

## **Project Completion Report**

**Science Advice on Disaster Waste Management:  
Enabling Local Governments to Practice and Promote  
Building Back Better, Circular Economy, and Climate Change Mitigation**

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## INTRODUCTION

Disaster waste management (DWM) is a crucial task in the early phase of disaster recovery. The amounts of debris generated by devastating earthquakes, tsunamis, floods, and typhoons can overwhelm local capacity, affecting other important tasks such as rescue operations and the delivery of humanitarian aid. For example, the total amount of disaster waste generated by the 2013 Super Typhoon Haiyan reached 19 million tons. This quantity is equivalent to 137% of the estimated total waste generation in the entire Philippines for 2013. If local governments in cities and municipalities are unprepared, it can take weeks, months, or even years to dispose of disaster waste, possibly due to underestimation or lack of estimation of the amounts of waste. As a result, DWM can consume a significant portion of the disaster recovery cost. However, pre-disaster planning, and capacity-building can result in cost-effectiveness. It is therefore necessary to prepare in advance, considering likely scenarios in which enormous quantities of waste will be generated, including addressing policy gaps in disaster waste management as well as deficiencies in existing financial, technical, and institutional capacities. In the Philippines, the waste sector is the fourth largest contributor to greenhouse gas (GHG) emissions. If the enormous amounts of disaster waste going to landfills can be reduced, thereby reducing GHG emissions, this can significantly contribute to climate change mitigation.

Science advice can significantly enhance disaster waste management by predicting waste quantities, recommending waste treatment technologies, and assessing environmental impacts. It can inform policy development, optimize resource use, and provide training to build local capacity. Scientific methods aid in monitoring and evaluating DWM practices, reducing greenhouse gas emissions, and engaging communities. Interdisciplinary collaboration further integrates diverse expertise, leading to comprehensive strategies. Overall, science-driven approaches ensure effective, sustainable, and resilient waste management, minimizing the adverse effects of disasters on communities and the environment.

This project, titled **“Science Advice on Disaster Waste Management: Enabling Local Governments to Practice and Promote Building Back Better, Circular Economy, and Climate Change Mitigation,”** was funded by the International Network for Governmental Science Advice – Asia Chapter (INGSA-Asia) as part of its **Grassroots Science Advice Promotion Awards 2022**. As part of this award, the project received a seed grant worth EUR 1,000 and guidance and mentorship from Dr Toan Ngoc Dang, distinguished member of the INGSA-Asia Steering Committee. Two science advice activities were organized on July 20, 2023, in Makati City, Philippines: (1) the Forum on Access to Science Advice on Disaster Waste Management for Local Government Officials in the Philippines, and (2) the Enhancing Disaster Waste Management: Business Continuity Management (BCM) Seminar for Local Government Officials and MSWM Service Providers. The two events were held during the 2023 National Disaster Resilience Month. The forum and the seminar were reported as deliverables under the Sendai Framework Voluntary Commitment titled **“Disaster Waste Management Capacity Development for Local Governments in the Philippines.”** This project built on a completed project funded by the Asia-Pacific Network for Global Change Research (APN) titled **“Developing Capacity for Post-Typhoon Disaster Waste Management in Coastal Cities in China, Fiji, and the Philippines.”**

The support of collaborators from the following local and international organizations contributed to the success of the two events:

- Department of Environment and Natural Resources (DENR), Philippines
- Makati City Disaster Risk Reduction and Management Office
- Philippine Association for Disaster Waste Management (PADWM)
- University of the Philippines Resilience Institute (UPRI)
- National College of Public Administration and Governance (NCPAG), University of the Philippines – Diliman

