

*Environment in Humanitarian Action: Global Training Manual Template*

# Sustainable Waste Management in Humanitarian Contexts







*This module was developed as part of the UNEP/OCHA Joint Environment Unit's project titled Localisation of Environment in Humanitarian Action, and is part of a template of a training manual consisting of:*

- 1 Introductory Module*
- 11 Technical Modules*
- 1 ToT Module*

*The template is an open source and available for any organisation or individual to use or refer to in the development and delivery of their Environment in Humanitarian Action training.*

*What distinguishes this training manual is its comprehensive and flexible framework. We encourage users to adjust the content to meet with the specific needs within their specific Contexts. We kindly ask that credit is given when using or adapting this resource.*

# MODULE OVERVIEW

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This module provides an in-depth exploration of sustainable waste management practices within humanitarian contexts. Participants will examine the various types of waste generated during humanitarian operations, the environmental and health impacts of improper waste management, and best practices for managing waste sustainably. Through practical exercises, case studies, and discussions, participants will learn to design and implement effective waste management strategies tailored to diverse humanitarian scenarios. The module also addresses the challenges of waste management in emergency settings, offering innovative solutions and highlighting the importance of community engagement in achieving sustainable outcomes.

## Learning outcomes

By the end of this module, participants will:

1. Identify and understand the different types of waste generated in humanitarian settings and the specific challenges they pose.
2. Apply the principles of sustainable waste management in various emergency scenarios, ensuring environmental and health protection.
3. Design effective waste management strategies that minimize environmental impact and enhance the sustainability of humanitarian operations.
4. Analyze case studies to extract best practices and innovative solutions in waste management from real-world humanitarian contexts.
5. Engage communities effectively in sustainable waste management practices, recognizing both the social impacts and the importance of community participation.
6. Address challenges in waste management by developing practical solutions and adapting strategies to overcome obstacles in diverse humanitarian settings.

## Estimated delivery time

**Total time:** 190 minutes

# CONTENT OUTLINE

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<b>1. Introduction to waste management in humanitarian settings</b>	<b>04</b>
<ul style="list-style-type: none"><li>◦ Overview of waste types and their environmental and health impacts in humanitarian contexts</li><li>◦ The importance of waste management in emergencies</li><li>◦ Key principles of sustainable waste management</li></ul>	
<b>2. Practical approaches to waste management</b>	<b>07</b>
<ul style="list-style-type: none"><li>◦ Key steps in designing waste management systems</li><li>◦ Application of waste management practices in humanitarian contexts</li><li>◦ Innovative solutions and technologies for waste management</li></ul>	
<b>3. Challenges and strategic solutions in waste management</b>	<b>09</b>
<ul style="list-style-type: none"><li>◦ Overview of key challenges in implementing effective waste management</li><li>◦ Solutions and real-world examples of overcoming these challenges</li><li>◦ Social impacts of waste management</li></ul>	
<b>4. Case studies and best practices</b>	<b>12</b>



# FACILITATOR'S GUIDE

Step	Activity	Method	Duration	Materials Needed	Expected Outcomes
1	<b>Introduce the module.</b> Provide an overview of the module, its objectives, and the schedule.	Presentation, plenary discussion	10 mins	Slides, handouts	Participants understand the module's objectives and structure.
2	<b>Explain the overview of waste types,</b> importance of waste management, and key principles of sustainable waste management.	Lecture, plenary discussion	25 mins	Slides, handouts	Participants understand the various waste types and the importance of sustainable waste management in humanitarian contexts.
3	<b>Facilitate a Q&amp;A session on waste management practices.</b> Participants ask questions and discuss key points from the previous lecture.	Q&A, plenary discussion	20 mins	None	Participants reinforce their understanding of waste management practices and principles.
4	<b>Introduce practical approaches to waste management.</b> Discuss the key steps in designing waste management systems.	Lecture, demonstration	20 mins	Slides, handouts	Participants learn the key steps involved in designing effective waste management systems.
5	<b>Conduct a group exercise:</b> Applying waste management practices in different contexts. Participants work in groups to design waste management strategies for various humanitarian contexts.	Group work, presentation	30 mins	Flipchart, markers, case study materials	Participants develop practical skills in designing waste management strategies for specific contexts.
6	<b>Present and discuss innovative solutions</b> and technologies for waste management. Highlight and discuss various innovative waste management technologies and their applications.	Presentation, plenary discussion	25 mins	Slides, case study materials	Participants gain insights into innovative solutions and technologies for waste management in humanitarian contexts.
7	<b>Analyze challenges in waste management in humanitarian action.</b> Discuss key challenges and explore solutions through real-world examples.	Lecture, plenary discussion	20 mins	Slides, case study materials	Participants understand the challenges in waste management and learn strategies to overcome them.

8	<b>Facilitate a group exercise:</b> Addressing waste management challenges. Participants work in groups to develop solutions to challenges faced in waste management.	Group work, presentation	30 mins	Flipchart, markers	Participants apply their knowledge to develop strategies for overcoming waste management challenges.
9	<b>Wrap up the session.</b> Summarize the key takeaways and address any remaining questions.	Presentation, Q&A	10 mins	Slides	Participants reinforce their learning and clarify any final doubts.

