held on December 8, 2022. Disaster Waste Management Authorities involved in Disaster Waste Management in the Pacific, or beyond, and wishing to learn more about how to prevent waste generation of in the event of a disaster or organise an effective response after such an event are highly encouraged to attend this experience sharing workshop. This virtual workshop will be structured in three sessions:

- The first session will start the workshop with introduction of documents with a regional scope: Framework For Resilient Development In the Pacific and Disaster Waste Management Guideline;
- The second session will focus on national activities in Samoa, Tonga and Vanuatu; and
- The third session will close the workshop with knowledge sharing on how to strengthen Good Practices.

Objectives of the workshop

The workshop is designed for the participants to:

- Inform the origins and the impacts of disaster waste;
- Highlight the challenges of Disaster Waste management in the Pacific;
- Learn how to prepare for minimising Disaster Waste generation;
- Inform of opportunities for Pacific Island Countries to manage Disaster Waste; and
- Inform on safe handling and storage of Disaster Waste.

For further information please contact:

Ms Julie Pillet, Technical Waste Project Coordinator, SWAP on juliep@sprep.org

AFD AGENCE FRANÇAISE DE DÉVELOPPEMENT
SPREP Secretariat of the Pacific Regional Environment Programme
SWAP Sustainable Waste Actions in the Pacific
J-PRISM
EUROPEAN UNION
SPREP Secretariat of the Pacific Regional Environment Programme
PacWastePlus PACIFIC WASTE MANAGEMENT

EVENEMENT A VENIR

8 décembre, 2022
13h00 (Fuseau horaire des Samoa)

Atelier en ligne sur la gestion de déchets issus de catastrophes naturelles:

Partage d'expériences par les îles du Pacifique

zoom

Les informations pour accéder à l'atelier en ligne sont disponibles **ICI**

Le formulaire d'enregistrement est accessible ICI

Contexte

On entend par « déchets issus de catastrophes naturelles » l'énorme quantité de déchets produite au cours de catastrophes naturelles en raison de l'impact des phénomènes naturels extrêmes sur le milieu naturel, les infrastructures et installations publiques, ainsi que sur les biens et les personnes. Les interventions post-catastrophes génèrent également d'importants volumes de déchets lors de la distribution de biens de première nécessité aux populations touchées, notamment des déchets issus des emballages et autres matériaux. Ces catastrophes naturelles constituent un véritable défi pour les îles du Pacifique en raison de leurs effets négatifs sur l'environnement, la santé, l'économie et la société. Outre les risques non négligeables pour les biens et les personnes directement causés par les catastrophes, ces phénomènes peuvent générer une quantité importante de déchets qui, à leur tour, peuvent avoir un impact sur la santé, l'économie et/ou l'environnement.

Par exemple :

- Les piles de déchets sur les routes peuvent retarder les opérations de secours d'urgence.
- Les déchets tranchants, tels que le verre brisé et les pièces métalliques déformées, peuvent causer des blessures graves.
- Les piles de déchets peuvent devenir des nids de reproduction pour les moustiques et les rats.
- Certains déchets dangereux, comme les huiles usagées ou les produits chimiques, peuvent se répandre et polluer les sols, les cours d'eau ou la mer, les eaux souterraines, l'atmosphère ou même avoir des effets sur la santé s'ils ne sont pas manipulés avec soin.

Atelier sur la gestion de déchets issus de catastrophes naturelles

Pour aborder cette question, le PROE, par l'intermédiaire du projet SWAP et en collaboration avec le projet J-PRISM II et le programme PacWastePlus, conduira un atelier en ligne, d'une durée de 3h30, le 8 décembre 2022. Les autorités en matière de gestion des déchets issus de catastrophes naturelles dans le Pacifique, ou au-delà, et souhaitant en savoir plus sur la façon de prévenir la production de déchets en cas de catastrophe ou d'organiser une intervention efficace après un tel événement sont vivement encouragés à se joindre cet atelier en ligne de partage d'expérience qui comprendra les trois sessions suivantes :

- la première partie comprendra une présentation des documents de portée régionale : Cadre en faveur d'un développement résilient dans le Pacifique et Directives sur la gestion de déchets issus de catastrophes naturelles ;
- la deuxième partie sera axée sur les activités nationales aux Samoa, aux Tonga et au Vanuatu ; et
- la troisième partie consistera à partager des connaissances sur la manière de renforcer les bonnes pratiques.

Objectifs de l'atelier

Au cours de cet atelier, les intervenants :

- apporteront des éléments d'information sur les origines et les impacts des déchets issus de catastrophes naturelles ;
- apporteront un éclairage sur les défis liés à la gestion des déchets issus de catastrophes naturelles dans le Pacifique ;
- apprendront à se préparer pour minimiser la production de déchets issus de catastrophes naturelles ;
- informeront les pays insulaires du Pacifique des possibilités de gestion des déchets issus des catastrophes naturelles ; et
- feront part des pratiques de manipulation et de stockage sans danger des déchets issus de catastrophes naturelles.

Pour toute information complémentaire, veuillez contacter:

Mme Julie Pillet, Coordinatrice technique en gestion des déchets, dédiée au projet SWAP
juliep@sprep.org

AFD AGENCE FRANÇAISE DE DÉVELOPPEMENT
SPREP Secretariat of the Pacific Regional Environment Programme
SWAP Sustainable Waste Actions in the Pacific
J-PRISM
EUROPEAN UNION
SPREP Secretariat of the Pacific Regional Environment Programme
PacWastePlus PACIFIC WASTE MANAGEMENT

Appendix 2: Circulars

SPREP
Secretariat of the Pacific Regional Environment Programme

CIRCULAR

FILE: AP_6/15 **TO:** SPREP National Focal Points

DATE: 17 November 2022

CIRCULAR: 22/101

SUBJECT: **Invitation to attend the virtual SPREP/SWAP/J-PRISM II/PACWASTE PLUS workshop on Disaster Waste Management: Experience and lessons-learnt sharing on disaster waste management from the Pacific Islands: 8 December 2022 – Virtual (via Zoom) - 1.00 pm – 4.30 pm Samoa Standard Time**

Dear Members,

The frequency and intensity of natural disasters especially tropical cyclones in the Pacific are increasing and when these natural disasters occur, large amounts of waste, known as disaster waste, are generated from damage to both the natural and man-made environment.

These natural disasters are a real challenge for all Pacific islands because of the negative environmental, health, economic and social impacts. In addition to the significant risks to property and people directly caused by disasters, these events can generate a significant amount of waste which in turn can impact on health, the economy and, or the environment.

Pacific Islands are particularly vulnerable to the impacts of disaster waste, as natural disasters such as tropical cyclones are becoming more intense and frequent.

According to the latest data from the World Risk Report 2021, three of the ten countries with the highest risk of disaster in the world are in the Pacific region, with Vanuatu at 1st, Solomon Islands at 2nd place and Tonga was considered the third most vulnerable country to disasters. A total of six Pacific islands are included in the top 20 countries most at risk from natural disasters.

To discuss how Pacific Islands (such as Samoa, Tonga and Vanuatu) have coped with managing disaster waste through lessons-learnt and experiences, SPREP, through the SWAP (*Committing to Sustainable Waste Actions in the Pacific*) project in collaboration with the J-PRISM II project and the PacWaste Plus Programme, will be conducting a three and half-hour virtual workshop on **Thursday 8th December 2022 at 1pm Samoa time**.

In addition, we will be hosting in-person workshop hubs for Fiji, Samoa, Tonga and Vanuatu. If you wish to join from one of the in-country workshop hubs, please refer below for information on locations/venues:

Country	Venue locations
Fiji	SPC, Suva, Fiji (Room details TBC)
Samoa	Pacific Climate Change Centre, Room 1 at SPREP, Avele, Samoa
Tonga	MEIDECC's Conference Room, Nuku'alofa, Tonga
Vanuatu	TBC

We sincerely hope that you will be able to join us on this special occasion. Please confirm your participation via the online Registration Form: https://swap.virtualislandsummit.com/

Should you require any further information please refer to the attached concept note and agenda or visit the dedicated webpage: https://www.sprep.org/disaster-waste-management-workshop or contact Mrs Julie Pillet at juliep@sprep.org SWAP Project Coordinator or tooab@sprep.org, SWAP Technical Assistant.

Yours sincerely,

Easter Chu Shing
Acting Director General

Att.

JP/TB

CIRCULAIRE

DOSSIER : AP_6/15

À L'ATTENTION DE : Points de contact nationaux du PROE

DATE : 17 novembre 2022

CIRCULAIRE : 22/101

OBJET : **Invitation à participer à l'atelier en ligne sur la gestion de déchets issus de catastrophes naturelles – PROE/SWAP/J-PRISM II/PACWASTEPLUS : partage des expériences et enseignements tirés sur la gestion des déchets issus de catastrophes naturelles dans les îles du Pacifique 8 décembre 2022 – en ligne (sur Zoom) – 13h à 16h30 (heure des Samoa)**

Chers membres,

La fréquence et l'intensité des catastrophes naturelles, en particulier des cyclones tropicaux qui sévissent dans le Pacifique, augmentent, et lorsque ces catastrophes surviennent, de grandes quantités de déchets, appelés « déchets issus de catastrophes naturelles », sont produites par les dommages causés aux milieux naturel et anthropisé.

Ces catastrophes naturelles constituent un véritable défi pour les îles du Pacifique en raison de leurs effets négatifs sur l'environnement, la santé, l'économie et la société. Outre les risques non négligeables pour les biens et les personnes directement causés par les catastrophes, ces phénomènes peuvent générer une quantité importante de déchets qui, à leur tour, peuvent avoir un impact sur la santé, l'économie et/ou l'environnement.

Les îles du Pacifique sont particulièrement vulnérables aux impacts des déchets issus de catastrophes naturelles, ces dernières, telles que les cyclones tropicaux, devenant de plus en plus intenses et fréquentes.

Selon le *World Risk Report 2021*, trois des dix pays présentant le risque de catastrophe le plus élevé au monde se trouvent dans la région du Pacifique, le Vanuatu occupant la première place, les îles Salomon la deuxième et les Tonga la troisième place des pays les plus vulnérables aux catastrophes. Au total, six îles du Pacifique figurent dans le classement des 20 pays les plus exposés aux catastrophes naturelles.

Pour examiner la manière dont les îles du Pacifique (telles que les Samoa, les Tonga et le Vanuatu) ont fait face à la gestion des déchets issus des catastrophes naturelles, à travers les expériences et les enseignements tirés, le PROE, par l'intermédiaire du projet SWAP (*S'engager pour une gestion durable des déchets dans le Pacifique*) et en collaboration avec le projet J-PRISM II et le programme PacWastePlus, conduira un atelier en ligne, d'une durée de 3h30, le **jeudi 8 décembre 2022 à 13h (heure des Samoa)**.

Nous espérons sincèrement que vous pourrez vous joindre à nous en cette occasion spéciale. Pour toute information complémentaire, veuillez vous référer au document de réflexion et à l'ordre du jour ci-joints, ou consulter la page web dédiée : https://www.sprep.org/atelier-dechets-de-catastrophes-naturelles

Vous pouvez également contacter Mme Julie Pillet à l'adresse juliep@sprep.org, coordinatrice technique du SWAP, ou tooab@sprep.org, assistante technique du SWAP.

Veuillez confirmer votre participation via le formulaire d'inscription en ligne : https://swap.virtualislandsummit.com/.

Espérant vous compter parmi nos participants le 8 décembre 2022, veuillez croire en nos sentiments les meilleurs.

Sincères salutations,

Easter Chu Shing
Directrice générale par intérim

JP/TB

Appendix 3 – Registration Form

SPREP/SWAP/J-PRISM II/PACWASTE PLUS Online workshop on Disaster Waste Management: *Experience and lessons-learnt sharing on disaster waste management from the Pacific Islands*

Thursday 8th December 2022 – 1pm (Samoa time)

Atelier virtuel sur la gestion des déchets issus de catastrophes naturelles : *Partage d'expériences et d'enseignements sur la gestion des déchets issus de catastrophe naturelle dans les îles du Pacifique*

Jeudi 8 décembre 2022 – 13h00 (heure à Samoa)

ONLINE REGISTRATION FORM

Formulaire d'enregistrement en ligne

Description / Présentation:

To discuss how Pacific Islands (such as Samoa, Tonga and Vanuatu) have coped with managing disaster waste through lessons-learnt and experiences, SPREP, through the SWAP project in collaboration with the J-PRISM II project and the PacWaste Plus Programme, plans to conduct a three-hour virtual workshop to be held on **December 8th, 2022**.

This virtual workshop will be structured in three sessions:

- The first session will start the workshop with introduction of documents with a regional scope: Framework For Resilient Development In the Pacific and Disaster Waste Management Guideline;
- The second session will focus on national activities in Samoa, Tonga and Vanuatu; and
- The third session will close the workshop with knowledge sharing on how to strengthen Good Practices.

Afin de discuter de la manière dont les îles du Pacifique (telles que Samoa, Tonga et Vanuatu) ont abordé la gestion des déchets issus des catastrophes naturelles, à travers les enseignements et les expériences, le PROE, par le biais du projet SWAP en partenariat avec le projet J-PRISM II et le programme PacWaste Plus, organise un atelier virtuel de trois heures qui se tiendra le ***8 décembre 2022****.*

Cet atelier virtuel sera structuré en trois sessions :

- *La première session débutera l'atelier par l'introduction de documents ayant une portée régionale : Framework For Resilient Development In the Pacific et Disaster Waste Management Guideline ;*
- *La deuxième session se concentrera sur les activités nationales à Samoa, Tonga et Vanuatu ; et*
- *La troisième session clôturera l'atelier par un partage des connaissances sur la manière de renforcer les bonnes pratiques.*

Location/ Localisation :

The workshop will be delivered virtually. You will receive the Zoom link to join the workshop in the confirmation email after registration.

Note that we will be hosting in-country hubs for the workshop in the following countries:

- Samoa,
- Fiji,
- Vanuatu, and
- Tonga.

If you wish to attend in-person with other participants, if you are from one of our in-country hubs (mentioned above), we will provide the location for the in-person meeting room in the next few weeks.

L'atelier se déroulera de manière virtuelle. Vous recevrez le lien Zoom pour rejoindre l'atelier dans l'e-mail de confirmation après l'inscription.

Veuillez noter des salles ont été réservées dans les pays suivants afin de regrouper les participants s'ils le souhaitent :

- *Samoa,*
- *Fidji,*
- *Vanuatu, et*
- *Tonga.*

L'emplacement des salles de réunion sera communiqué dans les prochaines semaines.

Questions

1. Full name / Nom complet*

Please provide your name in the following format: Name Other Name FAMILY NAME
Veuillez indiquer votre nom dans le format suivant : Prénom NOM

2. Gender / Sex*
- Male / Homme
- Female / Femme
- Other / Autre

3. Date of birth / Date de naissance

4. Nationality / Nationalité*

5. Organization / Entreprise*

6. Title – Position in your organization / Fonction dans votre entreprise*

7. Address / Adresse

8. Post Code / Code postal

9. City / Ville

10. Country / Pays*

11. Telephone
+ (Country code) / + (indicative pays)

12. Email / Adresse mail*

13. What are your expectations from the workshop / Quelles sont vos attentes par rapport à l'atelier

14. Will you be attending in-person at one of our workshop in-country hubs in Samoa, Fiji, Tonga or Vanuatu?*
    - Options are as follows (single select)
        - Yes
        - No
        - Maybe

15. If you selected Yes in Q11, which in-country hub will you be attending in-person from?*
    a. Options are as follows (single select)
        - Samoa
        - Fiji
        - Tonga
        - Vanuatu

Appendix 4 – Contact details of registered persons

First Name / Prénom	Last Name / Nom de famille	Gender / Sex	Nationality / Nationalité	Organization / Entreprise	Title– Position in your organization / Fonction dans votre entreprise	Country / Pays	Email / Adresse mail	What are your expectations from the workshop / Quelles sont vos attentes par rapport à l'atelier
Janet	**Yocum**	Female / Femme	Asian	Federal Emergency Management Agency	EMS Response - Operations Planning	USA	Janet.yocum@fema.DHS.gov	Understand strategies for reducing waste
Nicc	**Moeono**	Male / Homme	Samoan	Moeono Energy Consultants	Managing Director	Samoa	moeonoenergyconsultants@gmail.com	
Chris	**Reiner**	Male / Homme	USA	US Environmental Protection Agency (EPA) Region 9	On-Scene Coordinator	USA	reiner.chris@epa.gov	
Angela	**Sandoval**	Female / Femme	USA	US EPA	Freely Associated States Circuit Rider Engineer	USA	sandoval.angela@epa.gov	
Timonie	**Hood**	Female / Femme	US	U.S. EPA Region 9	Zero Waste & Green Building Coordinator	US	hood.timonie@epa.gov	To learn about disaster debris planning and recovery experiences from island leaders to support EPA's work on disaster recovery and rebuilding.
Lola	**Tonga**	Female / Femme	Tongan	Waste Authority Limited (Tonga)	Manager Administration & Projects	Tonga	lola.liavaa.tonga@gmail.com	To network, hear about the work that's being done in other pacific countries and share information.
Andrew	**Paris**	Male / Homme	Fijian	University of the South Pacific	Researcher	Fiji	andrew.w.paris@gmail.com	Discuss salient and comprehensive management efforts to reduce disaster waste.
Roderick	**Lal**	Male / Homme	Fijian	Suva SUPers	Committee Member	Fiji Islands	rodericklal@icloud.com	To learn from everyone and also get a better understanding of how other countries are tackling disaster waste management
Laisani	**Lewanavanua**	Female / Femme	Fiji	Lewanavanua Environment	Sustainable Waste Management Specialist	Fiji	aleki4l@gmail.com	Learn and contribute to proper disaster waste management (such as application of 3Rs, special temporary storage site, development of guidelines, checklists, networking, etc)
Jimmy	**Gaunavou**	Male / Homme	Fiji	USP	Environment Health Safety and Sustainability Officer	Fiji	jimmy.gaunavou@usp.ac.fj	Disaster Waste Management Systems
Maria	**Vulavou**	Female / Femme	Fijian	Suva City Council	Health Educator	Fiji	maria.vulavou@scc.org.fj	Learnt more on how to manage waste after any disaster
Wijnand	**Udema**	Male / Homme	new zealand	GHD ltd	GHD ltd	New Zealand	Wijnand.Udema@ghd.com	
Sonia	**Chirgwin**	Female / Femme	Australian	GHD (TAS) -	Senior Environmental Consultant	Australia	sonia.chirgwin@ghd.com	Sharing of case studies and lessons, and information on practical ways to improve preparedness and response from a waste management perspective
Emma	**Newland**	Female / Femme	Fijian	GHD (Fiji)	Environment Team Lead	Fiji	Emma.newland@ghd.com	
Patricia	**Parkinson**	Female / Femme	Australian	Environmental Law Oceania Consultancy	Founding Director	Fiji	elocfiji@gmail.com	Learn more about the management of disaster waste especially from a policy and law perspective
Bomai	**Kobil**	Male / Homme	Papua New Guinea	PNG University of Technology	Tutor	Papua New Guinea	kobilbomai@gmail.com	Learn about ways to deal with climate change especially disaster risk management, Awareness and education.