- College of Engineering, University of the Philippines – Diliman
- University of the Philippines Institute of Civil Engineering
- Honing Agents for National Disaster Awareness (HANDA) Program, University of the Philippines Institute for Small-Scale Industries
- Sustainable Human Development Program, Development Academy of the Philippines (DAP)
- Department of Sociology and Behavioral Sciences, De La Salle University
- Solid Waste Management Association of the Philippines (SWAPP)
- Philippine Disaster Resilience Foundation (PDRF)
- Business Continuity Managers Association of the Philippines (BCMAP)
- U-INSPIRE Philippines
- Philippine Institute of Environmental Planners (PIEP)
- Japan Society of Material Cycles and Waste Management (JSMCWM)
- Graduate School of Global Environmental Studies, Kyoto University, Japan
- Disaster Mitigation Research Center, Nagoya University, Japan
- Department of Civil Engineering, Fukuoka University, Japan
- NTT DATA Institute of Management Consulting, Inc., Japan
- Faculty of Resilience, Rabdan Academy, United Arab Emirates
- Central Highlands Center for Community Development and Climate Change Adaptation (CHCC), Viet Nam
- Institute for Disaster Management and Reconstruction, Sichuan University – Hong Kong Polytechnic University, China
- Integrated Research on Disaster Risk (IRDR) Young Scientists Programme, China
- Asia-Pacific Network for Global Change Research (APN), Japan



Figure 1. In-person and online participants of the two science advice events held on July 20, 2023

The concept notes of the forum and seminar are shown below. Additional information is posted on the website of the Philippine Association for Disaster Waste Management (PADWM):

<https://disaster-waste.org/>



## BACKGROUND

One critical aspect of disaster management is the proper management of disaster waste. Scientific knowledge and expertise play a vital role in formulating effective waste management strategies to mitigate the public health and environmental risks associated with disaster waste. Local government officials in the Philippines are at the forefront of disaster response and recovery efforts. However, accessing accurate and timely science advice related to disaster waste management can be challenging. This forum aims to address this issue by bringing together stakeholders to discuss ways to enhance access to science advice for local government officials in the Philippines, specifically in the context of disaster waste management.

## OBJECTIVES

The primary objectives of the forum are as follows:

- a) To raise awareness among local government officials about the importance of science advice in disaster waste management.
- b) To provide a platform for knowledge sharing and dialogue between scientists, researchers, and local government officials regarding best practices and scientific advancements in disaster waste management.
- c) To identify mechanisms and strategies to improve the accessibility of science advice for local government officials.
- d) To foster collaborations and partnerships between scientific institutions, government agencies, and local government units to support evidence-based decision-making in disaster waste management.

## TARGET AUDIENCE

The forum primarily targets the following participants:

- a) Local government officials, including mayors, councilors, and environmental officers.
- b) Scientists, researchers, and experts in the field of disaster waste management.
- c) Representatives from relevant government agencies, such as the Department of Environment and Natural Resources (DENR), Department of Science and Technology (DOST), Department of Interior and

Local Government (DILG), and the National Disaster Risk Reduction and Management Council (NDRRMC).

d) Non-governmental organizations (NGOs) and civil society organizations working on disaster management and environmental issues, such as the Philippine Institute of Environmental Planners (PIEP), the Solid Waste Management Association of the Philippines (SWAPP), U-INSPIRE Philippines, and the Philippine Association for Disaster Waste Management (PADWM).

e) Academics and students involved in disaster waste management research.

## **OUTCOMES**

The forum aims to achieve the following outcomes:

a) Increased awareness among local government officials about the importance of science advice in disaster waste management.

b) Enhanced understanding of best practices and scientific advancements in disaster waste management.

c) Identification of strategies and mechanisms to improve the accessibility of science advice for local government officials.

d) Strengthened partnerships and collaborations between scientific institutions, government agencies, and local government units.

e) Development of a summary report capturing key insights, recommendations, and actionable steps for future implementation.