## Facilitator notes

# Section 1: Introduction to waste management in humanitarian settings

### Key points

- Waste management is essential in humanitarian settings to prevent health hazards, environmental degradation, and social disruption.
- Understanding the definition of waste and the different types of waste is crucial for effective management.
- Sustainable waste management practices should be integrated into all stages of humanitarian interventions, and following the waste management hierarchy of Reduce, Reuse, and Recycle.

### Background information

- Waste is typically defined as any material that is discarded, unwanted, or considered worthless. It can include solid materials, liquids, or gases that are byproducts of human activity.
- Items that can be reused, recycled, or recovered for future use are not considered waste in a strict sense. For instance, excess food redistributed to people in need or construction materials repurposed for shelter are not classified as waste.
- In emergency situations, the rapid influx of people and limited infrastructure can lead to significant waste management challenges. Without proper waste management systems, there is a high risk of environmental contamination, disease outbreaks, and long-term ecological damage.
- The types of waste generated in humanitarian settings vary widely, from solid waste to hazardous and medical waste, each requiring different management strategies.
- Effective waste management not only protects the environment but also improves the overall health and well-being of affected populations. It contributes to the sustainability of humanitarian interventions by reducing the environmental footprint and promoting resource efficiency.
- Waste management is also intrinsically linked to climate change mitigation efforts. Poorly managed waste, such as organic waste, can lead to methane emissions—a potent greenhouse gas that contributes to climate change. Conversely, effective waste management can reduce environmental degradation, supporting ecosystem resilience and reducing the overall impact on the climate.

## Content development: Introduction to waste management in humanitarian settings

Table 1: Overview of waste types and their environmental and health impacts in humanitarian contexts

Waste Type	Description	Impacts	Examples
<b>Solid waste</b>	Non-liquid waste materials generated from everyday activities, including household, commercial, and industrial sources.	Land pollution: in humanitarian settings, improperly managed solid waste can lead to the accumulation of waste in and around refugee camps or temporary settlements, contaminating the land and making areas unsuitable for future use. Water pollution: runoff from waste piles in camps can contaminate local water sources, making them unsafe for drinking and leading to waterborne diseases among displaced populations. Health hazard: uncollected solid waste attracts pests and vectors such as rats and mosquitoes, increasing the risk of disease outbreaks, including malaria and dengue fever, among vulnerable populations. Reduced livability: accumulation of solid waste in and around living areas can severely degrade the quality of life for displaced persons, making camps unsanitary and unsafe. Aesthetic impact: unmanaged waste contributes to visual pollution and can reduce the aesthetic value of an area, affecting tourism and quality of life. Marine pollution: mismanaged solid waste can enter waterways and contribute to ocean pollution, harming marine life.	Disasters: Earthquakes and floods generate large amounts of rubble and debris, which, if not managed, can hinder relief efforts. Conflict: Military actions lead to the destruction of infrastructure, creating significant waste that complicates the provision of aid. Humanitarian action: Refugee camps produce significant amounts of solid waste, including plastic packaging and disposable items, that need effective management to prevent health and environmental crises.
<b>Hazardous waste</b>	Waste containing toxic, corrosive, flammable, or reactive substances that pose significant health and environmental risks.	Environmental contamination: in humanitarian operations, improper disposal of hazardous waste like chemicals, batteries, and medical waste can lead to soil and water contamination, impacting both the environment and the health of displaced populations. Health risks: direct exposure to hazardous waste, such as in makeshift healthcare facilities, can cause acute poisoning or long-term health issues among aid workers and affected populations. Fire and explosions: improperly stored hazardous waste, such as fuel containers in camps, can cause fires or explosions, leading to further displacement and injury. Long-term ecosystem damage: persistent toxic chemicals from hazardous waste can disrupt local ecosystems, which may take years to recover, affecting local livelihoods and food security. Groundwater contamination: leachate from hazardous waste can infiltrate groundwater, posing risks to drinking water supplies.	Disasters: Industrial spills during natural disasters can release hazardous materials into the environment, complicating relief efforts. Conflict: The use of certain weapons and military equipment generates hazardous waste that can linger in the environment, posing long-term risks. Humanitarian action: Managing medical waste, such as syringes and expired medications, in field hospitals or clinics is critical to preventing environmental contamination and safeguarding health.