Renee Regha	**Rario**	Female / Femme	Solomon Islands	Gizo Town Council , western Provincial Government	solid waste management officer/supervisor	Solomon Islands	reneerario@gmail.com	1. To learn from the case study of other pacific countries on how they control, manage and improve there DW 2. To learn on how and where to proper dispose such huge disaster waste 3. To know how Some hazardous wastes such as used oil or chemicals can spread and pollute the soil, rivers or the sea, groundwater, the atmosphere or even have health effects if not handled with care.
Nafiza	**Ali**	Female / Femme	Fijian	Nadi Town Council	Health Inspector	Fiji Islands	health@naditowncouncil.com.fj	Broden and enhance my knowledge on pac waste.
Dannielle	**Hamilton**	Female / Femme	Australian	Gympie Regional Council	Administration Waste	Australia	dannielle.hamilton@gympie.qld.gov.au	Learning how to better our waste department
Brenda	**Williams**	Female / Femme	Ni Vanuatu	USP	Student	Fiji	brendawlls4@gmail.com	
Craig	**Petersen**	Male / Homme	USA	US Coast Guard	Port Security Specialist	United States	Hawaiipetersen@gmail.com	
Jonathan	**Tafiariki**	Male / Homme	Solomon Islander	National Disaster Management Office	National Disaster Management Office	Solomon Islands	JTafiariki@ndmo.gov.sb	
Milinia	**Ramatalava**	Female / Femme	FIJIAN	I Taukei Affairs Board	I Taukei Affairs Board	Fiji	mcakau2011@gmail.com	To know more since this is the first time I join meeting such as this.
Filimone	**Lapaoo**	Male / Homme	Tongan	Department of Environment	Senior Environmentalist	Tonga	mone.lapaoo@gmail.com	Capacity Building on disaster waste management
Kailani	**Tupou**	Male / Homme	Tongan	Department of Environment	Assistant Conservation Officer	Tonga	ktupou010@gmail.com	To experience on how pacific islanders can overcome or face disaster waste after a tropical cyclone.
HIDEAKI	**MATSUOKA**	Male / Homme	JAPANESE	JAPAN INTERNATIONAL COOPERATION AGENCY	ENVIRONMENTAL MANAGEMENT GROUP	JAPAN	matsuoka.hideaki@jica.go.jp	
Shiro	**Amano**	Male / Homme	Japanese	JICA	Senior Advisor	Japan	amano46@gmail.com	
carlos	**miraldo**	Male / Homme	portuguese	SPC	SPC	Fiji	carloso@spc.int	
Iva	**Josivini**	Other / Autre	Fiji	Ministry of Environment	Environment Officer	Fiji	iva.josivini@govnet.gov.fj	Understand the opportunities for Pacific Island Countries to manage disaster waste
Kevin	**Johnson**	Male / Homme	New Zealand	SPC	Water Resources Support Specialist	Fiji	kevinj@spc.int	

Appendix 5 – Presentations

Appendix 5a – Framework for Resilient Development (FRDP) In the Pacific.

SPREP
Secretariat of the Pacific Regional Environment Programme

Framework for Resilient Development in the Pacific

SPREP
Secretariat of the Pacific Regional Environment Programme

Framework for Resilient Development in the Pacific

Leaders Decision

Within the margins of the 47th Pacific Islands Forum Leaders meeting In September 2016, the Framework for Resilient Development in the Pacific or FRDP was approved by Pacific leaders.

The FRDP is the overarching regional framework for climate change and disaster risk management, providing high level voluntary strategic guidance to different stakeholder groups.

In endorsing the FRDP, Leaders through the Pohnpei Statement: Strengthening Pacific Resilience to Climate Change and Disaster Risk, called on all **development partners, the private sector and civil society to join with Pacific Islands Countries and Territories** to support the principles and the implementation of this statement through high-level participation in a new Pacific Resilience Partnership which was established in September 2017.

SPREP
Secretariat of the Pacific Regional Environment Programme

Framework for Resilient Development in the Pacific

What is the FRDP?

An integrated regional framework on climate change and disaster risk management supported by Pacific Island Forum Leaders in 2012.

- Pacific Disaster Risk Reduction and Disaster Management Framework (a.k.a. Regional Framework for Action or RFA)
- Pacific Islands Framework for Action on Climate Change (PIFACC)

Is a guideline for voluntary actions for all stakeholders

PURPOSE

Provides high level strategic guidance to different stakeholder groups on how to ***'enhance resilience to climate change and disasters, in ways that contribute to and are embedded in sustainable development'***

SPREP
Secretariat of the Pacific Regional Environment Programme

Framework for Resilient Development in the Pacific

Pacific Resilience Partnership

Governance Structure

PRP Task Force

Consists of 15 Members and 13 Alternate Members representing Countries and Territories, Regional Agencies and Development Partners, Civil Society and the Private Sector

Over 100 Affiliated members

PRP Support Unit

SPREP, SPC, and PIFS

Effectively support the Task Force achieve its objectives, coordinate and facilitate the biennial Pacific Resilience Meeting (PRM).

Provision of coordinated and coherent policy and technical advice

Technical Working Groups

5 TWGs established since 2019: (a) Disaster Risk Finance (b) Human Mobility © Risk Governance (d) Information and Knowledge Management and (e) Localization

There is also a Communications and Engagement Standing Committee (CESC)

Biennial Pacific Resilience Meeting

The PRM is convened biennially to showcase resilience initiatives undertaken in the Pacific region.

It brings together practitioners from various stakeholder groups and has demonstrated that resilience building can be enhanced through genuine partnership

SPREP
Secretariat of the Pacific Regional Environment Programme

Framework for Resilient Development in the Pacific

FRDP: Goals

GOAL 1

Strengthened integrated adaptation and risk reduction to enhance resilience to climate change and disasters .

GOAL 2

Low carbon development

POTENTIAL: Circular Economy, Waste to Energy

GOAL 3

Strengthened disaster preparedness, response and recovery

POTENTIAL: Post-Disaster Waste to Energy

Elevating Waste to the FRDP

Entry points:

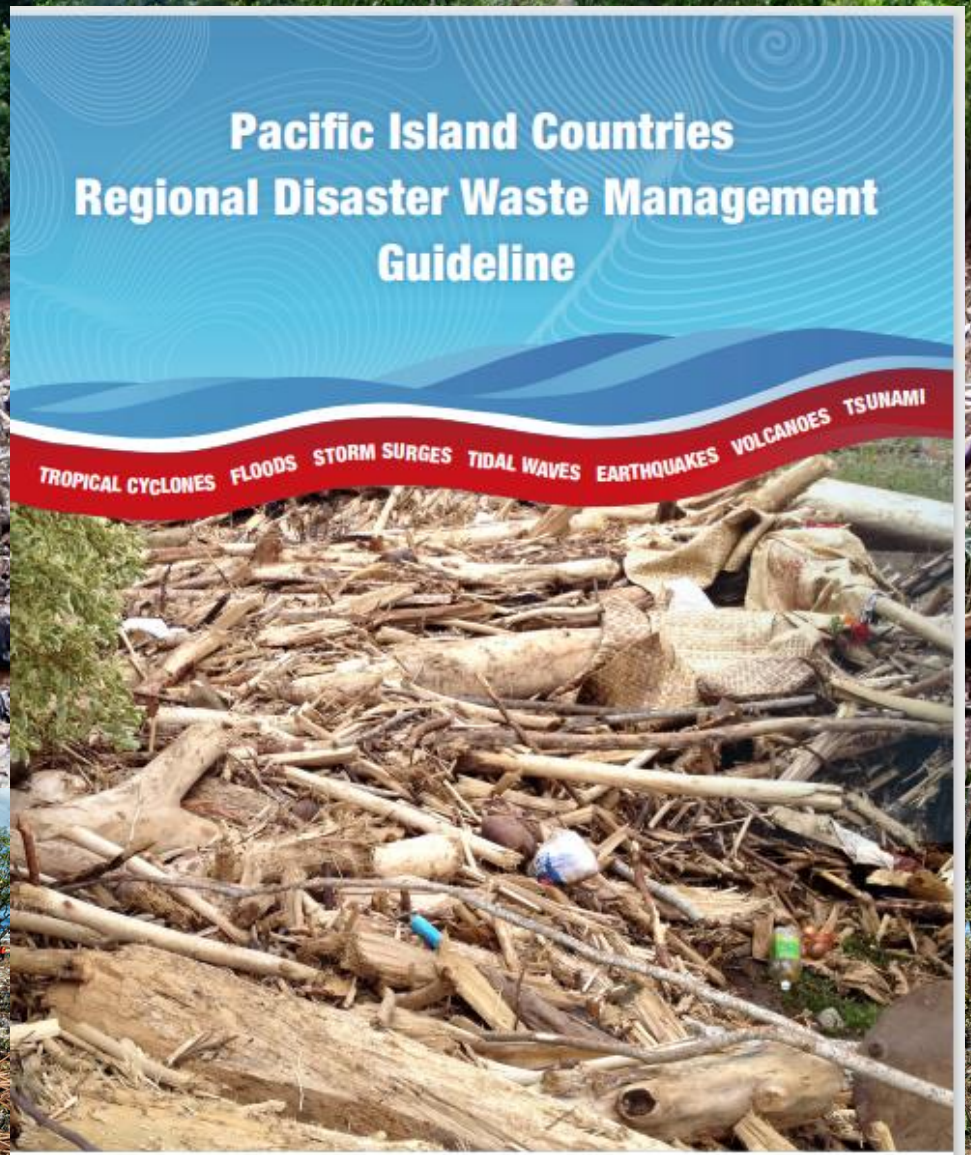
- Main focus on Goal 3
- Established Technical Working Group under PRP

Partnerships and synergies: existing members/affiliates and/or extensive networks

SPREP
Secretariat of the Pacific Regional Environment Programme

Thank you! and Malo ‘aupito

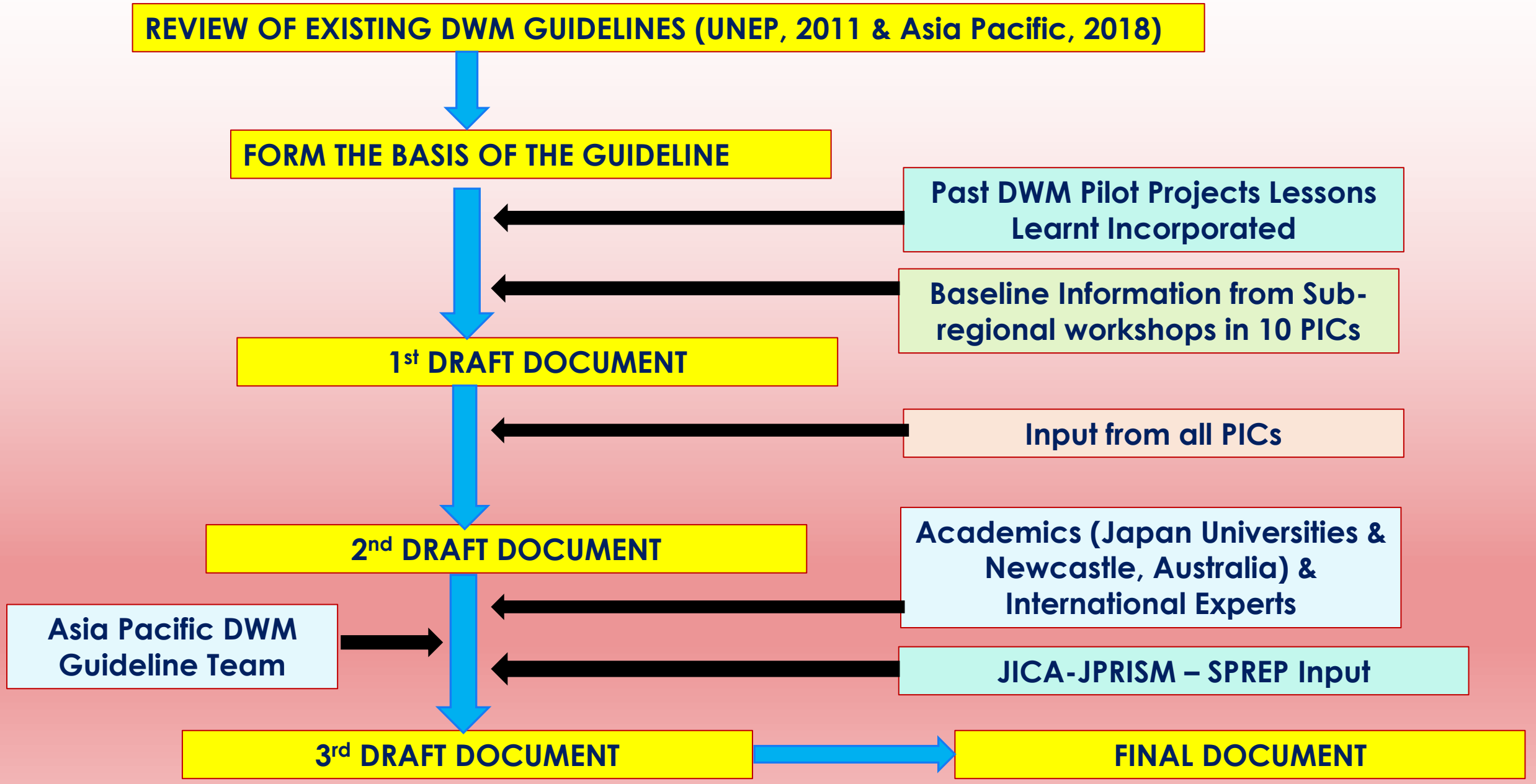
Appendix 5b – Disaster Waste Management Guideline.



The Regional Disaster Waste Management Guideline

JICA JPRSM SPREP PROE

1.0. DEVELOPMENT OF THE GUIDELINE



2. PURPOSE, OBJECTIVES & GOAL

2.1. Purpose:

To provide guidance on applicable and appropriate DWM measures to PICs, considering the PICs issues and challenges.

2.2. Objectives:

1). Mainstreaming Disaster Waste into PICs` National Disaster Management Planning process for improved national coordination of preparedness, response and recovery operations.

2). Improving the supporting institutional arrangements & support.

Goal: Improved PICs DWM Capacity



3.0. RATIONALE FOR DEVELOPING THE REGIONAL DWM GUIDELINE

1). It is one of the activities under the Regional Waste Management Strategy 2025 (Cleaner Pacific 2025).

2). PICs are highly exposed and vulnerable to natural hazards like tropical cyclones, floods, volcanoes, tsunami, etc., and managing the generated waste is a challenge.

3). To promote the management of Disaster Waste in PICs based on international accepted practices, measures and approaches.




POLICE

4.0.HOW THE GUIDELINE WILL HELP PICS

4.1. Enhanced skills and knowledge of PICs on DWM measures promoted under the following stages and timeline of a Disaster event:

- Prevention & Mitigation
- Preparedness
- Response

BEFORE DISASTER

- Recovery
- Reconstruction.

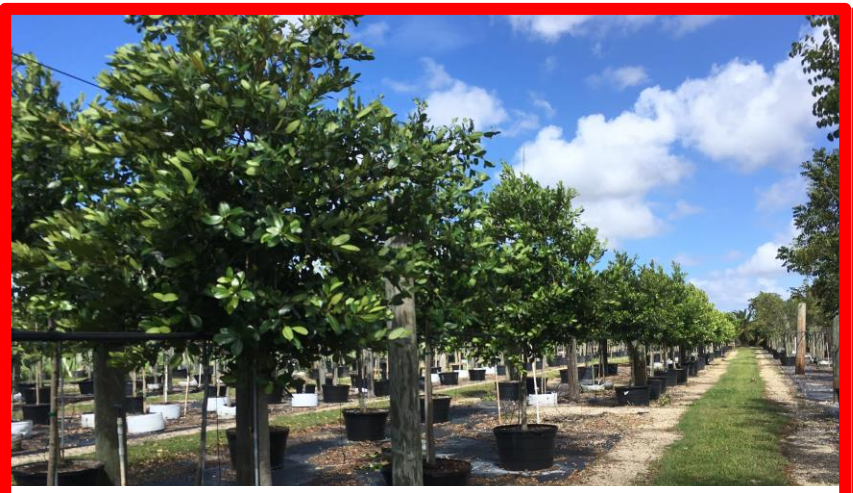
AFTER DISASTER

5.0. HOW THE GUIDELINE WILL IMPROVE PICS CAPACITY

5.1. Prevention & Mitigation Measures - examples

Promoting sourcing in the country of relief goods if possible – Water bottles, etc. , use of local options

Regular maintenance of large trees along public roads



Using local wind resistant trees in future urban landscaping works

Management of any existing asbestos roofing issues

5.2. Preparedness Measures

a). Promoting the improvement of Existing Waste Management Systems and Services – examples

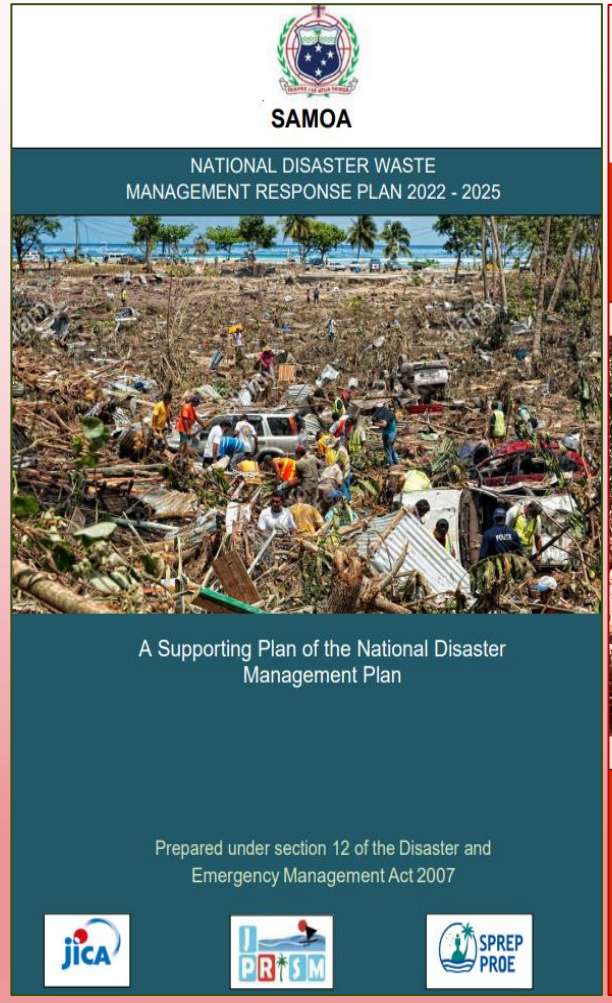
Disposal Site Access Road Maintenance before the Cyclone Season