## PROGRAM

10:00	10:10	Opening remarks
10:10	10:20	Introduction to the forum and its objectives <b>Dr. Glenn Fernandez</b> , Associate Professor, Faculty of Resilience, Rabdan Academy; member, Future Earth Assembly
10:20	10:35	Keynote speech <b>Dr. Kristoffer Berse</b> , Dean and Associate Professor, National College of Public Administration and Governance (NCPAG), University of the Philippines – Diliman; Director for Research and Creative Work, UP Resilience Institute
10:35	10:50	Keynote speech <b>Dr. Toan Ngoc Dang</b> , Steering Committee Member, International Network for Government Science Advice – Asia Chapter; CEO and Founder, Central Highlands Center for Community Development and Climate Change Adaptation (CHCC)
10:50	11:05	Japan’s technical assistance to the Metro Manila Development Authority (MMDA) in establishing a disaster waste management guideline <b>Mr. Shintaro Higashi</b> , Senior Manager, NTT DATA Institute of Management Consulting, Inc.; member, Japan Society of Material Cycles and Waste Management
11:05	11:20	Practical implementation of business continuity management in Japan in the context of disaster waste management <b>Dr. Nagahisa Hirayama</b> , Associate Professor, Disaster Mitigation Research Center, Nagoya University
11:20	12:05	Panel discussion and open forum <ul style="list-style-type: none"><li>▪ <b>Dr. Noralene Uy</b>, Assistant Secretary, Department of Environment and Natural Resources (DENR)</li><li>▪ <b>Dr. Maria Antonia Tanchuling</b>, Dean and Professor, College of Engineering, University of the Philippines – Diliman</li><li>▪ <b>Ms. Dorothea Navarro</b>, Director, Sustainable Human Development Program, Development Academy of the Philippines</li><li>▪ <b>Dr. Marlon de Luna Era</b>, President, Solid Waste Management Association of the Philippines; Associate Professor and Chair, Department of Sociology and Behavioral Sciences, De La Salle University</li></ul>
12:05	12:20	Makati’s disaster waste management contingency planning: the role of science advice <b>EnP Liza Velle Ramos</b> , Research and Development Head, Makati City Disaster Risk Reduction and Management Office
12:20	12:30	Closing remarks <b>Dr. Gretchen Kalonji</b> , Dean and Professor, Institute for Disaster Management and Reconstruction, Sichuan University – Hong Kong Polytechnic University
12:30	14:00	Networking and lunch



## **BACKGROUND**

Disasters pose significant challenges to the effective management of municipal solid waste in the Philippines. Disruptions caused by disasters can lead to increased waste generation, inadequate waste collection and disposal systems, and environmental and public health risks. To mitigate these challenges, it is crucial for local government officials and municipal solid waste management (MSWM) service providers to have effective strategies in place to ensure the continuity of waste management operations during and after disasters. Business Continuity Management (BCM) provides a framework for identifying potential risks, developing strategies to minimize disruptions, and ensuring the swift recovery of essential services. This seminar aims to introduce and promote the application of BCM principles and practices among local government officials and MSWM service providers in the Philippines, specifically in the context of disaster waste management.

## **OBJECTIVES**

The primary objectives of the forum are as follows:

- a) To enhance understanding among local government officials and MSWM service providers about the importance of business continuity management in disaster waste management.
- b) To familiarize participants with key concepts, frameworks, and best practices in BCM related to disaster waste management.
- c) To provide practical guidance on developing BCM plans and strategies tailored to the specific needs of MSWM service providers and local government units.
- d) To facilitate knowledge sharing and networking among participants to promote collaboration and shared learning.

## **TARGET AUDIENCE**

The forum primarily targets the following participants:

- a) Local government officials responsible for disaster management, environmental protection, and waste management at the municipal and city levels.
- b) MSWM service providers, including waste collection companies, recycling facilities, and landfill operators.

c) Representatives from relevant government agencies, such as the Department of Environment and Natural Resources (DENR), Department of Interior and Local Government (DILG), and Department of Public Works and Highways (DPWH), Metro Manila Development Authority (MMDA), and the National Disaster Risk Reduction and Management Council (NDRRMC).

d) Subject matter experts in disaster management, waste management, and business continuity planning.

e) Non-governmental organizations (NGOs) and civil society organizations working on disaster management and waste management issues, such as the Philippine Institute of Environmental Planners (PIEP), the Solid Waste Management Association of the Philippines (SWAPP), U-INSPIRE Philippines, and the Philippine Association for Disaster Waste Management (PADWM).