<p><b>Electronic waste (e-waste)</b></p>	<p>Discarded electronic devices and components, including computers, mobile phones, and batteries, that contain hazardous materials.</p>	<p>Toxic leachate: in humanitarian settings, e-waste from destroyed communication equipment can lead to toxic leachate contaminating local water sources, posing a significant health risk to displaced populations. Air pollution: burning e-waste, a common practice in low-resource settings, releases toxic fumes that can exacerbate respiratory problems in already vulnerable populations. Resource misuse: in humanitarian operations, the loss of valuable materials through improper e-waste disposal can strain limited resources, as there is often a need to replace expensive electronic equipment. Informal recycling health risks: in some crisis-affected areas, e-waste is managed through informal recycling, exposing workers and residents to harmful chemicals without proper safety measures. Long-term environmental degradation: non-biodegradable components persist in the environment, contributing to pollution.</p>	<p>Disasters: Damaged communication infrastructure, including mobile phones and radios, contributes to e-waste that needs careful handling to avoid further environmental harm. Conflict: Electronic devices used in conflict zones, such as communication equipment, become e-waste when damaged or outdated, requiring safe disposal. Humanitarian action: Broken or outdated emergency communication devices, batteries, and solar panels used in relief operations must be managed to prevent environmental and health hazards.</p>
<p><b>Organic waste</b></p>	<p>Biodegradable waste from food, plant materials, and agricultural activities that can decompose naturally.</p>	<p>Methane emissions: in humanitarian settings, organic waste like food scraps can produce methane, a potent greenhouse gas, when left to decompose in unmanaged piles. Disease outbreaks: organic waste, if not properly disposed of, can attract pests that carry diseases, which can quickly spread in crowded refugee camps. Water contamination: leachate from decomposing organic waste can infiltrate into local water supplies, leading to the contamination of drinking water and increasing the risk of diseases like cholera. Missed opportunities for soil fertility: properly managed, composted organic waste could be used to improve soil fertility, supporting reforestation or agricultural activities in post-disaster recovery. Odor nuisance: decomposing organic waste can produce unpleasant odors, reducing the quality of life in nearby areas.</p>	<p>Disasters: Power outages leading to food spoilage generate significant organic waste, which must be managed to prevent health hazards. Conflict: Spoiled food supplies in conflict zones create waste that, if left unmanaged, can contribute to environmental degradation. Humanitarian action: Waste from feeding programs in camps, if not composted or properly disposed of, can attract pests and contribute to the spread of disease.</p>
<p><b>Construction debris</b></p>	<p>Waste generated from building, renovating, or demolishing structures, including concrete, wood, metals, and other materials.</p>	<p>Physical hazards: construction debris in humanitarian settings, such as in disaster-stricken areas, can create dangerous obstacles, impeding relief efforts and endangering the lives of both aid workers and affected populations. Habitat destruction: large amounts of construction debris can lead to the destruction of local habitats, further stressing ecosystems already damaged by the disaster or conflict. Resource depletion: inadequate recycling of construction materials increases demand for new resources, which may be scarce in post-disaster scenarios. Air and water pollution: dust and particulate matter from construction debris contribute to air pollution, while runoff from debris piles can contaminate local water bodies.</p>	<p>Disasters: Rebuilding efforts after a disaster generate significant debris that must be managed to allow for effective recovery operations. Conflict: Debris from destroyed infrastructure in conflict zones can hinder the delivery of humanitarian aid. Humanitarian action: Temporary structures built during disaster response generate waste that needs careful disposal to prevent long-term environmental damage.</p>

Table 2: Importance of waste management in humanitarian settings







Aspect	Description	Environmental Impact Assessment
 <p><b>Health protection</b></p>	Proper waste management prevents the spread of diseases and reduces health risks associated with poor sanitation.	Managing waste in a refugee camp to prevent the spread of vector-borne diseases, particularly in areas where faecal matter might contaminate water sources.
 <p><b>Environmental conservation</b></p>	Reduces environmental degradation by minimizing pollution, conserving resources, and protecting ecosystems.	Implementing waste segregation and recycling programs in disaster recovery operations, ensuring that hazardous waste does not contaminate local water bodies.
 <p><b>Resource efficiency</b></p>	Encourages the efficient use of resources by promoting recycling, reuse, and reducing waste generation.	Reusing construction materials in the rebuilding phase after a disaster, thereby reducing the amount of debris in the environment.
 <p><b>Compliance with regulations</b></p>	Ensures that waste management practices adhere to local and international environmental laws and standards.	Aligning waste disposal practices with local environmental laws in post-disaster recovery, particularly in handling hazardous waste like faecal sludge.
 <p><b>Community well-being</b></p>	Supports the dignity and well-being of affected populations by maintaining clean and safe living environments.	Establishing regular waste collection in temporary shelters to improve living conditions, particularly in managing organic waste and faecal matter.
 <p><b>Long-term recovery and resilience</b></p>	Facilitates long-term recovery and resilience by promoting sustainable waste management practices that can be maintained post-crisis.	Integrating waste management into reconstruction efforts to ensure sustainable development, with a focus on proper solid waste management to prevent future contamination.

Table 3: Key principles of sustainable waste management

Principle	Description	Importance	Example/Application
<b>Waste minimization</b>	Best option for waste management. Reducing the amount of waste generated by promoting efficient use of resources and minimizing unnecessary waste production.	Reduces the environmental footprint of humanitarian operations and conserves resources for future use.	Implementing programs that encourage the reduction of plastic use in relief distributions.
<b>Waste segregation</b>	Separating waste at the source into different categories (e.g., recyclables, organic waste, hazardous waste) for appropriate disposal.	Ensures that waste is handled and disposed of correctly, reducing contamination and promoting recycling.	Setting up waste segregation stations in refugee camps to separate recyclables from general waste, ensuring that hazardous waste like faecal matter is properly managed.