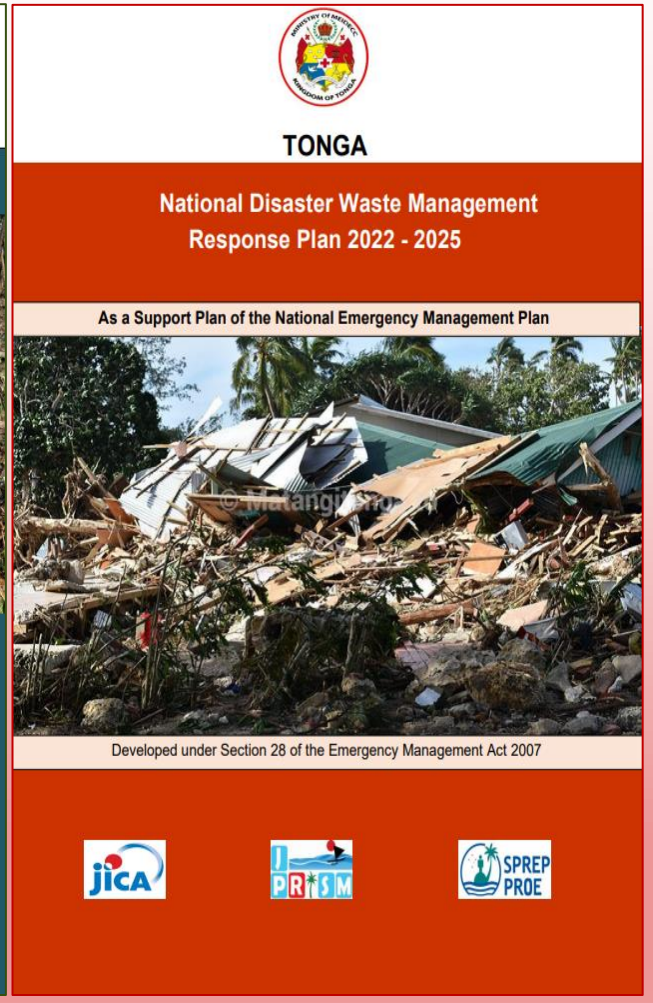
Existing Waste Services Improvement

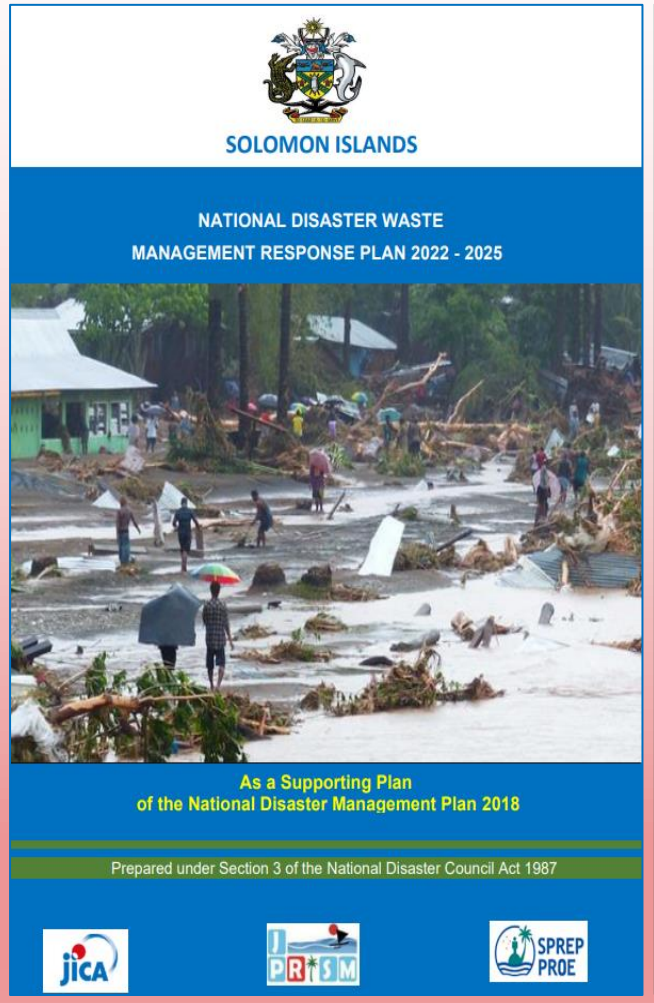
b). Integration of DWM in PICs National Disaster Management Plans

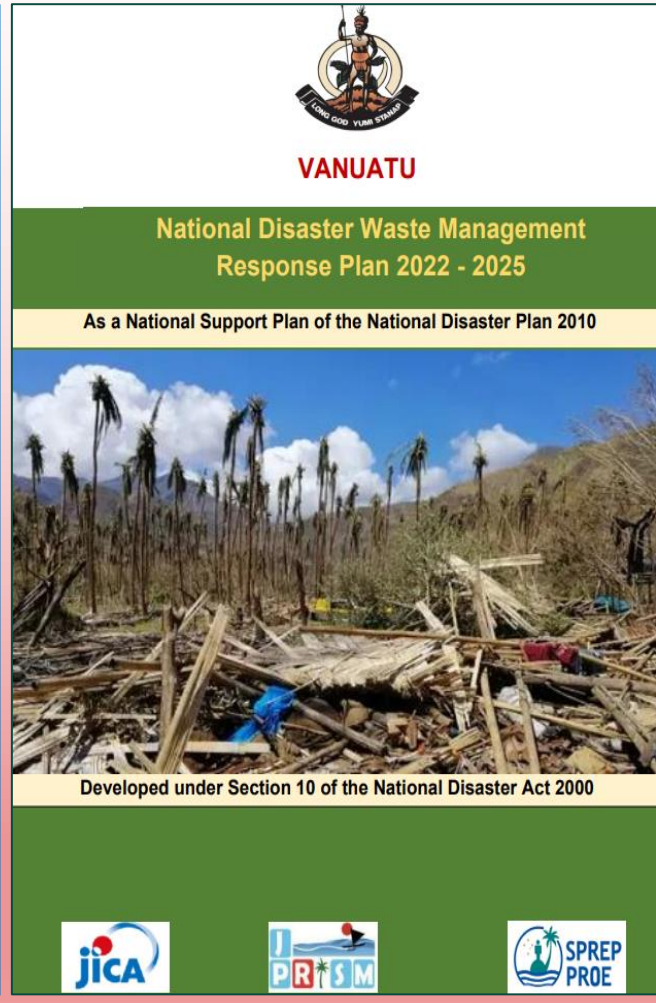
- Through the **development of National Disaster Waste Management Plans** for the countries. E.g. Samoa, Tonga, Vanuatu and Solomon Islands.
  - As **a supporting plan** to existing National Disaster Management Plans.
  - As **an instrument to mainstream disaster waste to all sectors**, agencies and stakeholders for their contribution.
  - **Establishment of a Disaster Waste Cluster or sub-cluster**

c).Developed Draft National DWM Plans – Samoa, Tonga, Solomon Islands and Vanuatu









d). Developed Supporting Awareness and Educational materials

ISSUE NO. 1 MAY 2022

DISASTER WASTE MANAGEMENT

TECHNICAL GUIDANCE BASED ON THE REGIONAL DISASTER WASTE MANAGEMENT GUIDELINE 2022

DWM PREPAREDNESS – READINESS CHECKLIST

During our preparation for the upcoming cyclone season this year, this checklist can help you to understand the current level of your waste management system and facilities readiness to respond during disasters.

1. COLLECTION SERVICES

- All households are covered. Arrangements are made for businesses and organizations.
- For areas without collection service, guiding information on disaster waste management measures is provided (refer Annex 11 of the Regional DWM Guideline for more information).
- The collection trucks are in good operating conditions. Spare parts are available for needed maintenance.
- Collection staff and workers receive training and have full PPE sets.

2. DISPOSAL FACILITIES

- Official disposal sites are in good operational condition.
- Maintenance operations are ongoing.
- Adequate space is available for waste during disaster events.
- Access roads are well maintained and can be accessed during rainy days.
- Arrangements are made for temporary waste storage sites and can be activated if needed.
- Arrangements for the recovery of recyclable and reusable waste are made with recyclers and other interested stakeholders.
- Arrangements are made for backup maintenance heavy equipment if needed during recovery operations.

FOR MORE INFORMATION, REFER TO ANNEX 10 OF THE REGIONAL DWM GUIDELINE

Produced by: Japanese Regional Technical Cooperation Project for Promotion of Regional Initiatives on Solid Waste Management in Pacific Island Countries (JPRISM Phase 2).

3. PUBLIC AWARENESS

- Contact information of waste management agencies can be easily accessed by members of the public if needed.
- Information on collection service schedules and opening hours of waste disposal facilities is available online and other means. E.g. Social media, newspapers, etc.
- Guiding information on what to do after disaster events for any generated disaster waste is available and can be accessed by members of the public.
- Information for areas without waste management services has been provided to the communities (refer Annex 11 of the Regional DWM Guideline).

4. SUPPORTING INSTITUTIONAL ARRANGEMENTS

- Integration of Disaster Waste into the National Disaster Management Plans.
- A National Disaster Waste Management Contingency Plan is endorsed and enforced.
- A special group of government agencies and stakeholders is designated for DWM. E.g. Committee, sub-cluster, etc.
- Key officials and staff are trained and have the skill to conduct disaster waste assessment and use different waste estimation methodologies to estimate disaster waste.
- Supporting resources are made available for DWM. E.g. Government budget, etc.

USE THIS AS THE BASIS OF YOUR DWM PREPAREDNESS FOR THE UPCOMING CYCLONE SEASON

For more information and queries about this DWM Flyer, contact us: fauhelelo2018@gmail.com

ISSUE NO. 2 JULY 2022

DISASTER WASTE MANAGEMENT

TECHNICAL GUIDANCE BASED ON THE REGIONAL DISASTER WASTE MANAGEMENT GUIDELINE 2022

https://www.sprep.org/publications/pacific-island-countries-regional-disaster-waste-management-guideline

DETAILED MEASURES FOR MANAGING SOME CHALLENGING DISASTER WASTE STREAMS

Here is the additional and detailed information on the management of some identified disaster waste streams included in the Regional Disaster Waste Management Guideline 2022. These are some examples of the complex disaster waste streams to manage with important information on how to manage during disaster events.

DISASTER WASTE	ADDITIONAL INFORMATION	COLLECTION	DISPOSAL	REUSE / RECYCLE
1. Expired or declined relief supplies & contaminated shop supplies. 	• Disaster relief supplies that are expired, damaged or declined due to incomplete import documentations. • Shops contaminated and damaged food supplies, which are not accepted to sell to customers. E.g. Bags / sacks of rice, sugar and flour. Boxes of canned foods, freezer goods, etc. 	• Owners of the generated waste (E.g. Government agencies, businesses, etc., to load and transport using trucks or trailers depending on the amounts. • Dump trucks must be used for easier unloading at the disposal sites, especially for large sacks of flour, sugar, etc. Using of non-dump trucks may lead to workers' fatigue and health issues if manually unloaded during disposal operations. • The disposal operations at the waste disposal sites must be guided by the existing national laws and guidelines. E.g. Supervision by the Ministry of Health, etc. • The government agency responsible for the waste disposal sites management must be informed in advance before any loads are transported to the site for appropriate guidance, arrangements, and site preparations.	• Excavating a 2-5m deep, 2-3m width and 2-5m length depending on the amounts of waste to be buried. • The disposal of all items especially food waste must be based on national laws and guidance. E.g. Tear and open up the contents of all bags, sacks and boxes and disposed of in the pit, to ensure they are not recovered for consumption by the waste pickers. • Fill the pit with the waste up to at least 1m below the surface, leaving that space for backfilling using the excavated earth materials. • Cover the pit with topsoil and compact it to avoid any chance of digging by stray dogs, especially if there are freezer goods like raw meats.	• Not applicable
2. Carcasses  	• Dogs, pigs, cats, chickens, fishes, cows, etc.  	• Manually collect small items like chickens, fishes, piglets, etc., and put in plastic rubbish bags. Move the bags and load on to a designated vehicle for transportation to the disposal site. • If the carcasses are to be disposed of within the same area (in the absence of a designated disposal site or when moving to a disposal site is not practical), move the bags and place at the location identified for disposal. Within farm areas if allowed under national laws, use a loader to move large animals like cows to the identified area for burying. • Use a wheel loader or a similar equipment to collect and move around large carcasses like cows, horses, etc., to a truck for transportation to a designated disposal site, or an identified site within the area (for remote areas and islands without disposal sites OR when transportation to the designated disposal site is not practical. • For carcasses from diseases like bird flu, etc., special care must be taken to avoid contact with the animals, blood, etc. Full PPE must be worn. Disinfections must be applied to clean the vehicles, equipment and tools being used to collect and transport the carcasses.	• For islands with no disposal sites, the communities must designate an area especially for large amounts of carcasses from tsunami and oil spills. E.g. Fishes, etc. • Excavating narrow and long pits for easier burying operations, depending on the amounts of carcasses and type of animals. This is critical if the disposal site is secured from public entry and stray dogs. • The disposal of carcasses must follow national laws and guidance especially if the identified site is not the official designated disposal site. Location of the disposal pits from underground and surface water sources is a factor to consider. • Incineration is an option if there are available facilities with the adequate capacity. **Useful specific information is provided at the following link for burying different animals within farm areas.** http://oma/ha.gov.on.ca/english/engineer/facts/09-029.html1	• Composting is an option but if the site cannot be secured from stray dogs as a major issue in some Pacific Islands, then this option may not be the best option. **Additional important information on animal carcasses composting.** https://www.nrcu.edu/content/dam/nrcu/sustainability/publications/composting-dead-livestock.pdf

ISSUE NO. 4 OCTOBER 2022

DISASTER WASTE MANAGEMENT

TECHNICAL GUIDANCE BASED ON THE REGIONAL DISASTER WASTE MANAGEMENT GUIDELINE 2022

https://www.sprep.org/publications/pacific-island-countries-regional-disaster-waste-management-guideline

SPECIFIC MEASURES FOR REMOTE ISLANDS WITHOUT WASTE MANAGEMENT FACILITIES

There are several areas in Pacific Island Countries with no proper waste management facilities (i.e. collection, disposal, recycling, etc.) due to their remote locations. In the absence of appropriate waste management facilities, the following measure can be used to manage the generated disaster waste during disaster events.

DISASTER WASTE	DETAILS	MEASURES
1. Green Waste	Wooden parts - Stems - Branches	Cut in small sizes and stockpile for firewood supplies to support traditional cooking methods.
	Leaves	Apply as mulching to suppress weeds around garden and farming areas e.g., banana trees, taro, etc.
	Fruits	Fallen coconuts and breadfruits can be stockpiled and use for pigs' feeds.
2. Building Materials	Iron roofing	Stockpile the less damaged ones for reuse to rebuild damaged houses.
		Stockpile the partly damaged ones for fencing works for gardens protection from pigs, etc., or for containing pigs safely.
	Timber	Less damaged can be reused for houses rebuilding works.
		Badly damaged ones can be stockpiled as firewood. N.B. treated timbers must not be used for cooking purposes.
	Roofing materials from coconut, palm, pandanus and other plant materials.	Use as mulching materials to suppress weeds at gardening areas.
	Rubbles	Stockpile and reuse for rebuilding works, to fill foundation areas or to reclaim any eroded lands.
3. Plastics	Bags from relief support	Reuse as much as possible. Damaged ones must be buried.
	Bottles from supplied water supplies	Reuse as much as possible for water refill or for storage of cooking oil, cooking soy sources, etc.
	Styrofoam and others.	Stockpile and bury at the waste burial area.
4. Cardboard and Paper	Boxes from supplied relief support	Reuse as much as possible for storage purposes in the house. Damaged ones can be laid at gardening areas to suppress weeds. They get wet and breakdown easily. Other papers can be stockpiled to use to start fire for traditional cooking purposes.
5. Textiles	Wet clothes and other families properties	Wash and reuse as much as possible. Damaged ones can be stockpiled after washing and reuse to sew handicrafts including floor mats, bedsheets, table covers, etc.
6. Nappies	Used by infants and adults	Bury at an area identified for the family disposed waste (at the back of the house for easier access).
7. Volcano Ashes	Rocks and tiny particles	Stockpile and dispose of at back of household lands or bury under existing sandy area to control dusts.
8. Asbestos	Roofing or wall materials	Wet, wrap with plastics if available and bury at an identifiable area for removal in the future if potential service is available later for proper disposal.
9. Animal carcasses	Dead pigs, dogs, cats, fishes, etc.	Bury properly

Produced by: Japanese Regional Technical Cooperation Project for Promotion of Regional Initiatives on Solid Waste Management in Pacific Island Countries (JPRISM Phase 2).

JICA SPREP

e). Setup of DWM Assessment System

- **Establishment, piloting DWM data collection system with training**:
  - Tonga in collaboration with Waste Authority Limited.
  - Solomon Islands in collaboration with MECDM and HCC.
  - Samoa in collaboration with MNRE.
  - Vanuatu in collaboration with DEPC and Port Vila City Council.

5.3. Emergency Response

- **Rapid Assessment & DW Issues Mapping then follow up actions to identified priority issues**

Rapid Assessment & DW Mapping

Road Clearance

Containing any hazardous waste

5.4. Recovery Measures

- Implementation of actions to recover reusable and recyclable waste

Recovery of Reusable Waste for the affected communities

Recovery of Recyclable waste for recycling purposes

❑ Recovery Measures – Restoration of Cleanliness

Collection and Disposal of the remaining DW

After Cleaning Operations

❑ Reconstruction – Namara Landfill, Labasa, Fiji in 2014

BEFORE IMPROVEMENT WORKS

AFTER REHABILITATION

❑ Reconstruction – Bouffa Landfill, 2015, Port Vila, Vanuatu

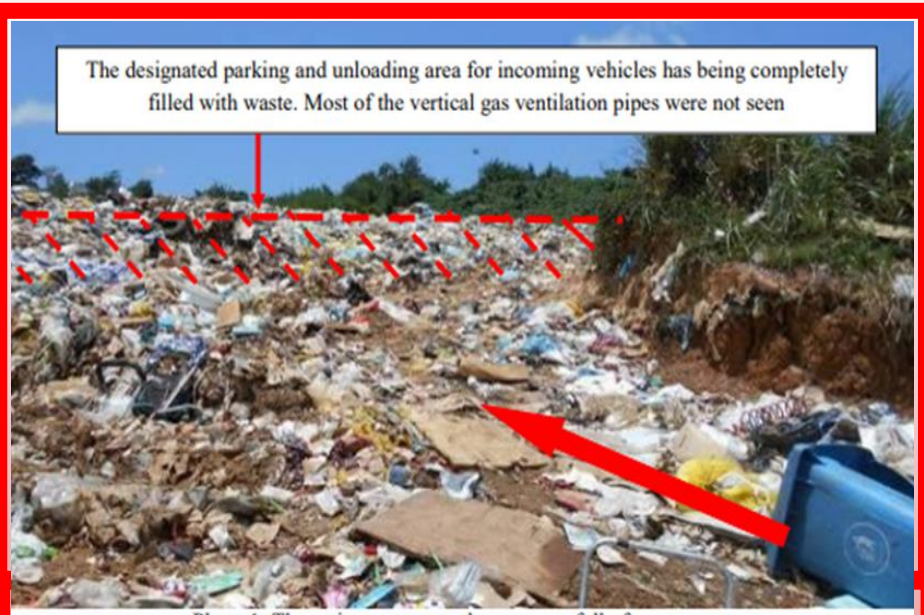
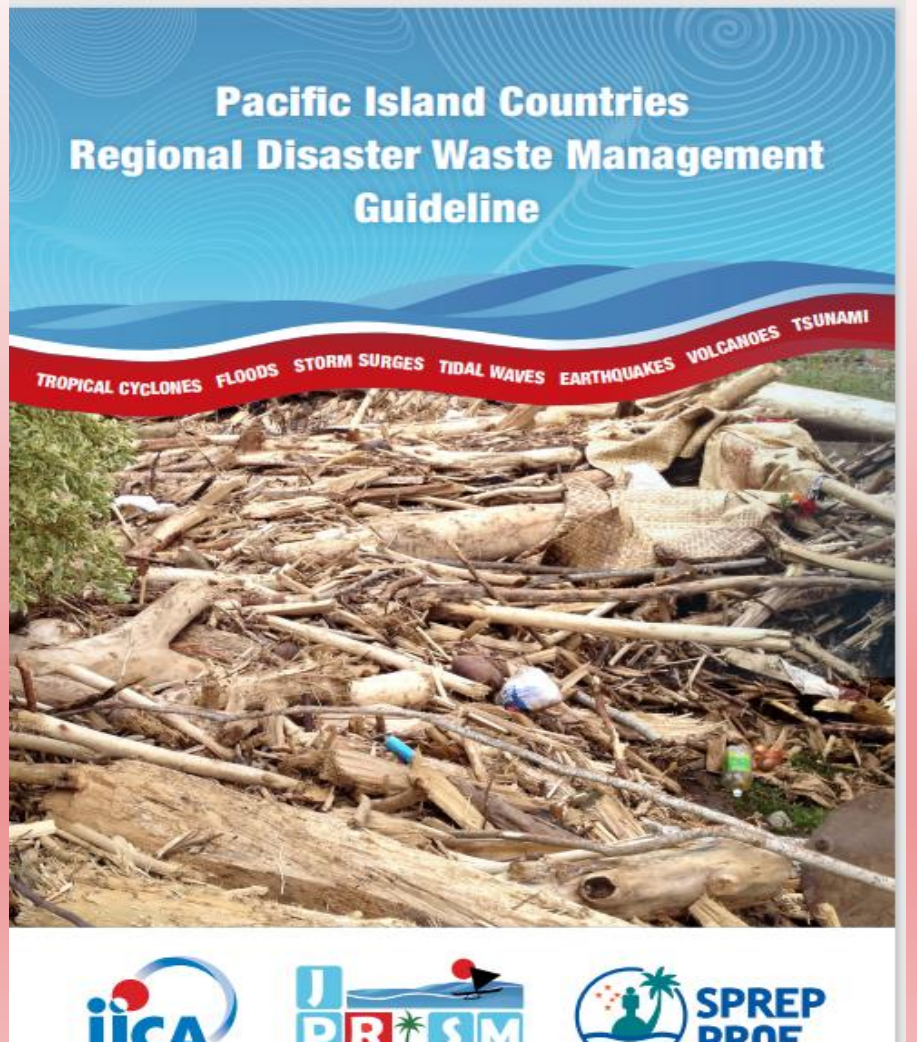


Photo 1: The main entrance to the area was full of waste

THANK YOU


Pacific Island Countries
Regional Disaster Waste Management
Guideline
TROPICAL CYCLONES
FLOODS
STORM SURGES
TIDAL WAVES
EARTHQUAKES
VOLCANOES
TSUNAMI

Appendix 5c – Samoa Disaster Waste Management Plan (DWMP).

