HURRICANE RESPONSE ENVIRONMENTAL ISSUES OVERVIEW

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Environmental Community of Practice

Background

The 2024 Hurricane season is expected to be very active in the Caribbean Basin. This note summarizes significant environmental issues which should be considered in the humanitarian response and transition to recovery. A set of key resources are also included.

The Overview is based on a shelter-and-settlements approach, wherein the overall settlement affected by a hurricane is the basis for the response to shelter and other needs. The content for this Overview incorporates similar information developed for Tropical Storm Grace and Hurricanes Eta and Iota.

Environmental Issues – Immediate Response

Debris (Recycle, Reuse and Repurpose): Hurricanes and tropical storms are likely to generate significant volumes of organic debris, including from wind-damage to vegetation and from flooding. Clearing this debris is a first-order task in reestablishing access, shelter, commercial activities and food production. This debris should be considered as an asset for recovery and reconstruction.

Debris management should follow the guidance set out in the Disaster Waste Management Guidelines. Where possible, debris should be reused or repurposed to support the recovery process (e.g., damaged trees processed into timber for use in rebuilding) or recycled through, for instance, composting, to improve soil quality and crop production. The Pan American Health Organization 2023 guidance *Solid waste management in disaster situations*[2], addresses regional experience over the past few decades.

Hazardous Chemicals: Improper hazardous chemical disposal could increase the risk of groundwater pollution. Household and commercial buildings likely contained varying quantities of hazardous chemicals (e.g., clearers, pesticides, paints, etc.) which need special handling when removed. Debris management teams need to be trained in safe removal requirements and plans made for the safe processing and disposal of hazardous chemicals.

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[2] CEPIS-PAHO, 2003. *Solid waste management in disaster situations.*

The requirement for safe management of hazardous chemicals also applies to industrial sites, which may contain significant quantities of hazardous chemicals and pre- or post storm contaminated buildings and ground. The Flash Environmental Assessment Tool (FEAT) should be used to assess the scope and scale of any reported release of hazardous chemicals.

Asbestos: Although the extent of asbestos use is not known for each country in the region, it should be assumed to be present in roofing and construction as it less prone to degradation in tropical conditions. A step in dealing with disaster debris and repairing damaged buildings, is to assess the presence of asbestos, in general and in the debris. Where asbestos may be present or is in the disaster debris current good practices should be followed.[3]

Agriculture Pesticides: Particularly in the agriculture-export focused areas it is likely that flooding has affected on-farm, point-of-sale, and wholesale stocks of pesticides. These sources of environmental pollution and human health threat need to be assessed and remediated with appropriately trained and equipped teams.

Vector Control: Malaria, Dengue and other vector-borne diseases are endemic across the hurricane-affected countries. Vector control efforts may need to increase given the potential for newly created vector habitat. While chemical control may be necessary as an emergency measure, vector control should shift to an integrated pest management approach as quickly as possible. See **Reducing Environmental Impacts of Vector Control Chemicals in Emergencies**[4] for operational guidance.

Water and Sanitation: Rainfall, flooding and landslides are likely to triggered by the passage of a hurricane or a tropical storm. These events can have significant impacts on water supplies, including damage to storage and distribution systems, contaminating water and blocking springs and other sources. These events also likely damaged sanitation systems, including filling wastewater holding tanks.

Restoring water supplies, and ensuring adequate treatment of water, are clear priorities from disease prevention and hygiene perspectives. However, where water supplies repairs may need to be temporary this work should consider the potential for further flooding or landslides to avoid having to make additional near-term repairs.

[3] See https://www.humanitarianlibrary.org/resource/brief-guide-asbestos-emergencies-safer-handling-breaking-cycle-0 and Disaster Waste Management Guidelines.
[4] https://ehaconnect.org/wp-content/uploads/sites/2/2019/05/Reducing-Environmental-Impacts-Of-Vector-Control-Chemicals-In-Emergencies-2019.pdf

Repairs to wastewater systems should consider further flooding or landslides and undertake work in a way which reduces the need for repeated repairs. Emptying wastewater holding tanks needs to safely dispose of the effluent to avoid the contamination of water courses used for human water supplies or irrigation and avoid damage to land and sea habitat needed for human food security and livelihood activities.

Food Security: Hurricanes and tropical storms can be expected to damage food and cash crops, fisheries and aquaculture habitat and gear, including for local consumption or export. This damage is likely to put immediate pressure on rural and some urban residents to find alternative sources of food and income (to cover basic needs).

In turn, these efforts may put pressure on natural resources, particularly near cities and towns. While the provision of food and cash support can reduce this pressure to some degree, support will need to continue for up to six months to provide sufficient time for crops to be harvested. Cutting this support off quickly can be expected to increase uncontrolled natural resource harvesting.