<b>Reuse</b>	Encouraging the reuse of items that would otherwise be discarded as waste.	Reduces waste by reusing items for same or different purposes.	Implementing programs to deliver relief items in containers that can be reused for storage.
<b>Recycling</b>	Encouraging the recycling of materials to reduce the demand for new resources and minimize waste.	Extends the lifecycle of materials and reduces the amount of waste sent to landfills or incinerators.	Establishing recycling programs in disaster recovery operations to reclaim materials for future use.
<b>Safe disposal</b>	Ensuring that waste that cannot be recycled or reused is disposed of in a manner that minimizes environmental and health risks.	Protects the environment and public health by preventing the release of harmful substances into the ecosystem.	Constructing secure landfills for hazardous waste generated during a humanitarian response, ensuring that faecal sludge is safely contained to prevent contamination.
<b>Environmental education and awareness</b>	Raising awareness and educating affected populations and humanitarian workers on sustainable waste management practices.	Empowers communities and workers to take an active role in waste management, leading to more effective and sustainable outcomes.	Conducting workshops on waste management for residents of temporary shelters, with a focus on the 3 Rs: Reduce, Reuse Recycle.

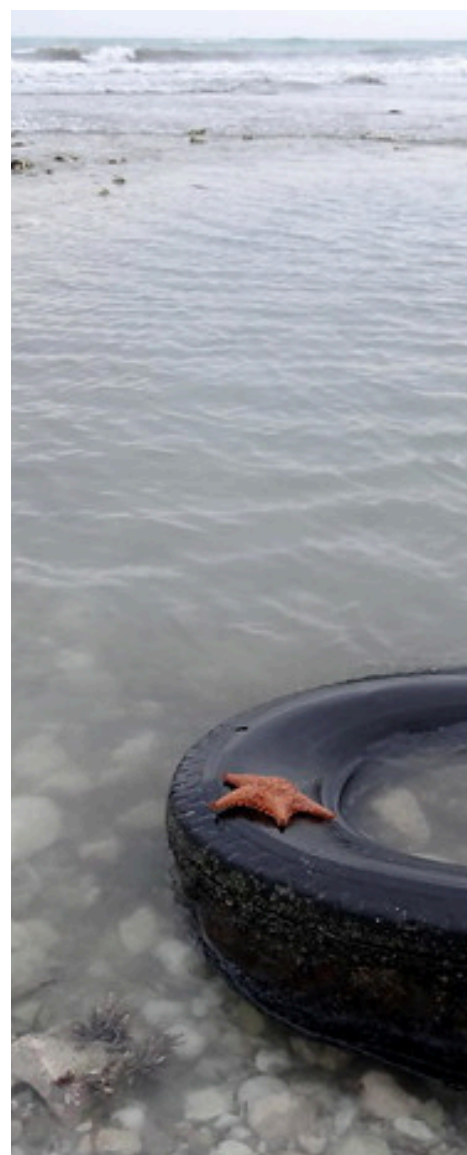
## Section 2: Practical approaches to waste management

### Key points

- Focus on the application of waste management practices in different humanitarian contexts, addressing the unique challenges and opportunities presented by each scenario.
- Highlight innovative solutions and technologies that can enhance the effectiveness and sustainability of waste management efforts in emergencies.

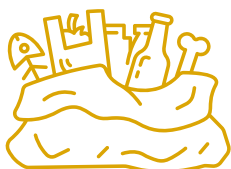
### Background information

- In humanitarian settings, effective waste management is crucial for protecting public health and minimizing environmental impacts. Different contexts require tailored approaches that take into account local conditions, available resources, and specific needs.
- Innovative technologies and practices can significantly improve waste management outcomes, particularly in resource-constrained environments. These solutions not only address immediate waste management challenges but also contribute to long-term sustainability.
- Waste management should be a key component of comprehensive humanitarian action plans, ensuring that it is not treated as an isolated task but as part of the overall response strategy.
- This integration helps in aligning waste management goals with other humanitarian activities, such as shelter, WASH (Water, Sanitation, and Hygiene), and health interventions, to create a cohesive response that maximizes resource efficiency and effectiveness.



## Content development: Practical approaches to waste management

### Key steps in designing waste management systems



#### Assessment of waste generation

Evaluate the types and volumes of waste expected in the specific humanitarian context. This includes understanding the sources of waste and the potential environmental impacts.

##### Example/Application

Conducting a waste audit in a newly established refugee camp to identify the types of waste generated (e.g., organic waste, plastic, hazardous waste) and estimate volumes.- Use Disaster waste management Guidelines e.g. UNEP/OCHA JEU's guideline

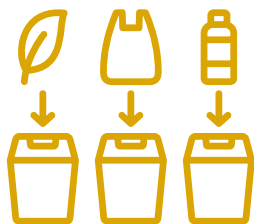


#### Selection of appropriate waste management technologies

Choose technologies and practices that are suitable for the local context, considering factors like resource availability, existing local waste management infrastructure, environmental conditions, and cultural appropriateness.

##### Example/Application

- Selecting composting toilets for a camp in a region with limited water resources, ensuring that the waste management solution is both sustainable and culturally acceptable.



#### Implementation and coordination

Implement the waste management system in coordination with other humanitarian activities, ensuring that roles and responsibilities are clearly defined among stakeholders.

##### Example/Application

- Coordinating waste collection schedules with food distribution times in a disaster response site to ensure efficiency and reduce waste buildup.



#### Monitoring and adaptation

Continuously monitor the effectiveness of the waste management system and adapt it as needed based on feedback, changes in waste volumes, or evolving conditions.