Ministry of Natural Resources and Environment
Matagaluega o Punaoa Faalenatura ma le Siosiomaga

SAMOA's DRAFT NATIONAL DISASTER WASTE MANAGEMENT RESPONSE PLAN

SPREP/SWAP/J-PRISM II/PACWASTE PLUS
DISASTER WASTE MANAGEMENT WORKSHOP
8 December 2022

SECTION 1:
BACKGROUND INFORMATION LEADING TO THE NATIONAL DISASTER WASTE MANAGEMENT (DWM) RESPONSE PLAN

1. Necessity for the DWM Response Plan

- Samoa is vulnerable and highly exposed to natural hazards.
- Frequent tropical cyclones and floodings in recent years.
- Potential occurrence of devastating earthquakes, volcanoes with subsequent tsunamis anytime today, tomorrow and in the future.
- These hazards when occur are destructive causing lots of damages to our surrounding environment, houses, properties and belongings.
- All these damages represent the generated waste that needs to be managed by everyone in a coordinated manner.
- Delays in providing immediate waste management collection and disposal services can further degrade the affected surrounding environment, people`s health and the economy.

- Destructive cyclones, earthquakes, volcanoes, floods and tsunamis can generate overwhelming amounts of waste that are beyond our normal capacity to deal with.
- The nature of the waste with the overwhelming volume, small to large sizes, and potential toxic nature makes their management complicated and expensive.
- Our government funded waste collection and disposal services are designed for the normal generated waste. To include disaster waste in the provided services by contractors will need additional funds and supporting resources.
- Waste related operations are performed by several government agencies and businesses (MNRE, MOH, SWA, MAF, LTA, etc.; recyclers, private sewage collection services, etc.) as part of the waste management system in the country.
- These services can be affected during disaster events and need to be quickly restored to continue their waste management related functions.
- Any impact to the services provided by different agencies and businesses during disaster events affects and disrupts the functional status of the overall waste management system in the country resulting to environmental and health impacts.

Examples of the typical generated disaster waste - Destructive Tsunami (Samoa, 2009)

Examples of the generated disaster waste - Destructive Floods

Examples on the generated disaster waste - Cyclones

Examples on the generated disaster waste – Volcanoes

Examples on the generated disaster waste - pandemic

Example of the Generated Disaster Waste - Disaster Response and Recovery Operations

2. Available Guidelines on Disaster Waste Management

- **International guidelines are available for the management of disaster waste.**
  - ✓ UNEP Disaster Waste Guideline 2011.
  - ✓ Asia Pacific Disaster Waste Guideline 2018 (Development was led by Japan`s Ministry of Environment).
  - ✓ Pacific Regional Disaster Waste Guideline 2022 (Development was led by JICA –JPRISM 2 Project).
- **All guidelines promote the integration of disaster waste management in national disaster management plans** for better coordination and support from government, govt agencies, development partners and all stakeholders.

2.1. DWM Guidelines - Response Measures Objectives

- **Gathering some information on the generated waste (rapid assessment)**
  - ✓ Identify any risk to people and the environment, map locations, provide measures to temporary contain the risks for follow up actions.
  - ✓ Hazardous waste materials and substances for quick containment.
  - ✓ Clearance of blocked public roads to allow vehicles movement for lifesaving operations and relief support operations.
- **Follow up operations to temporary manage the identified risks.**
  - ✓ Clearance of blocked roads.
  - ✓ Seal off any area with suspicious asbestos, chemical and oil spills, etc.
  - ✓ Collection of animal carcasses before they get smelly.
- **Follow up detailed assessment for recovery operations planning, which provide some answers to:**
  - a). What to do next?
  - b). Who will do it?
  - c). What supporting resources needed?
  - d). How much and where to get it from?

2.2. DWM Guidelines - Recovery Measures Objectives

- **Quick restoration of cleanliness to the affected areas (the earlier the better for the victims & early sign of normalcy restoration although it takes time to rebuild from disasters).**
  - Safe removal, transportation and disposal of earlier contained waste risks - hazardous waste.
  - Collection, transportation and final disposal of the rest of the generated waste.
  - Onsite or offsite recovery of recyclable and reusable waste for recycling and reuse.
- **Restoration of affected waste management facilities.**
  - Resume affected waste collection & disposal services.
  - Rebuild damaged waste facilities with Build Back Better aspects included. E.g. repair trucks, incinerators and landfill facilities, etc. (applicable to gov`t agencies with government waste facilities (MNRE, MOH, SWA, MAF, etc.

SECTION 2: DRAFT DISATER WASTE MANAGEMENT RESPONSE PLAN

2.1. Purpose

- To provide detailed response plan and actions to ensure effective management of disaster waste based on international and regional disaster waste management guidelines.
- Outline key roles and responsibilities of the key government agencies/stakeholders based on their existing waste management related functions as government agencies and supporting partners.
- Highlight coordination and communication processes, mobilization of resources for effective execution and implementation based on NDMO processes.

2.2. Key Objectives

- Mainstreaming disaster waste management into the National Disaster Management Plan.
- Promoting appropriate disaster waste management practices in line with regional and international guidelines.
- Enhance national coordination of disaster waste response and recovery operations
- Sharing of resources and avoid duplication of efforts
- Securing of supporting resources for restoring cleanliness and affected waste management facilities to resume essential waste services.

2.3. Legal basis

- **National Disaster Management Act 2007**

Part A, Section (1)

….authorise the Disaster Advisory Committee to "invite any agency or organization to develop a disaster management plan' which may 'become a part of the National Disaster Management Plan'.

Part 4 (12) (1) and (2)

…requires every designated Response Agency to prepare Response Plan based on the following aspects:

(a) Identify the types of disasters or emergencies likely to require a response by the agency and the nature of the anticipated effects of the disasters or emergencies on the agency;

(b) Identify activities and procedures aimed at reducing risks and minimizing the impacts of any disaster or emergency on the operations of the agency

(c) Include an implementation plan in relation to the matters identified under paragraphs (a) and (b)

(d) Plan for the speediest possible recovery

Part 4 (12) (1) and (2)

…requires every designated Response Agency to prepare Response Plan based on the following aspects:

(a) Identify the types of disasters or emergencies likely to require a response by the agency and the nature of the anticipated effects of the disasters or emergencies on the agency;

Waste Management Act (WMA) 2010

- Overarching and Principal Act for overall management of waste (all types of waste)
- Authority to assign waste collection areas, official disposal sites, contractors to deliver these waste services
- Development of national waste management plans, policies, regulations, national standards, promotion of recycling, enhancing public awareness etc.
- Critical for the management of disaster waste

2.4. Scope

- Covers extremely and hazards (high) as identified in the National Disaster Management Plan 2017-2020 (under revision)
- Focus on the specific response actions to manage disaster waste when disasters/hazardous occur
- Key hazards (Refer to Table)

Key Hazards in line with the National Disaster Management Plan 2017 - 2020

Hazard	Level of Risk	Estimate Period of Occurrence
1. Cyclone[2]	Extreme	November - April
2. Volcanic Eruption	Extreme	Unpredictable
3. Tsunami	Extreme	Unpredictable
4. Urban Fire	Extreme	Unpredictable
5. Public Health Crisis[3]	Extreme	Predictable
6. Flood[4]	High	November - April
7. Earthquake	High	Unpredictable
8. Landslide	High	November - April
9. Forest Fire	High	May - October

2.5. Link to other key Plans

- Regional Disaster Waste Management Guidelines 2022
- National Waste Management Strategy 2019-2023
- National Healthcare Waste Management Strategy 2020-2025
- National Marine Spill Contingency Plan 2009
- Technical Guidance to Covid-19 Waste Storage, Collection & Disposal
- Technical Guidance to Asbestos Containment & Removal

2.6. Key stakeholders & Lead Agencies

- MNRE: Cyclone, Flood, Earthquake, Volcano & Tsunami
- MOH: Public Health Crisis, Pandemic
- MWTI: Landslide, vessel and marine oil spill
- SFESA: Fire (Urban and Forest with MNRE-FOR)

Above agencies are designated response agencies for the different hazards covered under this response plan.

Agencies with Waste Management Related Functions

- MNRE – Government solid waste collection services & two waste disposal sites in Upolu and Savaii
- MOH - Collection of healthcare waste from hospitals & operation of two waste incinerators in Upolu and Savaii
- SWA - Sewage Treatment Plant at Sogi.
- MFA - Quarantines Incinerators Operations.
- MWCD – Village clean-ups coordination, NBC
- MOF – End of life assets, electronics etc
- STA – Waste collection from tourism developments & resorts

2.7. Resource Mobilization

- Contribution as part of the different agencies and stakeholders waste management functions as listed in the Plan
- Support from development partners similar to previous contributions as summarized in the Plan
- Supporting budget from the government (collection and disposal services)
- Supporting budget as part of the National Disaster Recovery Plan for recovery efforts

2.8. Communication process

- Sharing of the Plan
  - ✓ Share and distribute to all members of the Council, NDC, Government, Stakeholders
  - ✓ Level of awareness, support and better coordination
- Communication relating to the Plan Implementation
- Communication must follow standard procedures with DWC prior to reporting to NDMO and should follow NDMO's communication process

Approval, Activation, Review & Coordination

- Under National DMO in line with **Disaster Management Act 2007**

- **Proposal:**

✓ Establishment of Disaster Waste Committee

✓ Existing National Coordinating Committee (WM Strategy)

✓ Groundwork coordination (Technical)

Thank you for your attention

Appendix 5d – Vanuatu Community Project on Vanuatu's DW response to communities following the Tropical Cyclone Harold in 2020.

VANUATU DISASTER WASTE MANAGEMENT INITIATIVES TC Harold RESPONSES and CHALLENGES

Ms Roselyn Bue

Environmental Protection Division

Department of Environmental Protection & Conservation (DEPC), Vanuatu

PREPAREDNESS

Policy Development:

1st Disaster Waste Management Training in November 2019 to pilot the Regional Disaster Waste Management tool kit

Acknowledgment: Canadian Government for funding the training through the joint coordination of SPREP, JICA J-PRISM II Project, and the University of Newcastle.

Follow up workshop from the training with the main goal to develop Vanuatu's National Disaster Waste Management Contingency Plan

Acknowledgment: SPREP and J-PRISM II Team Experts for their commitment to undertake this task jointly with the Government of Vanuatu.

The workshop provided an overview of relevant stakeholder roles in terms of Disaster Waste Management during a Disaster. Disaster Waste Contingency Plan to be finalised by November 2020 or earlier.

TC HAROLD RAPID DISASTER WASTE ASSESSMENTS

Conducted on Sanma Province and Penama Province:

- **Santo Island** – Luganville, Show Ground, Banban, Butmas, Fanafo, South Santo
- **Malo Island** – West Malo
- **Aore Island** (Visual on the way to Malo Island)
- **Pentecost Island** – South Pentecost and Central Pentecost 2

At all locations, majority of waste was Green Waste and Building Debris including bulky wastes such as iron roofing's, timber etc.

RECOVERY ACTIVITIES POST TC HAROLD

Location	Recyclables (m3)	Bulky Waste (m3)	Non-Recyclable Waste (m3)	Total Disaster Waste (m3)
Banban (Santo)	8.9	17.5	26.1	52.5
Show Ground (Santo)	2.4	98	35	135.4
Chapuis (Santo)	14.6	8.0	18.1	40.7
Solway (Santo)	3.3	0.5	1.7	5.5
Pangi (Pentecost)	3.2	-	0.2	3.4

RECOVERY ACTIVITIES POST TC HAROLD

Location	Recyclables (m3)	Bulky Waste (m3)	Non-Recyclable Waste (m3)	Total Disaster Waste (m3)
Vasemakul (Pentecost)	0.2	-	0.2	0.4
Waterfall (Pentecost)	-	-		-
George Lini Plantation (Aore, Santo)	0.2	-	0.2	0.4
Waisale (Malo, Santo)	0.2	-	0.2	0.4
TOTAL	33	124	81.7	238.7

CHALLENGES

EMERGENCY RESPONSE CHALLENGES

FUNDING: Access to the Main Disaster Funding from the Disaster Management Office was an issue – other internal funding were diverted to fund the disaster waste assessment activities.

DELAY IN RESPONSE: Disaster Waste Assessment Team comprising DEPC & Port Vila City Council undertook assessments at least three weeks after TC Harold came through Vanuatu.

DATA ANALYSIS: Delay in submission of assessment forms

LACK OF APPROPRIATE EQUIPMENTS/RESOURCES:

- Rapid Assessment was conducted on phone
- No People Protective Equipment, Woodchippers, Chain Saws, Minor Oil Spill Tool Kits
- No Temporary Dumpsite secured in Luganville

COLLABORATION BETWEEN RELEVANT STAKEHOLDERS: Needs to be strengthened

ASSESSMENT FORMS:

- Technical Issues – Revision of Forms without knowledge of assessment teams
- Technical Capacity/Guidance to undertake assessment and lack of baseline data to refer to

DATA ANALYSIS: Delay in submission of assessment forms

Post TC Harold Recovery Activity Challenge

The main challenges

- On the islands far from town, it is not easy to engage people to do cleanup and recovery activities as most people were busy rebuilding their homes and gardens
- Waste had to be transported from the smaller islands to the main island and it is not easy and costly to find boats

RECOVERY: Post Disaster Needs Assessment (PDNA)

Government Level : A PDNA Report has been submitted to the Prime Minister's Office it covers both Disaster Waste and Biodiversity recommendations post assessments.

Due to Dengue Fever Outbreak in Luganville, Santo a Massive Clean-Up Campaign was jointly organised by the Ministry of Health, the Luganville Municipal Council and the Department of Environmental Protection & Conservation – Fully funded by the DEPC.

Regional Level: A formal request for assistance sent to SPREP –ICA has donated disaster waste response equipment; chainsaws, safety boots, protective gear, goggles, Samsung tablets.

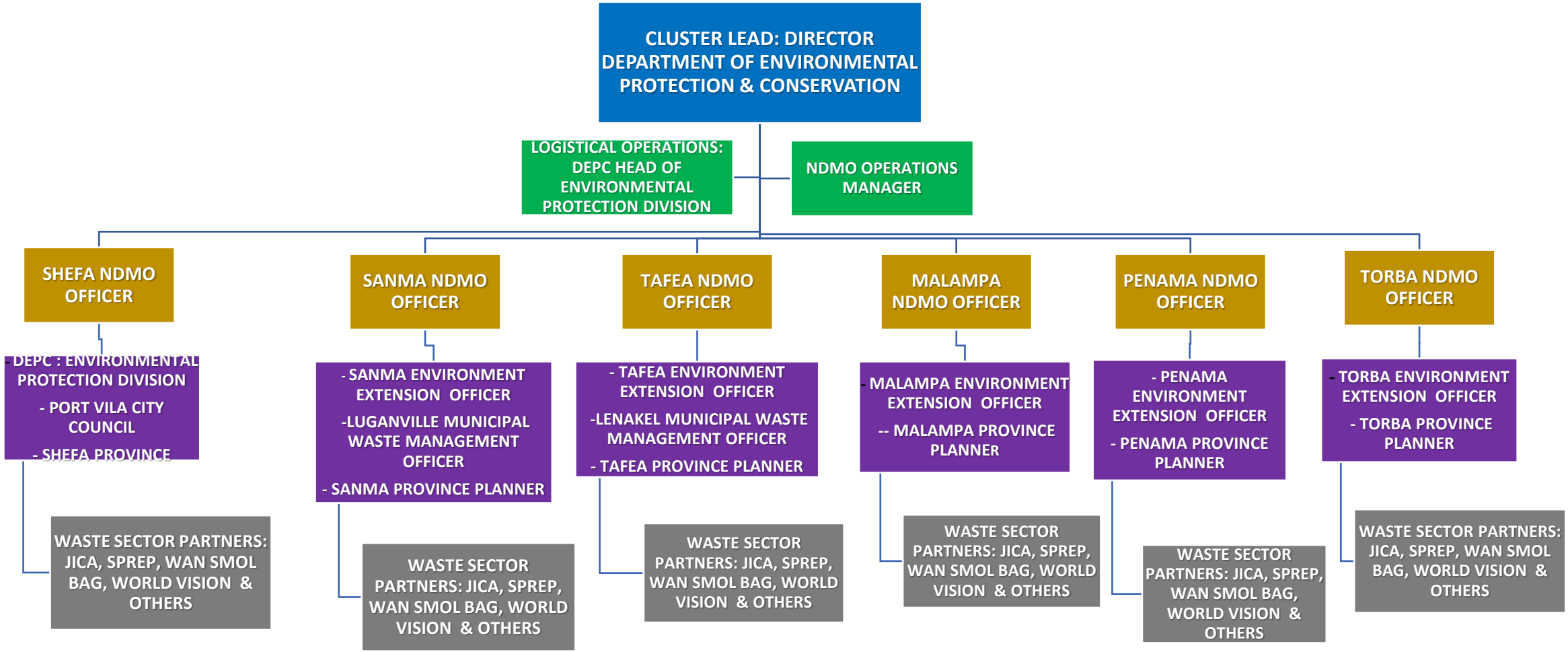
Expectations:

- Regional & International: Continuous dialogue with Regional & International Organisations including SPREP to Technical and financial support
- Coordination & Support by in-country representatives be in line with actual Country Needs post disaster

National Coordination: Disaster Waste Management

- Post-TC Harold , the Government through the Department of Environmental Protection & Conservation under the Ministry of Climate Change & Adaptation (MCCA) recognized the **need to establish a Disaster Waste Cluster under the National Disaster Framework**.
- In 2021, an Environment Cluster was established under the National Disaster Framework and has two sub-clusters; the **Disaster Waste sub-cluster** and the Biodiversity Loss sub-cluster.
- The **Disaster Waste Sub-cluster** has a structure that **links all key sectors including the Government, Sub-government and NGO's stakeholders.**

Environment Cluster: Disaster Waste Management Response Structure in Vanuatu



Thank you, Tankiu Tumas !

Ms. Roselyn Bue
Senior Ozone Officer
rbue@vqa.edu.vu

www.environment.gov.vu

Appendix 5e – National Action Plan – Tonga.