Housing and Shelter: Damage to housing contributes to four environmental issues:

1. Emergency shelter is usually in the form of plastic sheets, with some associated non-food-items. Disaster survivors then need to secure poles to hold up the plastic and find other resources to assure adequate shelter. Securing poles and, for instance, fire wood, in urban areas may difficult and create a commercial demand for scarce resources from rural locations. In rural areas, the commercial availability of non-food items to replace items lost during the disaster may be limited, leading to an increase in prices, and increased pressure on natural resources, to meet demands or to generate income to purchase needs. An assessment of the total economic impact of shelter assistance should be used to identify possible environmental impacts linked to the provision, or lack of provision, of shelter materials and non-food items.
2. Flood-damaged housing will generally contain a range of debris which requires environmentally sound disposal. This debris will likely include stoves, refrigerators and electrical equipment, all of which require well planned disposal programs incorporating recycling and reuse.
3. Replacing lost or damaged housing units will require extracting natural resources at considerably greater levels than under normal conditions, risking damage to the environment from overexploitation.
4. It is unlikely that most of the damage or destroyed housing units will be repaired or rebuilt in less than 12 months, leading to a need for transitional shelter arrangements, including camps, but also arrangements where the affected live near or next to their home while it is being repaired. These transitional shelter arrangements need to be planned so they are in locations as safe as possible from flooding as they will continue to be exist through the next hurricane season, if not longer. Transitional shelter planning needs include the provision of services such as water and sanitation, schooling, health care, markets and shelter-based economic activities

to ensure that rebuilding process placed as limited as possible demand on neighboring natural resources.[5]

Environmental Reviews

Sphere Shelter Standard 7 and generally good practice indicate that environmental reviews should be part of humanitarian planning and operations. There are a number of tools which can be used for an environmental review, including NEAT+ and the Rapid Environmental Assessment process. Government and funding agency regulations may require some form of environmental review, particularly in the transition from short term relief to longer term recovery. Environmental reviews provide a critical check on humanitarian operations to ensure they do not cause immediate or long-term harm and are a practical application of the *do no harm* principle.

Recovery and Rebuilding

Resource Extraction and Strategic Impact Assessments: Rebuilding buildings, roads, bridges and other infrastructure will lead to a significant short-term increase in demand for natural resources such as sand, gravel and soil, as will increased demand for cement, roofing and wood. These demands should be quantified based on overall estimates and plans established to not over-exploit sources nearest construction sites. To this end, strategic impact assessments[6] should be developed as part of recovery plans to define how to best meet short term natural and other rebuilding resource needs while minimizing and mitigating negative environmental impacts. In addition, The Green Recovery and Reconstruction Training Toolkit should be used as a guide on the environmental aspects of rebuilding.

Housing Site Selection: The selection of transitional and new settlements sites should consider flooding risks as well as lessons gained through recovery from past floods. This includes not only Hurricane Mitch (1998), but also Hurricane Fifi (1974) in Honduras and other disasters in Central America.

[5] The Programmatic Environmental Impact Assessment for the IOM Temporary Relocation Program In Haiti (https://www.dropbox.com/scl/fi/witqzzih4agmdgrbr5a6x/Temp-Relocation-PEA-Haiti-29-Dec-2010-Final.pdf?rlkey=nimhzxhcvkhlbkh23vzro3shp&dl=0).
[6] https://www.ucl.ac.uk/hazard-centre/sites/hazard-centre/files/wp29.pdf.

Flood Risk Management: The recurrent threat from flooding needs to be incorporated into recovery planning, in line with the concept that recovery should include reducing the risk of future disasters. The Flood Green Guide should be used as a core part of this process.

Resources

Environment and Disaster Management @ WWF - http://envirodm.org/about. The WWF Environment and Disaster Management team are available to respond to requests for information or guidance on the environment and the response to disasters.

EHA Connect - Connecting Environment and Humanitarian Action - https://ehaconnect.org/

Parks and Protected Areas: An initial list of park and other environmental reserves for the Caribbean region can be found at Parks.It - https://www.parks.it/america/Eindex.html.

Reducing environmental impact in humanitarian response - https://www.eecentre.org/wp-content/uploads/2019/12/thematic-sheet-environment-EN.pdf.

Virtual Environmental and Humanitarian Adviser (VEHA) tool "designed as an online resource for practitioners and professionals working in the response, planning and management teams" - https://ehaconnect.org/veha-tool/

Honduras: Perfil ambiental de país para la respuesta de alojamiento - https://sheltercluster.org/environment-community-practice/documents/honduras-perfil-ambiental-de-pais-para-la-respuesta-de