##### Example/Application

- Regularly reviewing the effectiveness of waste segregation practices in a camp and making adjustments to improve compliance and reduce contamination.



Table 3: Innovative solutions and technologies for waste management

Innovation/Technology	Description	Advantages	Examples/Application
<b>Solar-powered waste compactors</b>	Compact waste on-site using solar energy, reducing the volume of waste and minimizing the need for frequent collection.	Reduces the frequency of waste collection, lowers transportation costs, and is energy-efficient.	Solar-powered compactors were deployed in refugee camps in Kenya, significantly reducing the volume of solid waste and the need for frequent waste collection.
<b>Eco-bricks</b>	Convert non-recyclable plastic waste into bricks for construction by packing plastic tightly into bottles.	Provides a use for non-recyclable waste, reducing environmental pollution while producing building materials.	In disaster recovery projects in the Philippines, eco-bricks made from plastic waste were used to build community centers and schools.
<b>Biogas systems</b>	Convert organic waste into biogas for cooking or electricity, reducing the need for traditional fuel sources.	Provides a renewable energy source, reduces organic waste, and minimizes deforestation.	In a refugee camp in Rwanda, biogas systems were installed to convert food waste into cooking fuel, reducing reliance on firewood.
<b>Mobile waste treatment units</b>	Portable units that treat waste on-site, particularly hazardous waste, reducing the need for transportation to treatment facilities.	Allows for immediate treatment of waste, especially in conflict zones or remote locations, reducing environmental risks.	Mobile waste treatment units were used in Yemen to manage hazardous waste generated from medical facilities in conflict-affected areas.
<b>Waterless toilets</b>	Sanitation solutions that do not require water, often using chemical or biological processes to treat waste.	Ideal for water-scarce environments, reduces the risk of water contamination, and is easy to maintain.	In drought-affected regions of Ethiopia, waterless toilets were introduced in IDP camps, reducing the strain on local water resources.

## Section 3: Challenges in waste management in humanitarian action

### Key points

- Identify and discuss the primary challenges encountered in waste management during humanitarian interventions.
- Highlight practical solutions and strategies that have been successfully implemented to overcome these challenges.
- Provide real-world examples to illustrate how these challenges have been addressed in various humanitarian contexts.

### Background information

- Waste management in humanitarian settings faces numerous obstacles, ranging from logistical constraints to limited resources and cultural factors. The complexity of these challenges often leads to ineffective waste management practices, which can exacerbate environmental degradation and pose serious health risks to affected communities.
- Addressing these challenges requires innovative approaches, strong coordination among stakeholders, and the integration of sustainable practices into humanitarian planning and operations. By understanding these challenges and exploring successful case studies, humanitarian actors can improve waste management outcomes in future interventions.



Table 1: Key challenges in waste management in humanitarian action

Challenge	Description	Solutions	Examples/Application
<b>Logistical constraints</b>	Difficulty in transporting waste to disposal or treatment sites due to damaged infrastructure or remote locations.	<ul style="list-style-type: none"> <li>- Use of mobile waste treatment units.</li> <li>- Establishment of temporary waste collection points.</li> <li>- Coordination with local authorities for waste management.</li> <li>- Establish a reverse logistics program to bring back waste to manufacturers for reuse, recycling, or disposal.</li> </ul>	<ul style="list-style-type: none"> <li>- Deploying mobile incinerators in disaster-affected areas to manage hazardous medical waste.</li> <li>- Setting up temporary waste collection points in remote refugee camps.</li> </ul>
<b>Limited resources</b>	Lack of financial resources, materials, and trained personnel to implement effective waste management practices.	<ul style="list-style-type: none"> <li>- Seek partnerships with local NGOs and international organizations.</li> <li>- Train local communities in basic waste management techniques.</li> <li>- Utilize low-cost, low-tech solutions.</li> </ul>	<ul style="list-style-type: none"> <li>- Partnering with local NGOs to manage waste in urban disaster areas.</li> <li>- Training community volunteers to manage waste segregation and disposal in refugee camps.</li> </ul>
<b>Cultural and social barriers</b>	Resistance to adopting new waste management practices due to cultural beliefs or lack of awareness.	<ul style="list-style-type: none"> <li>- Engage in community education and awareness campaigns.</li> <li>- Incorporate local customs into waste management plans.</li> <li>- Involve community leaders in decision-making.</li> </ul>	<ul style="list-style-type: none"> <li>- Conducting waste management workshops that respect local customs and involve community leaders in conflict zones.</li> <li>- Using culturally appropriate messaging to promote recycling.</li> </ul>
<b>Security risks in conflict zones</b>	Difficulty in managing waste in areas where there is ongoing conflict, making it unsafe for waste management teams to operate.	<ul style="list-style-type: none"> <li>- Implement remote waste monitoring and management.</li> <li>- Coordinate with security forces to ensure safe access to waste management sites.</li> <li>- Use mobile units.</li> </ul>	<ul style="list-style-type: none"> <li>- Using remote monitoring technology to oversee waste management in conflict zones.</li> <li>- Deploying mobile waste treatment units in secure locations near conflict zones.</li> </ul>
<b>Environmental hazards</b>	The risk of environmental contamination due to improper waste disposal, particularly of hazardous or medical waste.	<ul style="list-style-type: none"> <li>- Establish specialized disposal facilities for hazardous waste.</li> <li>- Implement strict waste segregation and disposal protocols.</li> <li>- Regular environmental monitoring.</li> </ul>	<ul style="list-style-type: none"> <li>- Creating specialized hazardous waste disposal sites near temporary healthcare facilities.</li> <li>- Implementing strict protocols for medical waste disposal in emergency settings.</li> </ul>
<b>Regulatory compliance</b>	Challenges in adhering to local, national, and international waste management regulations, particularly in rapidly changing emergency contexts.	<ul style="list-style-type: none"> <li>- Conduct regular legal reviews to ensure compliance.</li> <li>- Coordinate with local authorities to align waste management practices with legal requirements.</li> <li>- Adapt protocols to local laws.</li> </ul>	<ul style="list-style-type: none"> <li>- Working closely with local governments to ensure waste management practices in disaster areas comply with national regulations.</li> <li>- Adapting waste protocols to meet local standards.</li> </ul>