NEMO

Kingdom of Tonga

National Emergency Management Office (NEMO), Tonga

DISASTER MANAGEMENT STRUCTURES AND FUNCTIONS

Disaster Waste Management Workshop

December 2022

NEMO

Kingdom of Tonga

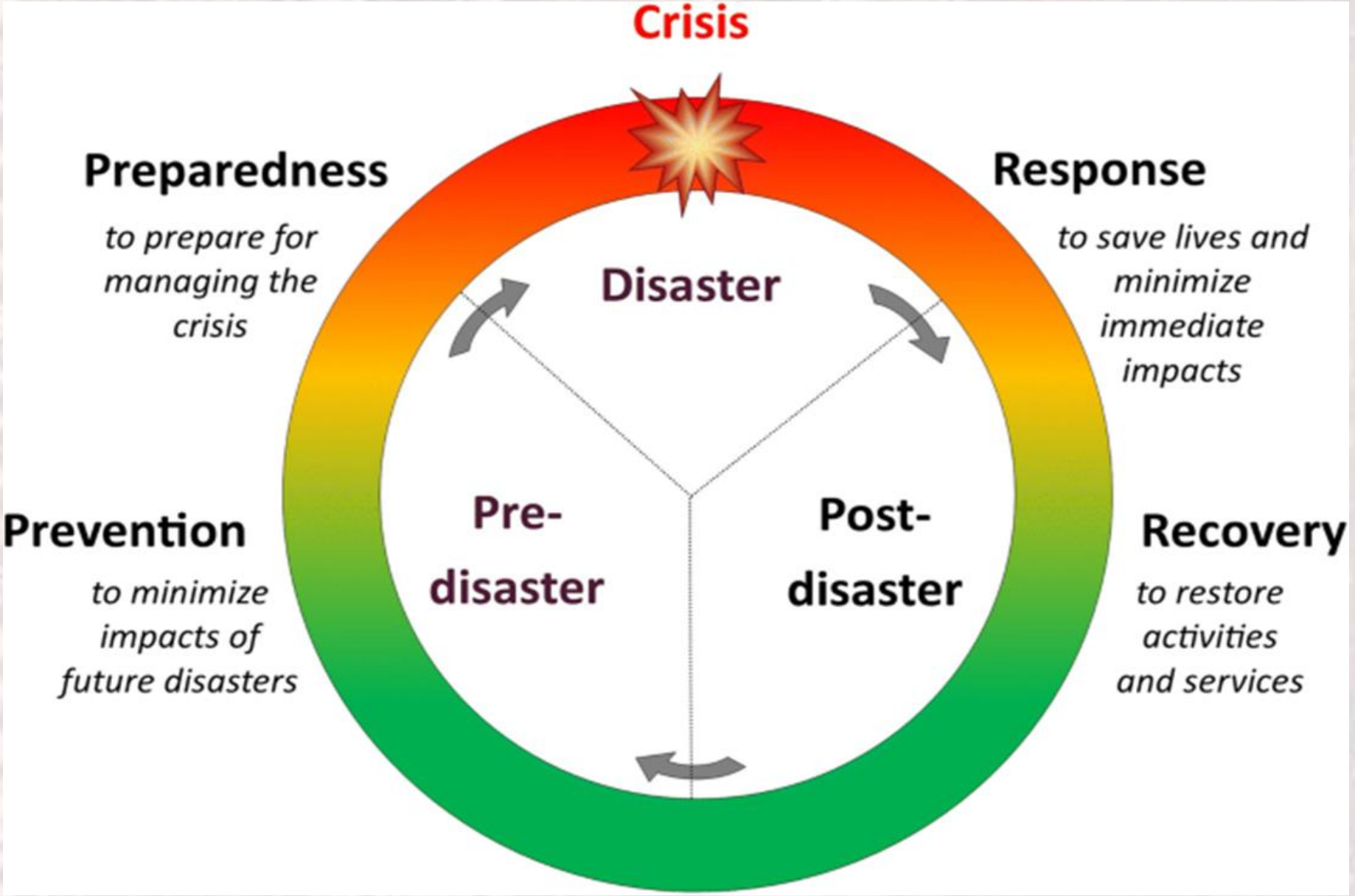
OUTLINE

- NEMO- scope and mandate
- National Disaster Management Structure & System-
- National Cluster system

NEMO

DISASTER MANAGEMENT CYCLE

Kingdom of Tonga



NEMO

Kingdom of Tonga

SCOPE & MANDATE

- Emergency Management Act 2007, *will soon replace by Disaster Risk Management Bill 2021 once Royal Assent*

- Disaster preparedness – planning, risk assessment, training, exercises at national, district and village levels, awareness program in schools and communities, tv and radio programs

- Disaster response (national & international partners including civil Military coordination) – disaster assessments, planning, communication, logistics, humanitarian relief

- Disaster Recovery & Reduction- Clusters' activities throughout the Disaster Management Cycle

Brief look at the new Disaster Risk Management Bill 2022

Kingdom of Tonga

- The Disaster Risk Management Bill 2021 (“the Bill”) contains 17 Parts. A summary of those Parts are outlined in the Explanatory Notes to the Bill.

- The purpose of the Bill is to establish a coherent legal, institutional and regulatory framework for –
  - (a) planning and management of disaster risk reduction and preparedness activities before a disaster occurs;
  - (b) coordinating emergency response during a disaster; and
  - (c) facilitating disaster recovery work after a disaster.

- A key change in the Bill is a change of emphasis, so that the Bill is focusing not just on emergency management, but on disaster risk management (DRM) generally.

- One of the key features is legalizing the Cluster system, including establishing functions and responsibilities of clusters

NEMO

Disaster Structure

Kingdom of Tonga

National Disaster Council
(NDC)
(CABINET)

Chair: Hon. Minister of MEIDECC

National Emergency Management Committee **(NEMC)**	*National Emergency Operations Committee* **(NEOC)**	*National Emergency Recovery Committee* **(NERC)**
Core Members: MOFA, MOF, MOF, MAFF, Police, HMAF, Tonga Fire, MLNR, MIA, MOI, MPE, MET, TRCS **CO-OPT MEMBERS**	**Core Members:** MOFA, MOF, MOF, MAFF, Police, HMAF, Tonga Fire, MLNR, MIA, MOI, MPE, MET, TRCS **CO-OPT MEMBERS**	**Core Members:** MOFA, MOF, MOF, MAFF, Police, HMAF, Tonga Fire, MLNR, MIA, MOI, MPE, MET, TRCS
Secretary: NEMO	Secretary: NEMO	Secretary: NEMO

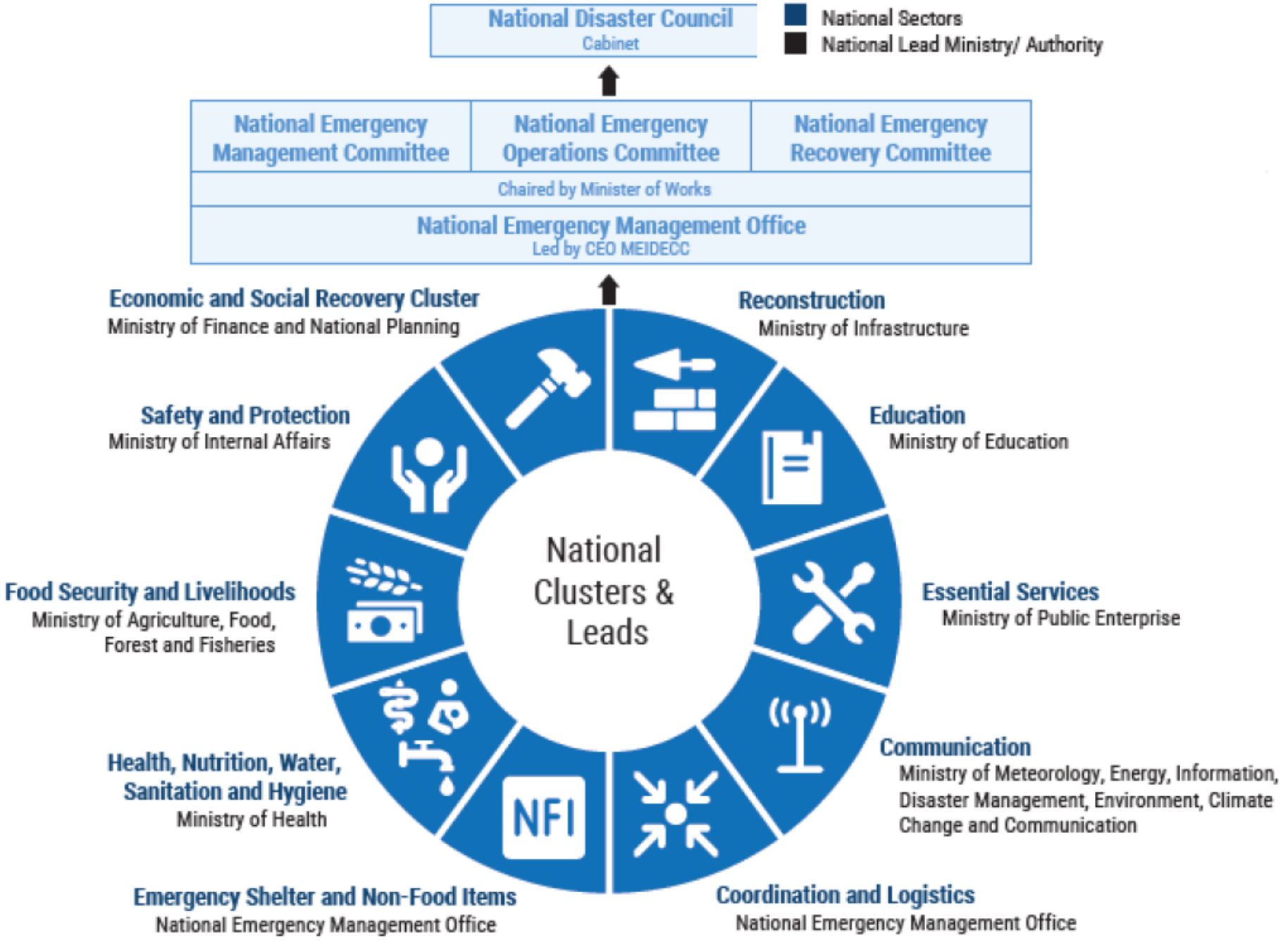
Chair: CEO for MEIDECC — *Clusters*

Chair: Governor/ Gov't Rep — *District Emergency Management Committee*

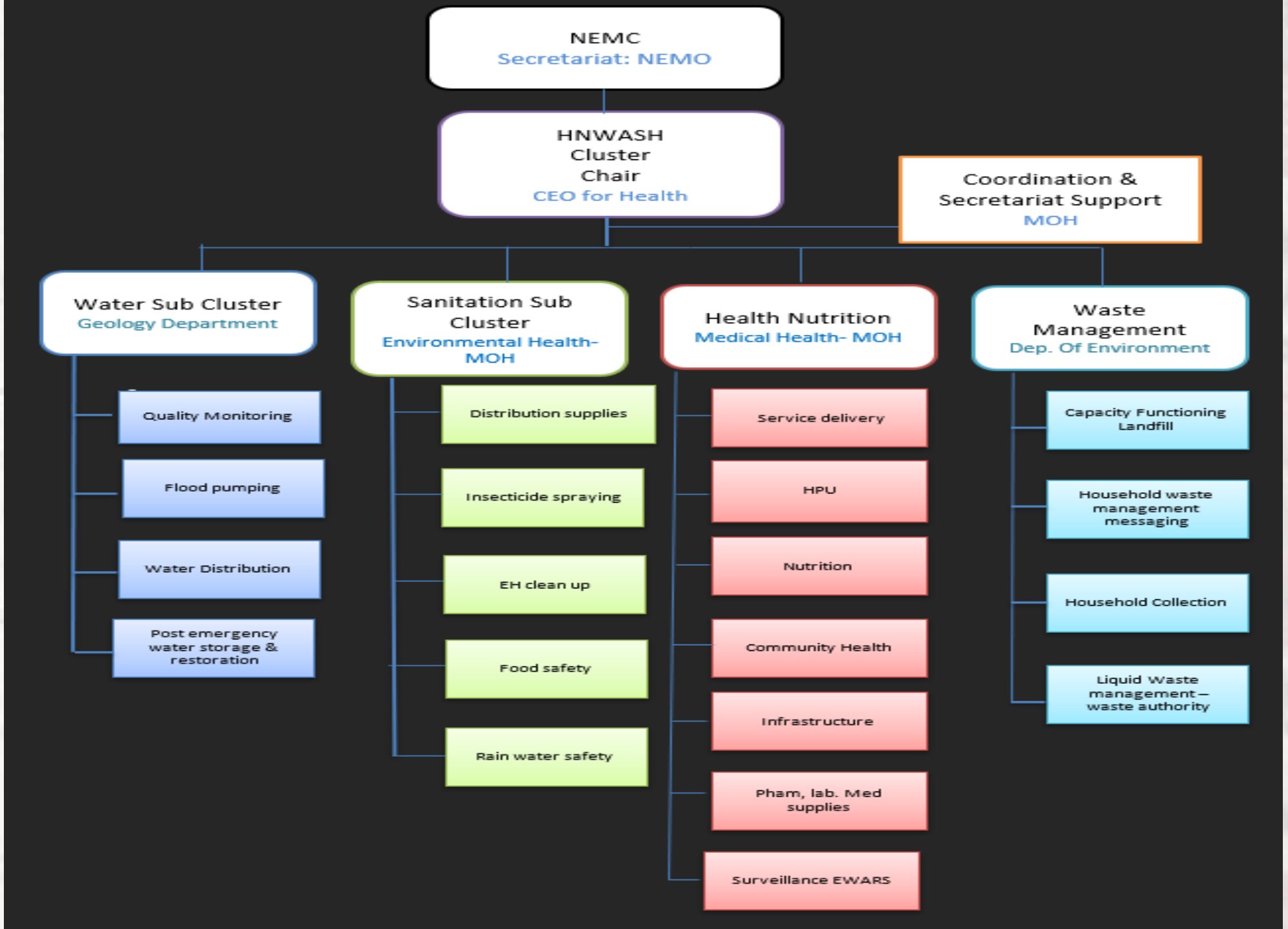
Chair: Town Officer — *Village Emergency Management Committee*

Policy and Preparedness	Delivery of Emergency Response	Coordination of Relief and Recovery

National Coordination Structure



Kingdom of Tonga



NEMO

Kingdom of Tonga

Preparedness

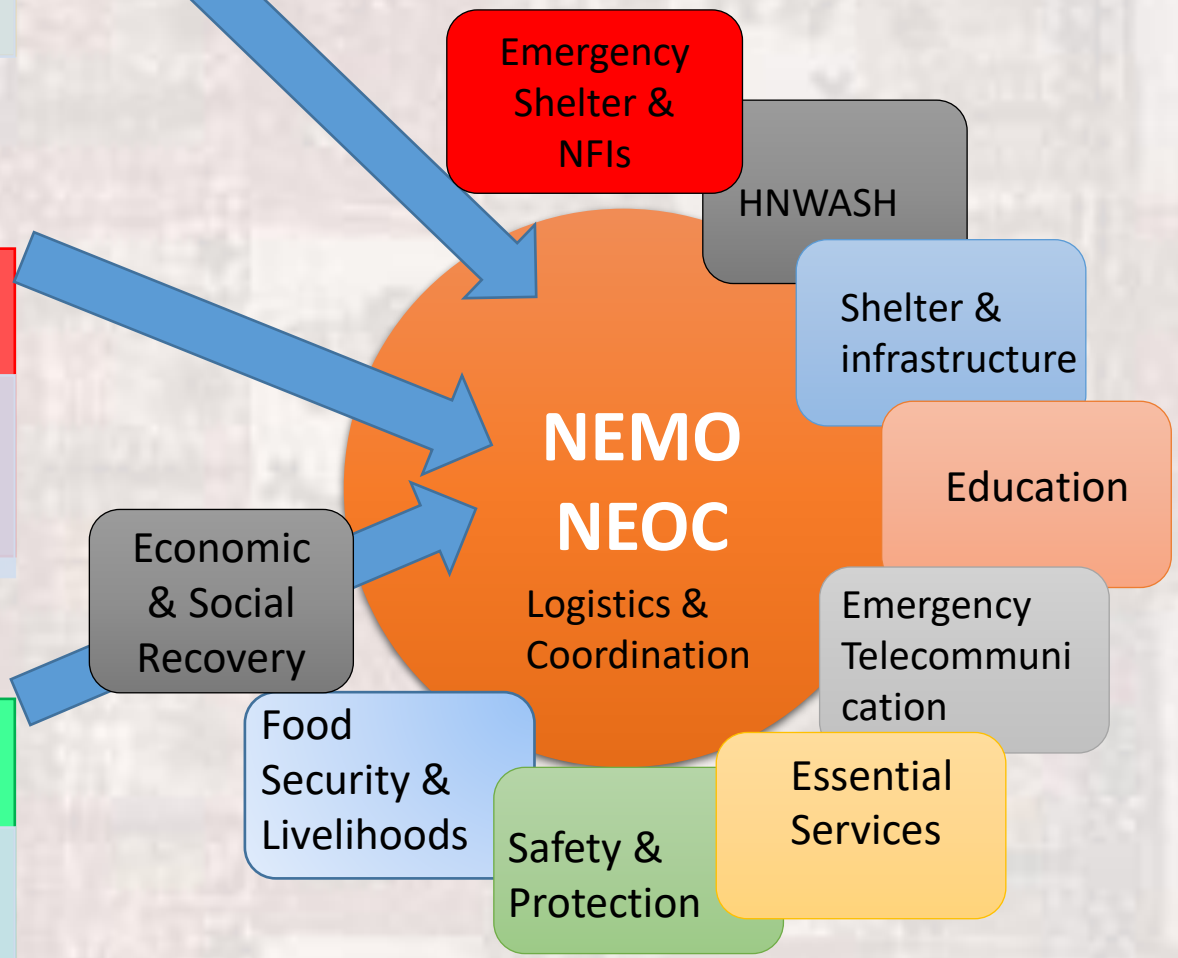
The arrangements and systems to ensure that communities are prepared should an emergency occur and that all those resources and systems which are needed to cope with the affects can be efficiently mobilised and deployed.

Response

The actions taken in anticipation of, during, and immediately after, an emergency or disaster to **ensure that all the impacts are minimised and that people affected are given immediate relief and support.**

Early Recovery

Coordinated processes for post-crisis recovery that are resilient and sustainable, encompassing the restoration of basic services, livelihoods, transitional shelter, security, environment and other socio-economic dimensions including reintegration of displaced populations.



NEMO

Kingdom of Tonga

Ministry of Meteorology, Energy, Information, **Disaster Management,** Environment, Climate Change & Communications (MEIDECC)

National Emergency Management Office (NEMO)

Ph #: 26340 / 28242

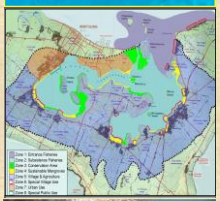
Tollfree #: 08006366

Website: www.nemotonga.gov.to

Appendix 5f – Lessons learned from Tonga on how they organised a Disaster Waste Management response/clean-up following the tsunami and volcano eruption.