## **OUTCOMES**

The seminar aimed to achieve the following outcomes:

a) Increased awareness among local government officials and MSWM service providers about the importance of BCM in disaster waste management.

b) Enhanced understanding of BCM principles, frameworks, and best practices in the context of disaster waste management.

c) Development of practical skills and knowledge for developing and implementing BCM plans and strategies tailored to MSWM service



## PROGRAM

14:00	14:10	Opening remarks
14:10	14:20	Introduction to the seminar objectives and an overview of the importance of BCM in disaster waste management <b>Dr. Glenn Fernandez</b> , Associate Professor, Rabdan Academy; member, Future Earth Assembly
14:20	14:35	Keynote speech <b>Ms. Veronica Gabaldon</b> , Executive Director, Philippine Disaster Resilience Foundation
14:35	14:50	Keynote speech <b>Dr. Noralene Uy</b> , Assistant Secretary, Department of Environment and Natural Resources (DENR)
14:50	15:05	Disaster waste management experience in the 2011 Great East Japan Earthquake and Tsunami, highlighting the role of cities <b>Dr. Misuzu Asari</b> , Associate Professor, Graduate School of Global Environmental Studies, Kyoto University; member, Japan Society of Material Cycles and Waste Management
15:05	15:20	Practical guidance in developing customized BCM plans and strategies for MSWM service providers and local government units based on Japanese experience <b>Dr. Shinya Suzuki</b> , Associate Professor, Department of Civil Engineering, Fukuoka University; member, Japan Society of Material Cycles and Waste Management
15:20	15:35	Multi-criteria evaluation of suitable locations for temporary storage sites for disaster wastes in Cavite <b>Ms. Ma. Brida Lea D. Diola</b> , Assistant Professor, University of the Philippines Institute of Civil Engineering; IRDR Young Scientist
15:35	15:50	Implementing BCM in the waste management sector in the Philippines: tips and pointers for service providers <b>Ms. Joanna Rose T. Laddaran</b> , HANDA Program Focal Person, UP Institute for Small-Scale Industries; Director for Diversity and Inclusions, Business Continuity Managers Association of the Philippines (BCMAP)
15:50	16:20	Question and Answer Session
16:20	16:30	Closing Remarks

## **CONCLUSION**

The completion of the project titled “Science Advice on Disaster Waste Management: Enabling Local Governments to Practice and Promote Building Back Better, Circular Economy, and Climate Change Mitigation” marks a significant milestone in enhancing disaster resilience and sustainable waste management practices. Funded by the International Network for Government Science Advice – Asia Chapter (INGSA-Asia) through its Grassroots Science Advice Promotion Awards 2022, the project successfully organized two key events during the 2023 National Disaster Resilience Month. These events, the Forum on Access to Science Advice on Disaster Waste Management and the Business Continuity Management Seminar, brought together local government officials, scientists, and various stakeholders to discuss best practices and strategies for disaster waste management. The support from numerous local and international organizations was instrumental in achieving the project's objectives. This initiative has not only raised awareness about the importance of science advice in disaster waste management but also fostered collaboration and knowledge sharing among participants. Moving forward, the insights and partnerships developed through this project will continue to contribute to the resilience and sustainability of local governments in managing disaster waste, ultimately mitigating the adverse effects on communities and the environment. Additionally, the project has led to an increase in membership to the Philippine Association for Disaster Waste Management (PADWM), further strengthening the network of professionals dedicated to improving disaster waste management practices.

## FUNDING

The organization of the two events was supported by the International Network for Government Science Advice – Asia Chapter (INGSA-Asia) and the Makati City Disaster Risk Reduction and Management Office. After deducting the remittance and other bank charges, the amount received from INGSA-Asia on April 20, 2023 was **PHP 59,791.19**.

Here is the breakdown of the funds provided by INGSA-Asia and the Makati City Disaster Risk Reduction and Management Office.

<b>Items</b>	<b>PHP</b>	<b>Euro</b>
1. Venue and equipment	c/o Makati City Government	
2. Lunch	c/o Makati City Government	
3. Honoraria		
▪ 9 speakers x PHP 5,000	45,000.00	713.09
▪ 4 technical and events staff x PHP 2,120	8,480	134.38
▪ 3 support services staff x PHP 2,120	6,360	100.78
<b>TOTAL</b>	<b>59,840.00</b>	<b>948.26</b>

Exchange rates: USD 1 = PHP 56.921 = EUR 0.902

Reference: <https://treasury.un.org/operationalrates/OperationalRates.php>