<b>Multiple tools and frameworks</b>	Confusion or inefficiency due to the variety of waste management tools and frameworks available, leading to inconsistent application.	<ul style="list-style-type: none"> <li>- Develop clear guidelines on tool selection based on context.</li> <li>- Provide training on the use of various tools.</li> <li>- Simplify toolkits for broader application.</li> </ul>	<ul style="list-style-type: none"> <li>- Providing training on the NEAT+ tool for environmental assessments in humanitarian settings.- Developing simplified guidelines for selecting appropriate waste management tools.</li> </ul>
<b>Climate change impacts</b>	Exacerbates existing waste management challenges by increasing the frequency and severity of natural disasters, leading to higher waste generation and more complex management needs.	<ul style="list-style-type: none"> <li>- Integrate climate-resilient waste management practices.</li> <li>- Plan for increased waste volumes and diverse waste types due to climate-related events.</li> <li>- Enhance infrastructure to withstand extreme weather.</li> </ul>	<ul style="list-style-type: none"> <li>- Developing waste management plans that account for increased waste generation during floods and hurricanes.- Strengthening waste treatment facilities to withstand extreme weather events.</li> </ul>
<b>Coordination among multiple stakeholders</b>	Difficulty in coordinating waste management efforts among various stakeholders, including governments, NGOs, and local communities.	<ul style="list-style-type: none"> <li>- Establish clear roles and responsibilities.</li> <li>- Facilitate regular communication and collaboration among stakeholders.</li> <li>- Use centralized management systems for coordination.</li> </ul>	<ul style="list-style-type: none"> <li>- Setting up coordination committees involving all relevant stakeholders in large refugee camps.- Using digital platforms to share real-time information on waste management activities.</li> </ul>

Table 2: Social impacts of waste management

<b>Challenge</b>	<b>Description</b>	<b>Solutions</b>	<b>Examples/Application</b>
<b>Positive social impacts</b>	Effective waste management can lead to improved public health, job creation, and enhanced community cohesion.	<ul style="list-style-type: none"> <li>- Engage communities in waste management processes.</li> <li>- Promote waste-to-resource initiatives (e.g., recycling, composting) to create livelihoods.</li> <li>- Ensure equitable access to waste management services.</li> </ul>	<ul style="list-style-type: none"> <li>- Creating employment opportunities through community-based recycling programs in refugee camps.- Improving public health by reducing disease vectors through better waste management.</li> </ul>
<b>Negative social impacts</b>	Poorly managed waste can lead to social tensions, health hazards, and marginalization of vulnerable groups.	<ul style="list-style-type: none"> <li>- Implement culturally appropriate waste management practices.</li> <li>- Involve community leaders in decision-making.</li> <li>- Ensure that waste management does not disproportionately affect vulnerable groups.</li> </ul>	<ul style="list-style-type: none"> <li>- Addressing community concerns about waste disposal locations that may negatively impact marginalized groups.- Implementing waste management practices that are sensitive to local customs and reduce social tensions.</li> </ul>
<b>Community engagement and participation</b>	Lack of community involvement can lead to the failure of waste management initiatives.	<ul style="list-style-type: none"> <li>- Conduct regular community consultations and participatory planning.</li> <li>- Develop culturally relevant educational campaigns on waste management.</li> <li>- Encourage community ownership of waste management systems.</li> </ul>	<ul style="list-style-type: none"> <li>- Involving local communities in the design and implementation of waste management strategies in disaster-affected areas.- Running awareness campaigns that educate communities on the benefits of proper waste management and how they can contribute to it.</li> </ul>

## Section 4: Case studies and best practices

### Key points

- Present relevant case studies that illustrate successful sustainable resource and waste management practices.
- Highlight lessons learned and best practices from these case studies.
- Provide real-world examples to reinforce the concepts discussed in previous sections.

### Background information

Case studies offer concrete examples of the challenges and solutions related to sustainable resource and waste management in humanitarian contexts. By examining these real-world instances, participants can gain insights into effective strategies and practices that have been successfully implemented in various settings.