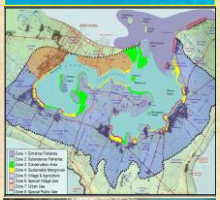



Hunga Tonga Hunga Ha'apai Volcanic Eruption and Tsunami Disasters National Clean Up Campaign

Mafile'o Masi
Department of Environment
MEIDECC

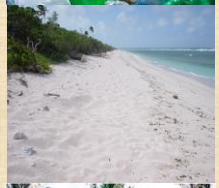


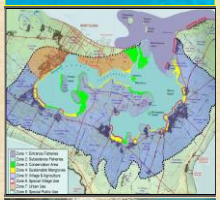





Outline of Presentation

- HTHH Volcanic Eruption/Tsunami Disasters
- Response and Recovery Efforts
- Challenges
- Opportunities

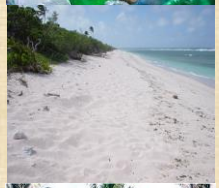

HTHH Volcanic Eruption/ Tsunami Disasters

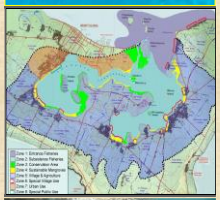
- On 15 January 2022, HTHH submarine volcano in the Tongan archipelago in the Southern Pacific Ocean erupted violently causing tsunamis in Tonga, Fiji, American Samoa, Vanuatu, along the Pacific rim including New Zealand, Japan, United States, the Russian Far East, Chile and Peru.
- At least two people were killed and some were injured, from waves up to 20m high.
- It was the largest volcanic eruption since the 1991 eruption of Mt Pinatubo, and the most powerful eruption since 1883 eruption of Karakatoa.

Source: Wikipedia

Cont.

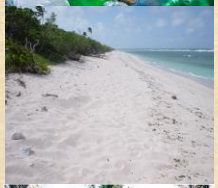
PC: www.gov.to

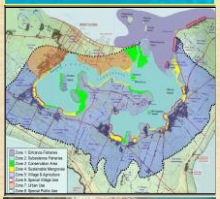




Cont.

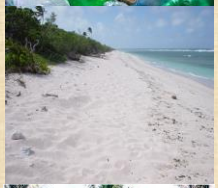

PC: Mango Community

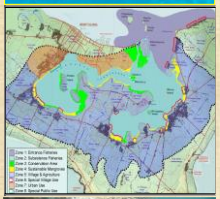




Response and Recovery Efforts

- ***HTHH volcanic eruption and tsunami disasters: Disaster Waste Response Plan endorsed by NEMC (National Emergency Management Committee)***
- ***Lead Agency-Department of Environment***
- ***Supporting Agencies-MOH, WAL, PMO, JICA, DFAT, HMAF, MOP, Tonga Red Cross Society, No Pelesitiki Campaign and Local Communities***

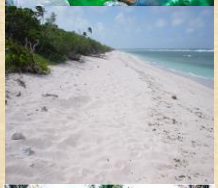



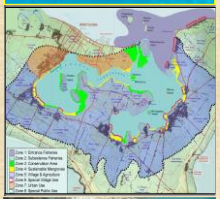




Cont.

1. Street Clean Up


PC: HMAF

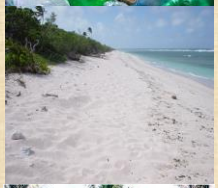



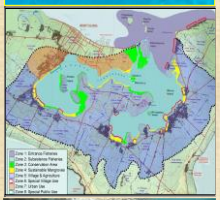




Cont.

2. Community Clean Up


PC: TRCS

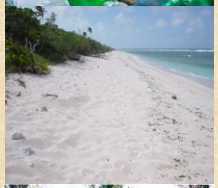



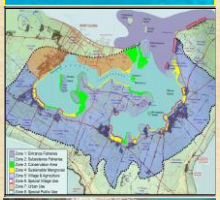

Cont.

3. Bulky waste Collection



PC: Tongatapu 4 Constituency

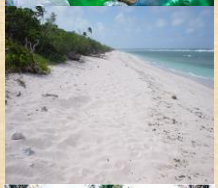



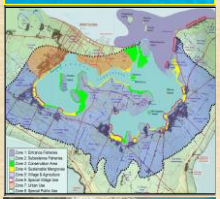




Cont.

4. Relief Supplies-Plastic containers

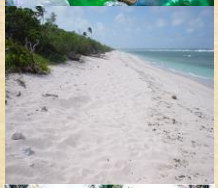

PC: No Pelesitiki Campaign

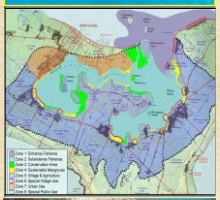




Challenges

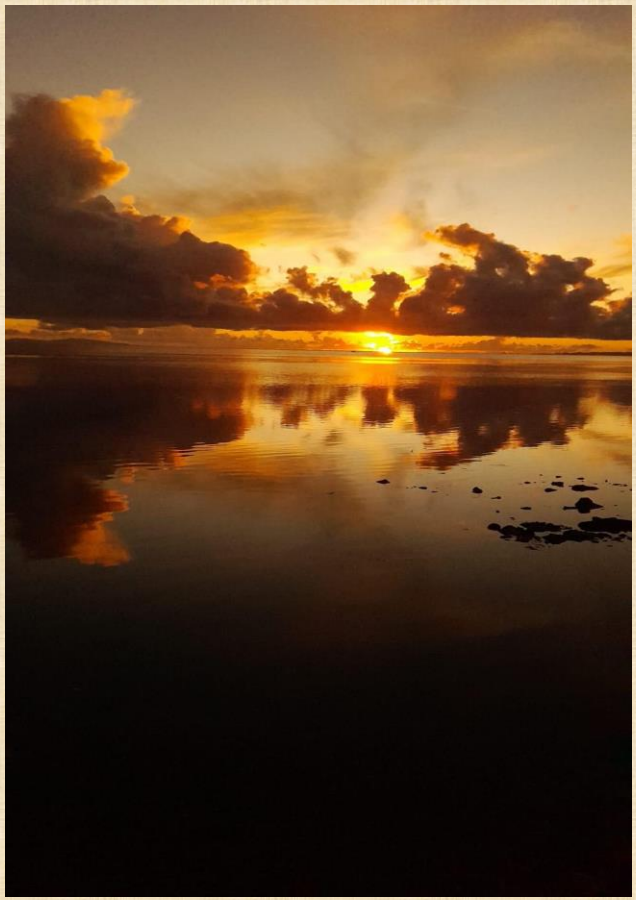
- Remote location
- Limited communications
- Lack of appropriate equipment
- Covid 19 outbreak
- Surplus of relief supplies
- Landfill reaching maximum capacity


For TONGA

"With God, Even the Darkest Night will end and the Sun will Rise Again"…



Malo 'Aupito

Appendix 5g – Lessons learned from Tonga on how the disaster waste was managed after the disaster for Asbestos.

EUROPEAN UNION

SPREP
Secretariat of the Pacific Regional Environment Programme

PacWastePlus
PACIFIC WASTE MANAGEMENT

This initiative is supported by **PacWastePlus**-a 72 month project funded by the European Union (**EU**) and implemented by the Secretariat of the Pacific Regional Environment Programme (**SPREP**) **to sustainably and cost effectively improve regional management of waste and pollution.**

Asbestos Waste Disposal in Tonga

Presented at the Virtual Workshop on Disaster Waste Management, 8 December 2022 by Tonga National Officer: Ms Sulieti Hufanga 'Ofa

Asbestos Waste

- The Department of Environment, from the Ministry of Meteorology, Energy, Information, Disaster Management, Environment, Climate Change and Communications (MEIDECC), seeks to build on the process started by PacWaste and invest PacWastePlus funds to improve long-term management of Asbestos Containing Materials (ACM) in Tonga.
- The previous natural disasters that severely impacted Tongatapu and the remote island groups have highlighted the health and environmental impacts of Disaster Waste and Asbestos Debris in Tonga.

Destroyed building at Kanokupolu Village

Damaged houses at Ha'atafu Village

ACM roof building- partially damaged

Asbestos Waste Disposal: Tapuhia Landfill

- Tapuhia Landfill is managed by Waste Authority Limited, which is a Public Enterprise. Tapuhia Landfill is an authorised site for solid waste management SWM disposal in Tongatapu. Collection services were extended to the outer islands of Vava'u in 2018, Ha'apai and 'Eua in 2020.
- Tapuhia Landfill covers an area of approximately six (6) hectares, dimension are 300 X 200 meters. The site is between 15 to 20 meters above sea level.

Tapuhia Entry Point


Waste Dumping Site

Asbestos Waste Disposal: Tapuhia Landfill

- According to the *Waste Management Act (2005)*, Waste Authority Limited is the authority for waste management collection services and disposal at the landfill in Tonga and in the outer islands.
- The landfill consists of four (4) cells. Cell one (1) is now full, and cell two (2) has now reached fifty percent (50%) of its capacity. Cell three (3) is planned to be constructed next year. CELL 4?

Google Earth Image of Tapuhia Landfill

Tapuhia Landfill – Tip face view area

Asbestos Removal & Disposal Process


Barracade ACM Site


Asbestos roof Removal


Asbestos Waste


Asbestos safely wrapped and sealed


ACM waste transport to Landfill


ACM disposal site at the Landfill

Asbestos In-Country Disposal Opportunity

Reduction of environmental and health exposure impacts

- Long-term storage requirements reduced/eliminated
- Risk of exposure through long-distance transport and handling reduced
- Cost savings can lead to more asbestos removal
- Efficient and **rapid** disposal option becomes available for asbestos disaster debris

Reduce climate impacts

- Off-island shipping eliminated
- Carbon footprint reduced

Reduce costs

- Significantly [4X] reduced disposal cost
- Dollars freed up for more asbestos removal work
- Costs for creating a landfill disposal cell for asbestos are low

“If the Kingdom of Tonga can do it, so can you.”

Country Priority Focus- ACM in Tonga

LEGISLATION

- To develop national legislation to ban the importation of asbestos or goods containing asbestos to ensure no more asbestos materials will arrive in Tonga

CODE OF PRACTISE

- Develop an asbestos Code of Practice to guide the management and handling of asbestos
- Establishment of Asbestos Inspectorate
- Identify the best practice for asbestos disposal at the landfill

Thank you for attention.

Happy to answer your questions?

For further information please contact:
Email: sulietih.ext@sprep.org / julie.hufanga@gmail.com or
lance@sprep.org

Please visit the PacWastePlus programme website to learn more

www.pacwasteplus.org

Appendix 5h – Disaster Waste Management Data Collection Project.

THE KOBOTOOLBOX APPLICATIONS

For Waste Management Purposes

Based on the Tonga Volcano-tsunami Post-disaster Data & Information Collection Pilot Project

1. What is Kobotoolbox?

- Kobotoolbox is **a suite of tools for field data collection for use in challenging environments**.

- **No more manual recording using papers** in the field, which takes time to analyze and extract key information for decision making.
- **Cheaper approach** for data collection

- **Data collection can be done offline** using smartphones and tablets.

- Questionnaires can be designed to collect all different types of data and formats - **numbers, texts, photos, GPS, audios, videos, scanned documents, etc.**

- Your survey can **reach your targeted audience and groups faster** by sending links to the questionnaires or forms using emails, messengers, etc.

- You **can design your questionnaire or form to make it easier** for the targeted audience to provide the needed information by just a click.

- It can also be used for **ongoing monitoring and data collection**. E.g. To monitor incoming waste to disposal sites, etc.

- Filled forms are submitted to the main server and the information can **be accessed, analyzed, and extracted or downloaded as soon as possible using any computer with internet** from anywhere in the world.

- Has two free servers for **humanitarian organizations & researchers, aid workers and everyone.**

Unlimited Use for Humanitarian Organizations

- Provided by UN-OCHA
- Unlimited Submissions
- Unlimited Data Storage
- Unlimited Projects

CREATE AN ACCOUNT

or login

Researchers, Aid Workers & Evervone Else

- Provided by Kobo Toolbox
- 10,000 Submissions per month.
- Unlimited Submissions
- 5 GB Data Storage per month
- Unlimited Projects

CREATE AN ACCOUNT

or login

- The **adaptation of the Kobotoolbox for humanitarian use** is a joint initiative between OCHA, Harvard Humanitarian Initiative (HHI)and the International Rescue Committee (IRC).

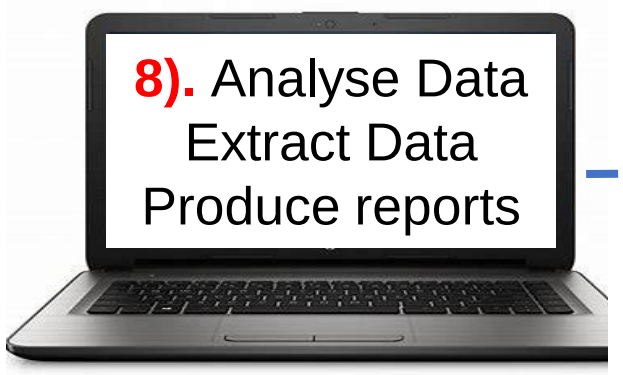
- As an **open-source software**, the developers are continually **making improvements based on the feedback from the users – regularly adding new features, etc.**

- **There is a Kobotoolbox Community Page for feedbacks, allowing the users to communicate with the developers on their experiences, issues and problems. These are used by the developers to make ongoing improvements.**

- Has **more advantages and benefits** than other similar data collection platforms like surveymonkey, microsoft forms, google forms, jotforms, etc:
  - Others cannot use smartphones and tablets to collect data.
  - Not free or have limited free provisions.
  - The questionnaires or data forms cannot collect all different types of data.
  - Etc.

2. How the Kobotoolbox Application works.

Computer



7). Filled forms enter the Kobo-server

Smart Phones & Tablets

1). Decide on a data collection project.

2). Develop forms or questionnaires depending on the needed data and project.

3). Activate the forms for use in the field

4). Download forms to smartphones & tablets

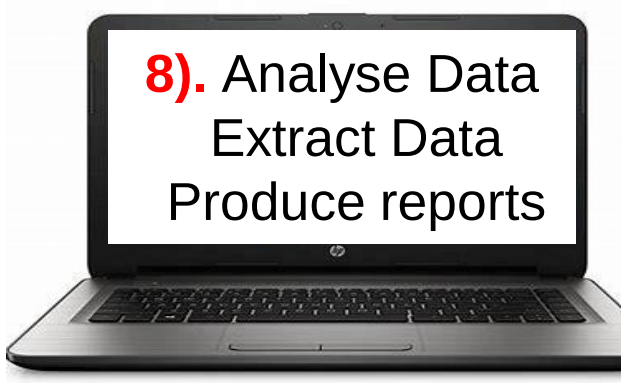
5). Fill the forms and submit or save for editing later (online or offline)

.

6). Send finalized forms.

At the Tonga Waste Authority Ltd (WAL) Headquarters - Tongatapu Island

Smart phones & tablets at all waste disposal sites



7). Filled forms transferred to the Kobo server

1). Decide to setup a **data collection project to collect data on the generated disaster waste from the volcano-tsunami disaster**

2). Develop forms to capture the daily incoming waste for disposal – **volume estimate, photos of trucks, type of waste**, **source**, etc.

3). Activate the forms for use by all sites in Tongatapu, Vava`u, Eua and Haapai

4). The forms are downloaded and received by recorders at the waste landfills in Tongatapu, Vavau, Eua and Haapai download forms – saved in their smartphones or tablets

5). Incoming waste to Tapuhia Landfill, Eua, Vava`u and Haapai disposal sites are recorded daily in the forms offline.

6). The **filled forms are sent automatically** once the phones or tablets connect to internet.

3. The Tonga Disaster Waste Data Collection & Monitoring Pilot Project (March - July 2022)

3.1. Background information.

On 15th January 2022, an underground volcano erupted.

Triggering a destructive tsunami which affected some parts of Tonga

Large quantities of disaster waste were generated from the direct impact to the natural and built environment


MALAU
MEDIA
PHOTOGRAPHY


MALAU
MEDIA
PHOTOGRAPHY


MALAU
MEDIA
PHOTOGRAPHY


MALAU
MEDIA
PHOTOGRAPHY


MALAU
MEDIA
PHOTOGRAPHY


MALAU
MEDIA
PHOTOGRAPHY


MALAU
MEDIA
PHOTOGRAPHY


MALAU
MEDIA
PHOTOGRAPHY


MALAU
MEDIA
PHOTOGRAPHY


MALAU
MEDIA
PHOTOGRAPHY
'ALO'OFA


MALAU
MEDIA
PHOTOGRAPHY
BROKER


MALAU
MEDIA
PHOTOGRAPHY

As part of Disaster Response & Recover Support of JPRISM 2 to PICs during disaster events

- Equipment and tools were provided to Tonga.
- Support maintenance operations of the waste disposal sites.
- Established an Information System to gather information and data on the generated disaster waste.

Purpose:

- Piloting the collection of disaster waste data and information in Tonga using the Kobotoolbox app as one of the available mobile data collection platforms.

Key Objectives:

- Establishing an information system to support the quick collection of data and information on disaster waste during disaster and emergency events in Tonga.
- Improved data collection, monitoring and management on collected, disposed and recovered waste for recycling purposes in the long term.
- Use of the established system for other general waste management information assessment and monitoring purposes.

Methodologies

- Daily recording of the incoming waste to the disposal sites to estimate the amount of DW by WAL.

- Key Data and Information
  - daily incoming vehicles details.
  - volume estimate of the incoming waste based on the incoming vehicle.
  - type of Waste
  - photos (to confirm the actual collected waste amount and type.

- Use of a Mobile Data Platform to quickly gather the data.
  i.e. Kobotoolbox

Established WAL Waste Information System: Kobo-hosted

Tapuhia Waste Landfill - Tongatapu Island

Form

Data

Eua Waste Disposal Site

Form

Data

KOBO SERVER – At WAL Headquarters in Tongatapu

Form

Data

Waste Disposal Site – Ha`apai Island

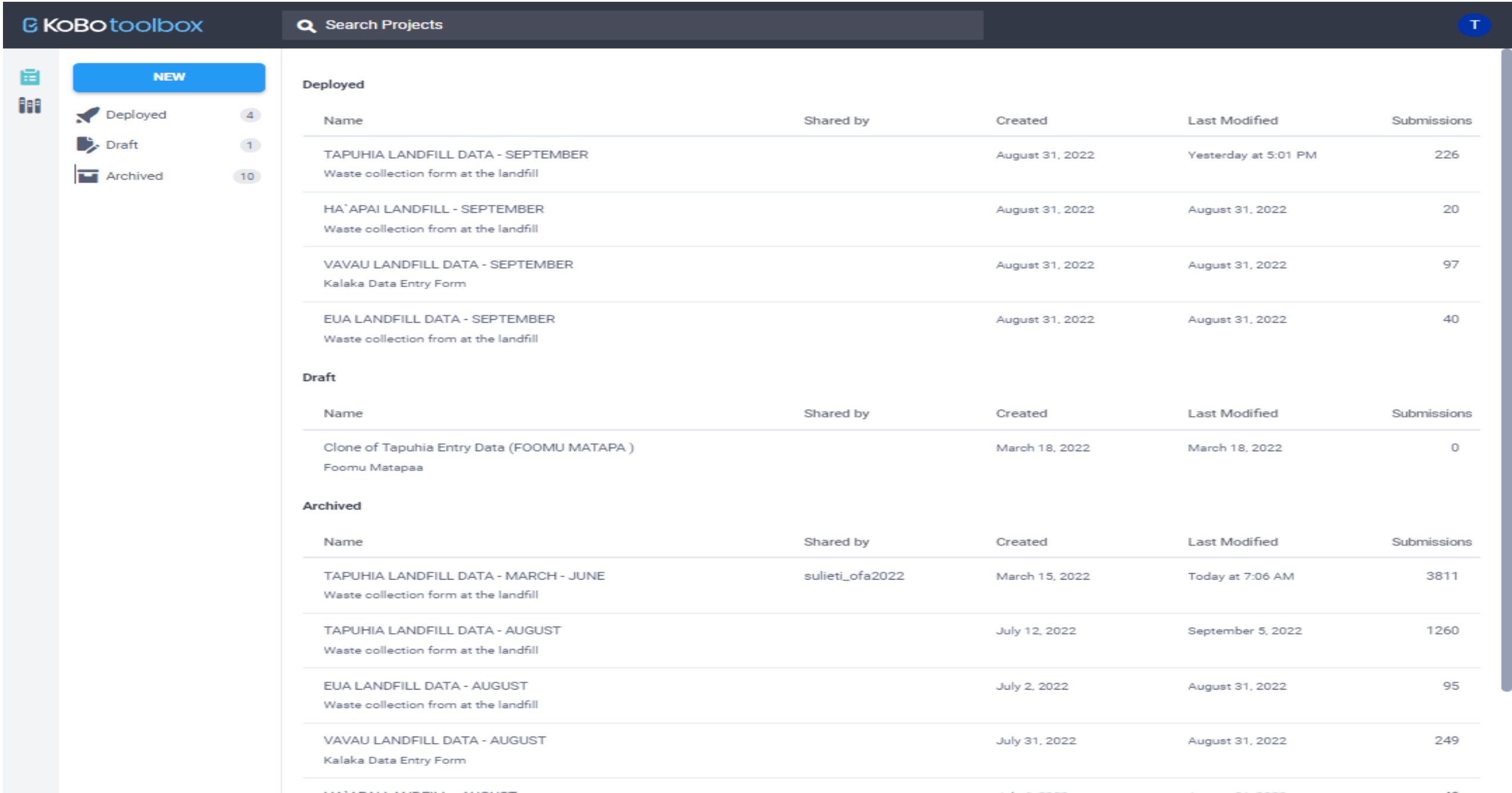
Form

Data

Waste Landfill, Vava`u Waste Landfill

Sharing forms or questionnaires for filling
Data Transfer to the main server at WAL

THE MAIN SERVER –SCREEN OF TONGA DW DATABASE



Sending and sharing forms or questionnaires

- Can send a link through an email message or messenger.
- Download using the KoboCollect app available on android devices (smartphones and tablets).