### Content development: Case studies and best practices

Case Study	Context	Environmental Challenge	Humanitarian Response	Lessons Learned
<b>Upcycling in Cox's Bazar</b>	Large influx of Rohingya refugees.	Managing large volumes of waste generated in refugee camps and providing sustainable employment opportunities.	World Food Programme set up an upcycling center to transform packaging waste into useful products like bags, wallets, and mats; cleared 80km of canals to prevent flood risks during monsoon.	Upcycling waste prevents environmental pollution, promotes sustainability, and empowers women in the community by providing work opportunities.
<b>Managing packaging waste sustainably in humanitarian operations</b>	Humanitarian and Stabilisation Operations Team (HSOT), UK	The widespread use of single-use plastic packaging in humanitarian aid deliveries led to significant environmental issues, including pollution from open-air burning and uncontrolled disposal in recipient communities.	HSOT, managed by Palladium, implemented a three-fold approach: eliminating single-use plastic packaging where possible, replacing plastic packaging with more sustainable options, and ensuring that residual plastic packaging is essential, 100% recycled, and 100% recyclable.	Collaboration with suppliers is critical; regular inspections ensure compliance with environmental standards; utilizing existing legislation like the UK's Plastic Packaging Tax helps influence suppliers to adopt sustainable practices.

<p><b>ACTED Lebanon: A holistic approach to reducing and managing waste</b></p>	<p>Response to Lebanon's waste crisis and ongoing environmental challenges</p>	<p>Low in-country waste management capacity and high carbon footprint associated with humanitarian operations</p>	<p>ACTED Lebanon introduced sustainable procurement practices, banned single-use plastics in the office, launched waste segregation and recycling initiatives, and influenced suppliers to adopt sustainable practices. Training on waste management was conducted, and packaging was optimized to reduce waste.</p>	<p>Organizational change towards sustainability requires leadership, staff buy-in, and strategic supplier partnerships. Small, incremental changes can lead to significant environmental impact reduction. Financial costs must be anticipated, but the long-term environmental benefits outweigh these.</p>
<p><b>Sustainable waste management in logistics</b></p>	<p>IFRC's humanitarian logistics operations</p>	<p>Excessive waste generation, particularly from packaging, in humanitarian logistics, leading to environmental pollution and challenges in waste management at distribution sites.</p>	<p>IFRC, along with partners, implemented strategies such as removing single-use plastics, using sustainable materials like cardboard instead of plastic, and encouraging greener supplier practices.</p>	<p>Transitioning to sustainable packaging reduces environmental impact, improves waste management at distribution points, and can lead to cost savings. Collaboration with suppliers and adopting a holistic approach to supply chain management is crucial in achieving these outcomes.</p>
<p><b>Compost Toilets in Refugee Camps</b></p>	<p>Refugee camps in Kenya (Kakuma) and Uganda (Nakivale)</p>	<p>Poor sanitation, soil degradation, and lack of sustainable waste management solutions in refugee settings.</p>	<p>In Kakuma, Farming and Health Education (FHE) implemented Treebog compost toilets, utilizing fast-growing trees to aid composting and improve soil health. In Nakivale, Youth Initiative for Community Empowerment (YICE) built urine-diverting EcoSan toilets, providing safe waste disposal and compost for gardens.</p>	<p>Compost toilets can offer sustainable sanitation solutions that enhance food security and environmental health. Community involvement and education are key to acceptance and long-term use. Integrating sanitation with agriculture improves both sanitation and food production.</p>

## Further resources for case studies:

- Groupe URD Module on Waste Management: <https://www.urd.org/en/news/e-learning-modules-on-environmental-issues-new-on-our-e-learning-platform/>
- Joint Initiative solutions and case studies: <https://eectre.org/2019/07/15/https-www-eectre-org-2019-07-15-sustainable-humanitarian-packaging-waste-management/>
- UNEP/OCHA JEU training on Disaster Waste Management: <https://eectre.org/training/>



# ACTIVITIES

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## 1. Interactive exercise: identifying waste types

- Participants will work in small groups to classify different types of waste using provided examples
- **Discussion points:** *What are the different types of waste generated in humanitarian contexts? What are the impacts of each type on the environment and health?*

## 2. Brainstorming session: waste reduction techniques

- Participants will brainstorm and share techniques for reducing waste in humanitarian operations.
- **Discussion points:** *What practical methods can be implemented to reduce waste generation at the source? What challenges might arise in implementing these methods?*

## 3. Case study analysis: sustainable waste management

- Participants will analyze a provided case study on sustainable waste management practices.
- **Discussion Points:** *What key concepts and principles were used in the case study? How did the sustainable waste management practices influence the project outcomes?*

## 4. Interactive exercise: identifying pollution sources

- Participants will identify potential sources of pollution in humanitarian settings and suggest control measures for each source.
- **Discussion points:** *What are the common sources of pollution in humanitarian contexts? What strategies can be employed to control these pollution sources effectively?*

## 5. Practical exercise: implementing water conservation techniques

- Participants will demonstrate and discuss various water conservation techniques.
- **Discussion points:** *How can water conservation techniques be implemented in different humanitarian scenarios? What are the benefits and potential challenges of these techniques?*

## 6. Discussion: developing pollution control measures

- Facilitated discussion on developing effective pollution control measures.
- **Discussion points:** *How can pollution control measures be designed to be both effective and practical? What challenges might arise in implementing these measures?*