Extracting Data from the Database

- Can convert to Excel format for additional analysis.
- Can download the automatically generated summary reports

Example of Excel format downloaded data

Date	Waste Origin	Incoming Trucks	Vehicle Type	Customer	Truck Registration	Volume of Wast	Volume	Photo	Type of Waste	Reference Form
2022-07-01		WAL Services (Loli Veve WAL)	WAL Compactor Truck (Loli komipekitaa WAL)			1				1
2022-06-24	Kolomotu'a	WAL Services (Loli Veve WAL)	WAL Septic Truck (Loli pamu Sepitiki WAL)		J8650		4/4	https://kc.kobotoolbox.org/media/	Septic Waste (Veve Sepitiki)	2
2022-06-24	Fanga / Havelu	Others (Ikai koe Loli Veve ae WAL)		Vaitohi	L26911	3		https://kc.kobotoolbox.org/media/	Mix Waste (Veve Mix)	3
2022-06-24	Kolo	Others (Ikai koe Loli Veve ae WAL)		Lisiate Rass	J9732	4		https://kc.kobotoolbox.org/media/	Mix Waste (Veve Mix)	4
2022-06-24	Tofoa	WAL Services (Loli Veve WAL)	WAL Compactor Truck (Loli komipekitaa WAL)		J10294	3		https://kc.kobotoolbox.org/media/	Mix Waste (Veve Mix)	5
2022-06-24	Tofoa	WAL Services (Loli Veve WAL)	WAL Compactor Truck (Loli komipekitaa WAL)		J9420	2		https://kc.kobotoolbox.org/media/	Mix Waste (Veve Mix)	6
2022-06-24	Tofoa	WAL Services (Loli Veve WAL)	WAL Non Compactor Truck (Loli veve 1- 3 toni)		J9434	3		https://kc.kobotoolbox.org/media/	Mix Waste (Veve Mix)	7
2022-06-24	Kolo	Others (Ikai koe Loli Veve ae WAL)		Ana Gift	J9910	3		https://kc.kobotoolbox.org/media/	Mix Waste (Veve Mix)	8
2022-06-24	Lavengatonga / Tofoa	WAL Services (Loli Veve WAL)	WAL Compactor Truck (Loli komipekitaa WAL)		J9420	2		https://kc.kobotoolbox.org/media/	Mix Waste (Veve Mix)	9
2022-06-24	Tofoa	WAL Services (Loli Veve WAL)	WAL Compactor Truck (Loli komipekitaa WAL)		J10294	3		https://kc.kobotoolbox.org/media/	Mix Waste (Veve Mix)	10
2022-06-24	Kolo	Others (Ikai koe Loli Veve ae WAL)		Waste Management	J5383	2		https://kc.kobotoolbox.org/media/	Mix Waste (Veve Mix)	11
2022-07-01	Tofoa	WAL Services (Loli Veve WAL)	WAL Compactor Truck (Loli komipekitaa WAL)		J10294	3		https://kc.kobotoolbox.org/media/	Mix Waste (Veve Mix)	12
2022-07-01	Tofoa	WAL Services (Loli Veve WAL)	WAL Non Compactor Truck (Loli veve 1- 3 toni)		J9434	3		https://kc.kobotoolbox.org/media/	Mix Waste (Veve Mix)	13
2022-07-01	Kolo	Others (Ikai koe Loli Veve ae WAL)		Rich Rass	J9732	5		https://kc.kobotoolbox.org/media/	Mix Waste (Veve Mix)	14
2022-07-01	Tofoa	WAL Services (Loli Veve WAL)	WAL Compactor Truck (Loli komipekitaa WAL)		J10294	3		https://kc.kobotoolbox.org/media/	Mix Waste (Veve Mix)	15
2022-07-01	Tofoa	WAL Services (Loli Veve WAL)	WAL Compactor Truck (Loli komipekitaa WAL)		J10295	4		https://kc.kobotoolbox.org/media/	Mix Waste (Veve Mix)	16
2022-07-01	Kolovai mo Houma	WAL Services (Loli Veve WAL)	WAL Non Compacetor Truck (Loli veve 4- 6 toni)		J9474	4		https://kc.kobotoolbox.org/media/	Mix Waste (Veve Mix)	17
2022-07-01	Havelu	Others (Ikai koe Loli Veve ae WAL)		Vaitohi	L26911	4		https://kc.kobotoolbox.org/media/	Mix Waste (Veve Mix)	18
2022-07-01	Matahau	WAL Services (Loli Veve WAL)	WAL Non Compactor Truck (Loli veve 1- 3 toni)		J9434	3		https://kc.kobotoolbox.org/media/	Mix Waste (Veve Mix)	19
2022-07-01	MAtahau mo Houma	WAL Services (Loli Veve WAL)	WAL Compactor Truck (Loli komipekitaa WAL)		J10294	3		https://kc.kobotoolbox.org/media/	Mix Waste (Veve Mix)	20
2022-07-01	HOuma	WAL Services (Loli Veve WAL)	WAL Non Compacetor Truck (Loli veve 4- 6 toni)		J9864	5		https://kc.kobotoolbox.org/media/	Mix Waste (Veve Mix)	21
2022-07-01	Ha'atafu mo Houma	WAL Services (Loli Veve WAL)	WAL Non Compacetor Truck (Loli veve 4- 6 toni)		J9978	4		https://kc.kobotoolbox.org/media/	Mix Waste (Veve Mix)	22
2022-07-01	Kolo	Others (Ikai koe Loli Veve ae WAL)		Waste Management	J5383	2		https://kc.kobotoolbox.org/media/	Mix Waste (Veve Mix)	23
2022-07-01	Tano'a	WAL Services (Loli Veve WAL)	WAL Septic Truck (Loli pamu Sepitiki WAL)		J8650		3/4	https://kc.kobotoolbox.org/media/	Septic Waste (Veve Sepitiki)	24
2022-07-01	Ha'asini	WAL Services (Loli Veve WAL)	WAL Compactor Truck (Loli komipekitaa WAL)		J10295	4		https://kc.kobotoolbox.org/media/	Mix Waste (Veve Mix)	25
2022-07-01	Kolo	Others (Ikai koe Loli Veve ae WAL)		Rich Rass	J9732	4		https://kc.kobotoolbox.org/media/	Mix Waste (Veve Mix)	26
2022-07-01	Ha'asini mo Nakolo	WAL Services (Loli Veve WAL)	WAL Non Compacetor Truck (Loli veve 4- 6 toni)		J9474	4		https://kc.kobotoolbox.org/media/	Mix Waste (Veve Mix)	27
2022-07-01	TANO'A	WAL Services (Loli Veve WAL)	WAL Septic Truck (Loli pamu Sepitiki WAL)		J8650		3/4	https://kc.kobotoolbox.org/media/	Septic Waste (Veve Sepitiki)	28
2022-07-01	Veitongo	Others (Ikai koe Loli Veve ae WAL)		Household		2			Asbestos (Esipesitosi)	29

TAPUHIA LANDFILL DATA - JULY

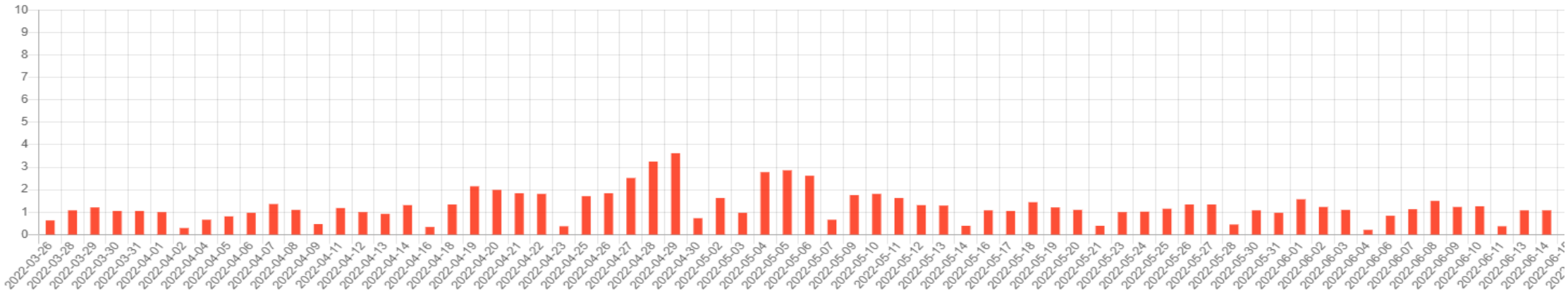
Example of Downloaded Automatically Generated Reports

TAPUHIA MONTHLY REPORT ▾

This is an automated report based on raw data submitted to this project. Please conduct proper data cleaning prior to using the graphs and figures used on this page.

Date

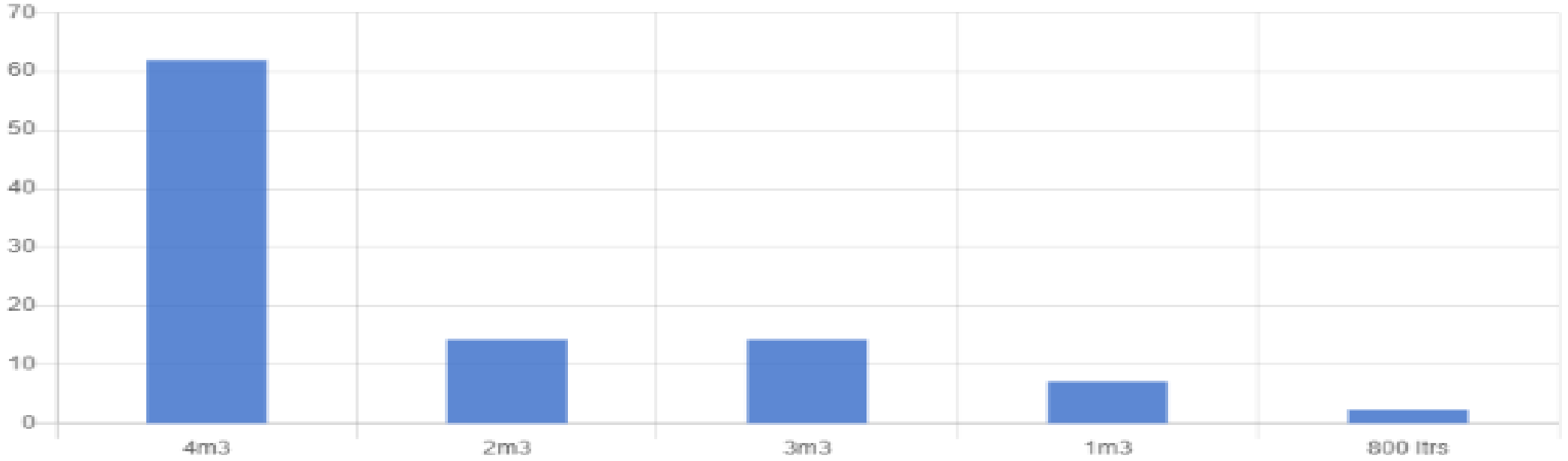
TYPE: "DATE". 3808 out of 3810 respondents answered this question. (2 were without data.)



Value	Frequency
2022-03-26	24
2022-03-28	41
2022-03-29	46
2022-03-30	40
2022-03-31	40

Volume of Waste

TYPE: "SELECT_ONE". 42 out of 42 respondents answered this question. (0 were without data.)

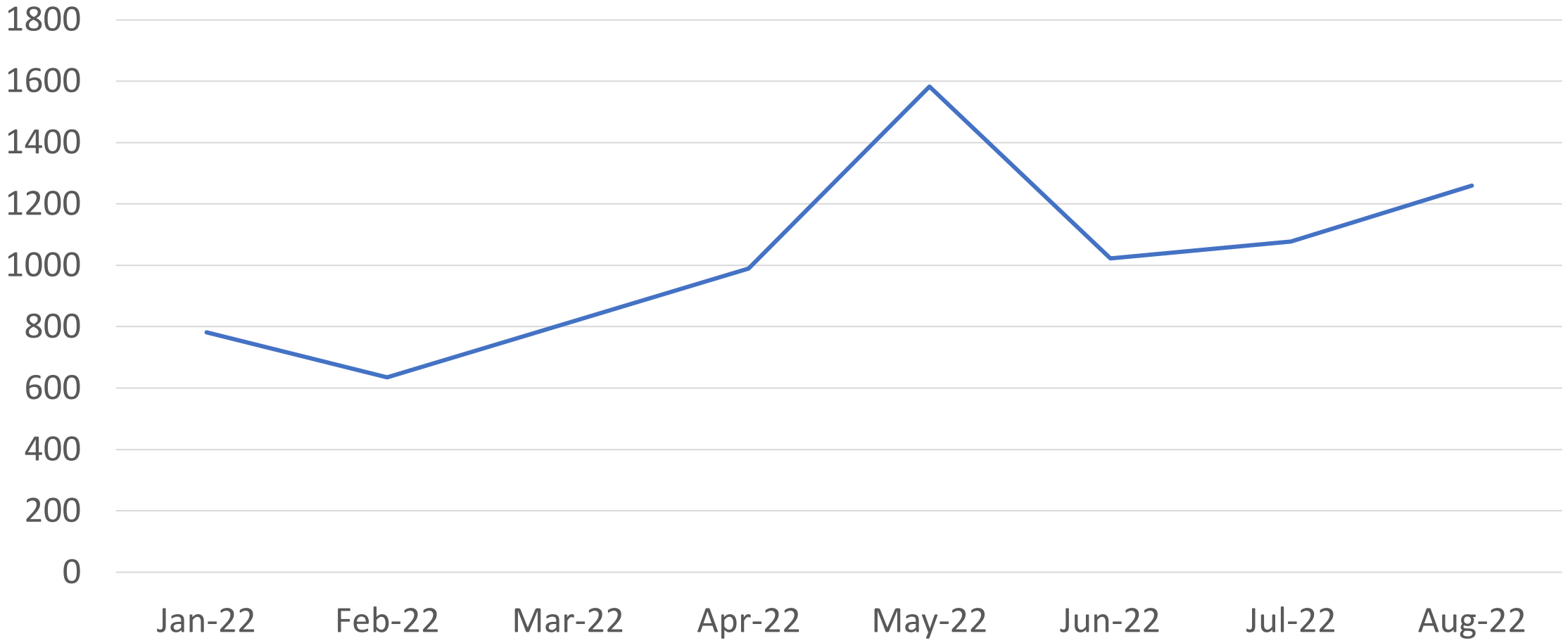


Value	Frequency	Percentage
4m3	26	61.9
2m3	6	14.29
3m3	6	14.29
1m3	3	7.14
800 ltrs	1	2.38

Preliminary Collected Data – Tapuhia Waste Landfill

Month	No. Incoming Truckloads
Jan-22	781 (manually)
Feb-22	635 (manually)
Apr-22	990 electronically
May-22	1582 electronically
Jun-22	10I2 electronically
Jul-22	1078 electronically
Aug-22	1260 electronically
TOTAL	**7348**

No. Incoming Truckloads between Jan-August 2022 – Tapuhia Landfill



Composition of Incoming Waste: March – June 2022

Value	Frequency	Percentage
Mix Waste (Veve Mix)	2474	64.93
Green Waste (Veve la'i'akau, musie etc)	1152	30.24
Bulky Waste Collection (Hiko Veve Lalahi) - Government	636	16.69
Septic Waste (Veve Sepitiki)	620	16.27
Building Materials (Veve langa fale)	77	2.02
Electrical Goods (Naunau fakaelekitulonika, kompiuta, Misini foo etc)	57	1.5
Expires / Rejected Goods (Koloa maumau/expaea)	15	0.39
GPO Project (Tokoni 'a e Pule'anga ki he kakai)	9	0.24
Plastic & Glass Waste (Hiko Veve Pelesitiki & Hina Sio'ata)	9	0.24
Asbestos (Esipesitosi)	3	0.08
Dead Animals (Monumanu Mate)	1	0.03

Composition of the Incoming Waste by Source

Value	Frequency	Percentage
Household (Api Nofo'anga)	2701	70.89
Business (Pisinisi)	2226	58.43
Government Agencies (Ofisi Fakapule'anga)	31	0.81
Private Sector (Kautaha Taau taha)	6	0.16
Disaster Relief Supplies (Veve maumau 'ae Kasitomu/NEMO)	4	0.1

Record of incoming vehicles on a daily basis

Value	Frequency	Percentage
2022-03-26	24	0.63
2022-03-28	41	1.08
2022-03-29	46	1.21
2022-03-30	40	1.05
2022-03-31	40	1.05
2022-04-01	38	1
2022-04-02	11	0.29
2022-04-04	25	0.66
2022-04-05	31	0.81
2022-04-06	37	0.97
2022-04-07	52	1.36
2022-04-08	42	1.1

Vehicles arriving at specific time

Value	Frequency	Percentage
11:20:00.000+13:00	29	0.76
12:20:00.000+13:00	28	0.73
10:40:00.000+13:00	25	0.66
09:25:00.000+13:00	25	0.66
12:05:00.000+13:00	24	0.63
12:00:00.000+13:00	23	0.6
12:30:00.000+13:00	23	0.6
09:00:00.000+13:00	23	0.6
11:40:00.000+13:00	23	0.6
10:50:00.000+13:00	23	0.6
11:10:00.000+13:00	22	0.58
08:15:00.000+13:00	21	0.55
12:25:00.000+13:00	21	0.55

Locations of the Collected Waste

Value	Frequency	Percentage
Kolo	396	10.39
Folaha	217	5.7
Tofoa	205	5.38
Tongatapu 3	131	3.44
Tt6	124	3.25
Tt2	114	2.99
Vaini	106	2.78
Maufanga	82	2.15
Tt4	78	2.05
Tt3	59	1.55
Havelu	57	1.5
Fasi	57	1.5