## 7. Role-playing: emergency waste management planning

- Participants will engage in role-playing exercises to plan and implement emergency waste management strategies in hypothetical disaster scenarios.
- **Scenario Example:** *Planning a waste management strategy for a newly established refugee camp – participants will decide on methods for waste reduction, recycling, and safe disposal.*

## 8. Case study analysis

- Participants will analyze a provided case study (e.g., water management in Afghanistan) and discuss lessons learned and best practices.
- **Discussion Points:** *What were the key environmental challenges? How did the humanitarian response address these challenges? What lessons can be learned from this case study?*



# RESOURCES

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## Materials

- Projector and screen
- Laptops/tablets (for participants)
- Flipcharts and markers
- Printed handouts of case studies
- NEAT+ tool (if available)
- Access to waste management software/tools e.g. WREC Map of solid waste management facilities <https://logie.logcluster.org/?op=wre>

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## Delivery method

- **Presentation:** Facilitators will introduce key concepts and principles using slides and handouts.
- **Plenary discussion:** Participants will engage in whole-group discussions to explore and clarify key points.

- **Group work:** Participants will collaborate in groups to apply concepts to real-world scenarios, encouraging teamwork and deeper understanding.
- **Practical exercises:** Hands-on activities will enable participants to practice designing and implementing waste management strategies.

## Assessment tools

- **Participation in discussions:** Active participation during plenary discussions will be observed and assessed.
- **Group work presentations:** The quality and relevance of the group presentations will be evaluated based on how well participants apply the concepts learned in the module.
- **Q&A sessions:** Participants' understanding will be gauged through their responses during Q&A sessions.
- **Practical exercises:** The effectiveness of practical exercises will be assessed based on the participants' ability to design viable waste management strategies.

## Reflection and review questions

### Section 1: Introduction to waste management

- What are the different types of waste generated in humanitarian settings?
- Why is waste management important in emergencies?
- What are the key principles of sustainable waste management?

### Section 2: Practical approaches to waste management

- What are the key steps in designing waste management systems in humanitarian contexts?
- How can innovative solutions and technologies improve waste management practices?
- What are some practical examples of waste management in different humanitarian contexts?

### Section 3: Challenges in waste management

- What are the main challenges in waste management during humanitarian interventions?
- How can these challenges be effectively addressed?
- What are the social impacts of waste management, both positive and negative?

### Final reflection questions

- How can waste management practices be integrated into broader humanitarian action plans?
- What are the key lessons learned from the case studies and examples provided?
- How can communities be effectively engaged in sustainable waste management practices?

# KEY TAKEAWAYS

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## 1. **Significance of sustainable waste management in humanitarian contexts:**

Environmental screening provides a rapid assessment of potential environmental risks in humanitarian interventions, allowing for quick decision-making and timely mitigation measures. This process is crucial in resource-limited settings to prevent unintended environmental damage and promote sustainable humanitarian responses.

## 2. **Principles of sustainable waste management:**

Key principles such as waste reduction, segregation, reusing, recycling, and safe disposal are fundamental to reducing the environmental footprint of humanitarian operations. These practices ensure that waste is managed responsibly, promoting resource efficiency, and protecting public health.

## 3. **Innovative solutions and technologies:**

Innovative waste management solutions, such as eco-bricks, biogas systems, and mobile waste treatment units, provide practical approaches to managing waste in resource-constrained settings. These technologies not only address immediate waste challenges but also contribute to long-term sustainability by reducing reliance on traditional, less environmentally friendly methods.

## 4. **Community engagement and participation:**

Engaging communities in waste management is essential for successful and sustainable outcomes. Involving local populations in decision-making, raising awareness through education, and aligning waste management practices with cultural and social norms enhance community acceptance and ownership of waste management systems.

## 5. **Challenges and strategic solutions:**

Waste management in humanitarian settings often faces challenges such as logistical constraints, limited resources, and security risks in conflict zones. Addressing these challenges requires a combination of innovative solutions, strong coordination among stakeholders, and flexible, context-specific approaches that can adapt to changing conditions.

## 6. **Health and environmental benefits:**

Proper waste management prevents the spread of diseases, reduces environmental pollution, and supports overall community well-being. Sustainable practices, such as composting organic waste and treating hazardous waste appropriately, protect both human health and local ecosystems, contributing to the resilience of affected communities.

## 7. **Practical approaches in diverse humanitarian contexts:**

Effective waste management strategies must be tailored to specific humanitarian scenarios, such as refugee camps, urban disaster areas, and remote rural locations. Adapting waste management practices to local conditions, available resources, and community needs ensures that interventions are both effective and sustainable.

## 8. **Case studies and best practices:**

Analyzing case studies provides valuable insights into successful waste management strategies. Examples like faecal sludge management in Bangladesh and upcycling projects in Cox's Bazar demonstrate the importance of innovative solutions, community involvement, and strong coordination in achieving positive outcomes.

## 9. **Integration into broader humanitarian planning:**

Waste management should not be treated as an isolated task but integrated into overall humanitarian action plans. This approach ensures that waste management goals align with other interventions, such as health, WASH, and shelter, creating a cohesive response that maximizes resource efficiency and minimizes environmental impact.



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