Proportion of the Waste Authority Trucks / Other Contractors

Value	Frequency	Percentage
Others (Ikai koe Loli Veve ae WAL)	2033	53.36
WAL Services (Loli Veve WAL)	1775	46.59

Waste Authority Trucks Drivers

Value	Frequency	Percentage
Metui	221	5.8
Toni	207	5.43
Ray	195	5.12
Saia	158	4.15
Afei	147	3.86
Epeli	136	3.57
Kolo	105	2.76
Aleki	72	1.89
'Epeli	71	1.86
Angaikolo	50	1.31
'Aleki	45	1.18
Misi	35	0.92
Mone	31	0.81
METUI	31	0.81

Other Incoming Vehicles' Drivers

Value	Frequency	Percentage
Kapi	132	3.46
Soa	114	2.99
Vaha	110	2.89
Akilisi	103	2.7
Sione	95	2.49
Viliami	85	2.23
'Akilisi	65	1.71
Sake	62	1.63
Paea	44	1.15
Vau	41	1.08
Saia	31	0.81
Mana	30	0.79

Record of Incoming Trucks / Vehicles by Type

Value	Frequency	Percentage
WAL Compactor Truck (Loli komipekitaa WAL)	726	19.06
WAL Non Compactor Truck (Loli veve 1- 3 toni)	606	15.91
WAL Septic Truck (Loli pamu Sepitiki WAL)	256	6.72
WAL Non Compacetor Truck (Loli veve 4- 6 toni)	174	4.57
Vaitohi Compactor Truck (Loli komipekitaa veve Vaitohi - 3 toni)	4	0.1
WAL Double Cap / Mini Van (Tapolokepi, veeni siisii)	4	0.1

Incoming Waste Generating Sources

Value	Frequency	Percentage
Waste Management	157	4.12
Household	87	2.28
Vaitohi	71	1.86
MEIDECC	27	0.71
Ministry of Health	11	0.29
Lisiate Raas	10	0.26
BIN-GO	9	0.24
Richard Rass	7	0.18
Rich Rass	7	0.18
Bin - Go	7	0.18
Tonga Airport Limited	6	0.16

Incoming vehicles by type / client

Value	Frequency	Percentage
Dump / Non dump truck (1-2m3) - Mealele/Loli hua'i veve (1-2m3)	939	24.65
Waste Management Septic Truck (Loli pamu sepitiki Waste Management)	331	8.69
Vaitohi Compactor Truck (Loli komipekitaa veve Vaitohi - 3 toni)	191	5.01
Waste Management Non Compactor Truck (Loli veve WM - 2 toni)	104	2.73
Rich Rass Compactor Truck (loli komipekita veve RR- 5 toni)	98	2.57
Dump / Non dump truck (4-6m3) - Mealele /Loli hua'i veve (4-6m3)	97	2.55
Bin Go Non Compactor Heavy Truck (Loli Veve Bin Go - 10 toni)	40	1.05
Dump / Non dump truck (8m3+) - Mealele/Loli hua'i veve (8m3+)	34	0.89
Small vehicle (pickup, van, etc.) - Veeni uta si'isi'i/Uti hua'i veve	32	0.84
MOH Septic Truck (Loli pamu Sepitiki Falemahaki)	27	0.71
Ports Authority Non Compactor truck (Loli Veve Poate Taulanga - 4 toni)	26	0.68
MOH Non Compactor Truck (Loli Veve MOH)	20	0.52
Vaitohi Non Compactor Truck (Loli veve Vaitohi - 2 toni)	12	0.31
Dump / Non dump truck (1-2m3) - Mealele/Loli hua'i veve (1-2m3)	8	0.21

Frequency by specific trucks and vehicles

J9420	232	6.09
L26911	195	5.12
J10295	190	4.99
J9978	178	4.67
J9434	172	4.51
J9864	167	4.38
J8320	164	4.3
J9474	159	4.17
J9224	152	3.99
J5383	114	2.99
J9732	90	2.36
J9303	54	1.42
J7767	51	1.34
J8306	42	1.1
P2192	38	1

Disposal Fee Estimate

Value	Frequency	Percentage
BW 2m3 - $40.00	33	3.06
MW 1m3 - $15.00	27	2.5
MW 2m3 - $20.00	27	2.5
MW 4m3 - $30.00	6	0.56
MW 3m3 - $25.00	4	0.37
BW 3m3 - $50.00	2	0.19
BW 4m3 - $60.00	1	0.09
MW 5m3 - $35.00	1	0.09

Additional Input from the Project Team

- Experiences and lessons learnt from using the system.
- Questions and Answers
- Demonstration and tour of the established database.

Appendix 5i – Practitioner Guidelines.

EUROPEAN UNION

SPREP
Secretariat of the Pacific Regional Environment Programme

PacWastePlus
PACIFIC WASTE MANAGEMENT

This initiative is supported by **PacWastePlus**-a 72 month project funded by the European Union (**EU**) and implemented by the Secretariat of the Pacific Regional Environment Programme (**SPREP**) **to sustainably and cost effectively improve regional management of waste and pollution.**

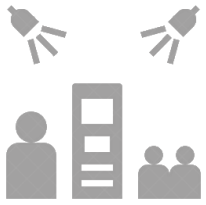
Disaster Waste Management for a Resilient Pacific

Virtual Workshop on Disaster Waste Management: Knowledge sharing from the Pacific Islands

8 December 2022

Objectives of this presentation:

Enhance knowledge of the concept of Disaster Waste Management and how effective waste management contributes to improving capacity of Pacific Countries to prepare for emergencies and disasters, thereby ensuring timely and effective response



Showcase initiatives by some Pacific Island Countries in mainstreaming Disaster Waste Management into national disaster management and risk reduction efforts

Inform on:

- **Regional Disaster Waste Taskforce -** established following the Clean Pacific Roundtable discussion and Guideline on Establishing Environment Sector Working Group
- **Practitioner guidelines** that will assist Pacific Islands countries to mainstream Disaster Waste Management into National Disaster Management framework.
- Guideline in drafting **National and Community Disaster Waste Management Plans**
- Guideline on **Standard Methodology for Estimating Disaster Waste.**

PacWastePlus Regional Project Disaster Waste Management

Ms Sainimili Bulai

PacWastePlus Project Technical Waste Officer

Secretariat of the Pacific Regional Environment Project

Introduction and Background: PacWastePlus

This initiative is supported by **PacWastePlus**-a 72-month project funded by the European Union (**EU**) and implemented by the Secretariat of the Pacific Regional Environment Programme (**SPREP**) **to sustainably and cost effectively improve regional management of**

The overall Programme objective: to generate improved economic, social, health and environmental benefits for PACP states arising from stronger regional economic integration and the sustainable management of natural resources and the environment.

The specific objective: to ensure the safe and sustainable management of waste with due regard for the conservation of biodiversity, health and wellbeing of Pacific island communities and climate change mitigation and adaptation requirements.

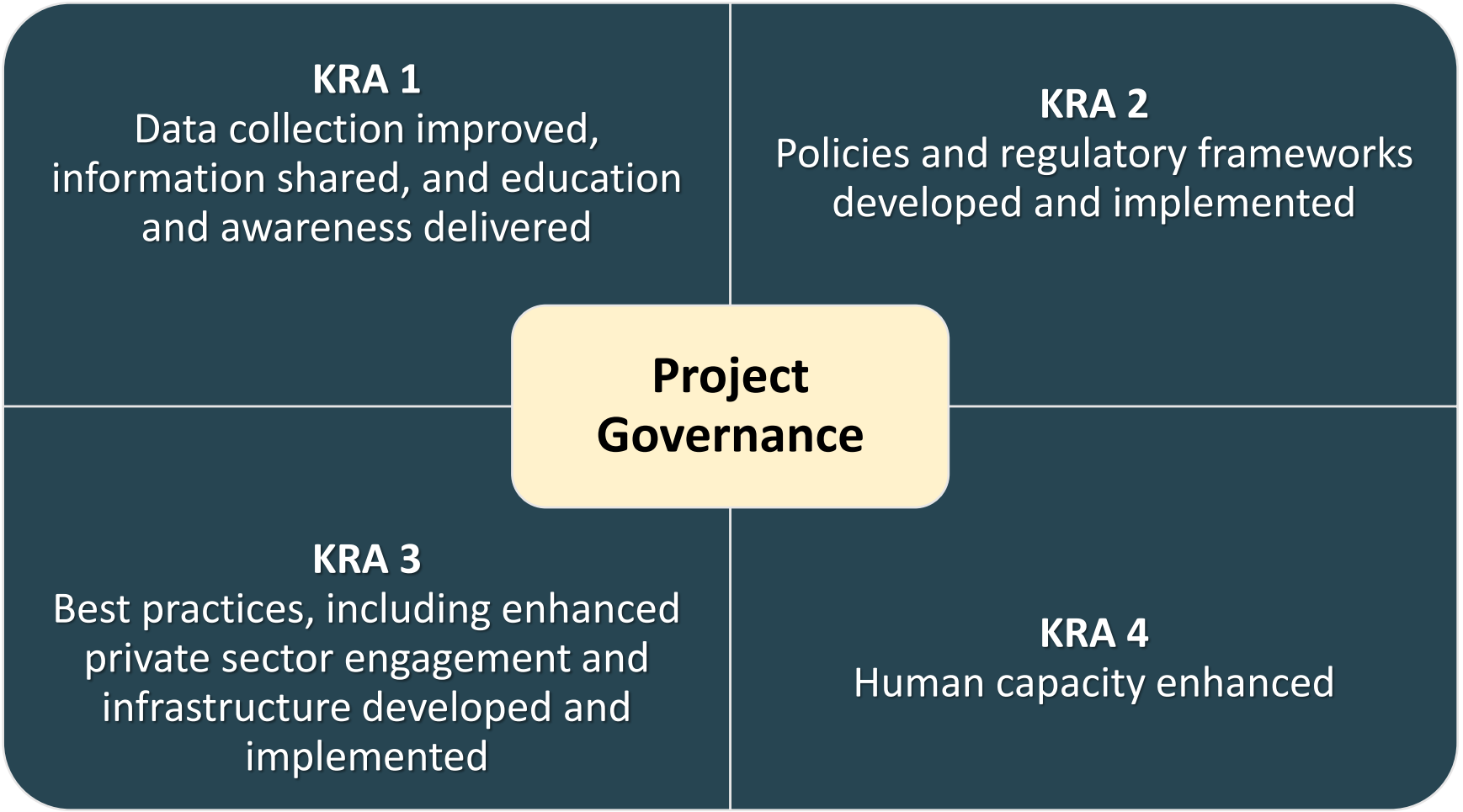
Hazardous Waste

Solid Waste

Waste Water

PacWastePlus Priority Waste Streams

PacWastePlus Key Result Areas



PacWastePlus Regional Projects

KRA 1 – Data, Information, and Education

- Regional Waste Management Data framework development
- Regional research activities (waste technology, landfill support, resource recovery)
- National Education & Awareness Plans and support

KRA 2 – Legislative Frameworks

- Waste licensing and Monitoring guidance
- Asbestos Management Model Policy, Model Code of Practice, and Landfill Guidelines
- Sustainable Financing: Advance Recovery Fee & Deposits
- **Disaster waste management task force**

KRA 3 – On-ground Action & Best Practice

- Disaster Waste Management taskforce set up
- Organics processing technologies and system establishment
- End-of-life vehicle management
- Re-use and Repair centres

KRA 4 – Capacity Building

- School education curriculum
- Waste management tertiary and vocational course development

National Cluster Taskforce

Country Disaster Resilience

Community Empowerment

DWM Training Manuals

Capacity Building

Guidelines

Stakeholder Partnership

National Disaster Management

Why

- Pacific Region is **vulnerable to Natural Disaster**
- **Enhance** countries **resilience to disaster**
- Proper **management** of **waste** generated from **natural disasters**.

- **Benefits:**
  - Incorporation of waste management into National Disaster Management Process
  - Empowerment of local communities to improve daily waste management
  - Enhance in-country capacity to manage high volume of waste generated following a disaster.

What

1. **Project to be implemented in a pilot county:**
   - Waste Management Cluster within NDMO
   - Develop and implement National Disaster Plan
   - Partnership Agreements with stakeholders
   - Training of first responders/ local officers
2. **From the learnings of the Pilot project appropriate resources will be developed to assist other countries:**
   - Development of Guidelines (*on establishment of Waste Management Cluster, Practitioner guideline, drafting National Disaster Waste Management Framework, and Partnership Agreement for effective management of DW*)
   - Development of Training Manual on DWM

Producing Guidelines to assist with mainstreaming waste management into national disaster management activities:

- Template and Instruction on drafting of National Disaster Waste Management Guideline
- Disaster Waste Estimation Methodology
- Terms of Reference and Establishment of Environment Cluster/ Disaster Waste Taskforce
- Video to guide local practitioners

PacWastePlus will be working with a pilot country to trial all guidelines before finalisation.

Thank you, Vinaka vakalevu !

Ms. Sainimili Bulai
PacWastePlus Project Technical Waste Officer
sainimilib@sprep.org

THANK YOU FOR YOUR VALUABLE PARTICIPATION AND WE ARE HAPPY TO ANSWER YOUR QUESTIONS

Visit our website to learn more

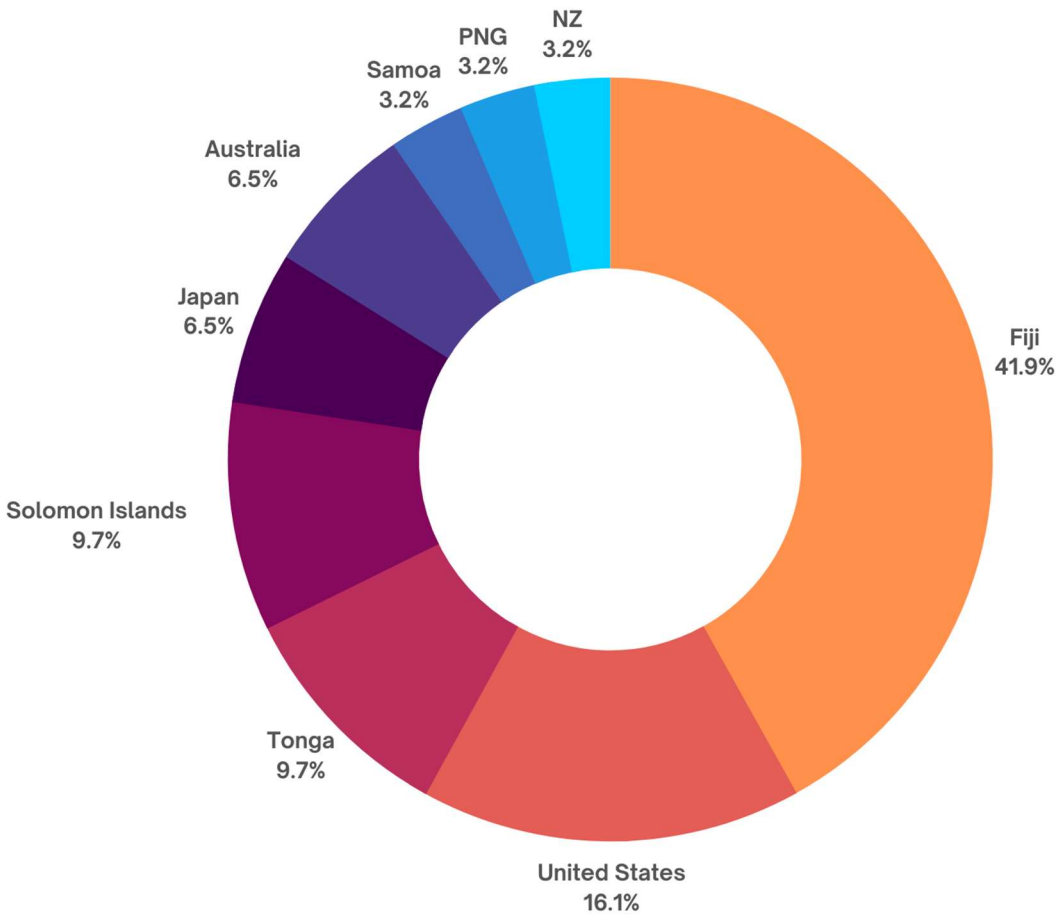
www.pacwasteplus.org

Appendix 6 – Post-Event Report

Registrants: 31 [Click here to download the list]

Regional Breakdown

Pie Chart



Table

Country	Count
Fiji	13
United States	5
Tonga	3
Solomon Islands	3
Japan	2
Australia	2
PNG	1
Samoa	1
New Zealand	1
Total	**31**

Findings: The country with the most number of registrations was Fiji with 13 people.

Virtual Attendance: 18 | This corresponds to the max (peak) attendance.

[Click here to see the Zoom report]

Future Actions & Recommendations

1) Strengthen the moderation

- As speakers went over their allocated time, we suggest strengthening the moderation to avoid going overtime.
- Setting a max. number of slides will also be helpful.
- One presentation for the workshop with all the slides? If possible.
- Speakers can record their presentations to have them as a backup in case they have tech issues and also to allocate time better.

2) Send the presentations a week before the conference

This will avoid last-minute issues such as presentations that had to be retrieved during the event itself.

Appendix 7 – Survey responses

#1

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Thursday, December 08, 2022 4:02:17 PM
Last Modified:	Thursday, December 08, 2022 4:05:14 PM
Time Spent:	00:02:57
IP Address:	103.14.89.162

Page 1

Q1 **Yes**

In general, are you satisfied with the Disaster Waste Management Workshop?

Q2 **Yes**

Was the length of the workshop appropriate?

Q3 **Yes**

Did the agenda and content of the Disaster Waste Management Workshop meet your expectations?

Q4 **Yes**

Were the topics covered in sufficient detail?

Q5 **Yes**

Was the quality of the interventions satisfactory?

Q6

What improvements could be made at the next workshop (length, content, format, etc.)?

The workshop has been nicely set up. Maintain current workshop structure and hopefully we can involve more stakeholders and projects to share their experiences in such workshop as they are rolled out in the future.

#2

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Thursday, December 08, 2022 4:02:27 PM
Last Modified:	Thursday, December 08, 2022 4:07:10 PM
Time Spent:	00:04:43
IP Address:	203.99.159.227

Page 1

Q1

In general, are you satisfied with the Disaster Waste Management Workshop?

Yes,
Comments:
This was a good opportunity for the region to learn from each other from their experiences in managing disaster wastes and assist each other to develop appropriate actions.

Q2

Was the length of the workshop appropriate?

Yes,
Comments:
Was satisfying

Q3

Did the agenda and content of the Disaster Waste Management Workshop meet your expectations?

Yes,
Comments:
Hearing the presentations from countries are quite suffice for the region in sharing knowledge and assistance.

Q4

Were the topics covered in sufficient detail?

Yes,
Comments:
So satisfying

Q5

Was the quality of the interventions satisfactory?

Yes,
Comments:
Very satisfying

Q6

What improvements could be made at the next workshop (length, content, format, etc.)?

A face to face workshop will be a good improvement

#3

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Tuesday, January 24, 2023 3:10:43 PM
Last Modified:	Tuesday, January 24, 2023 3:11:12 PM
Time Spent:	00:00:28
IP Address:	175.176.147.33

Page 1

Q1

In general, are you satisfied with the Disaster Waste Management Workshop?

Yes

Q2

Was the length of the workshop appropriate?

Yes

Q3

Did the agenda and content of the Disaster Waste Management Workshop meet your expectations?

Yes

Q4

Were the topics covered in sufficient detail?

Yes

Q5

Was the quality of the interventions satisfactory?

Yes

Q6

What improvements could be made at the next workshop (length, content, format, etc.)?

Respondent skipped this question