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## BANGLADESH



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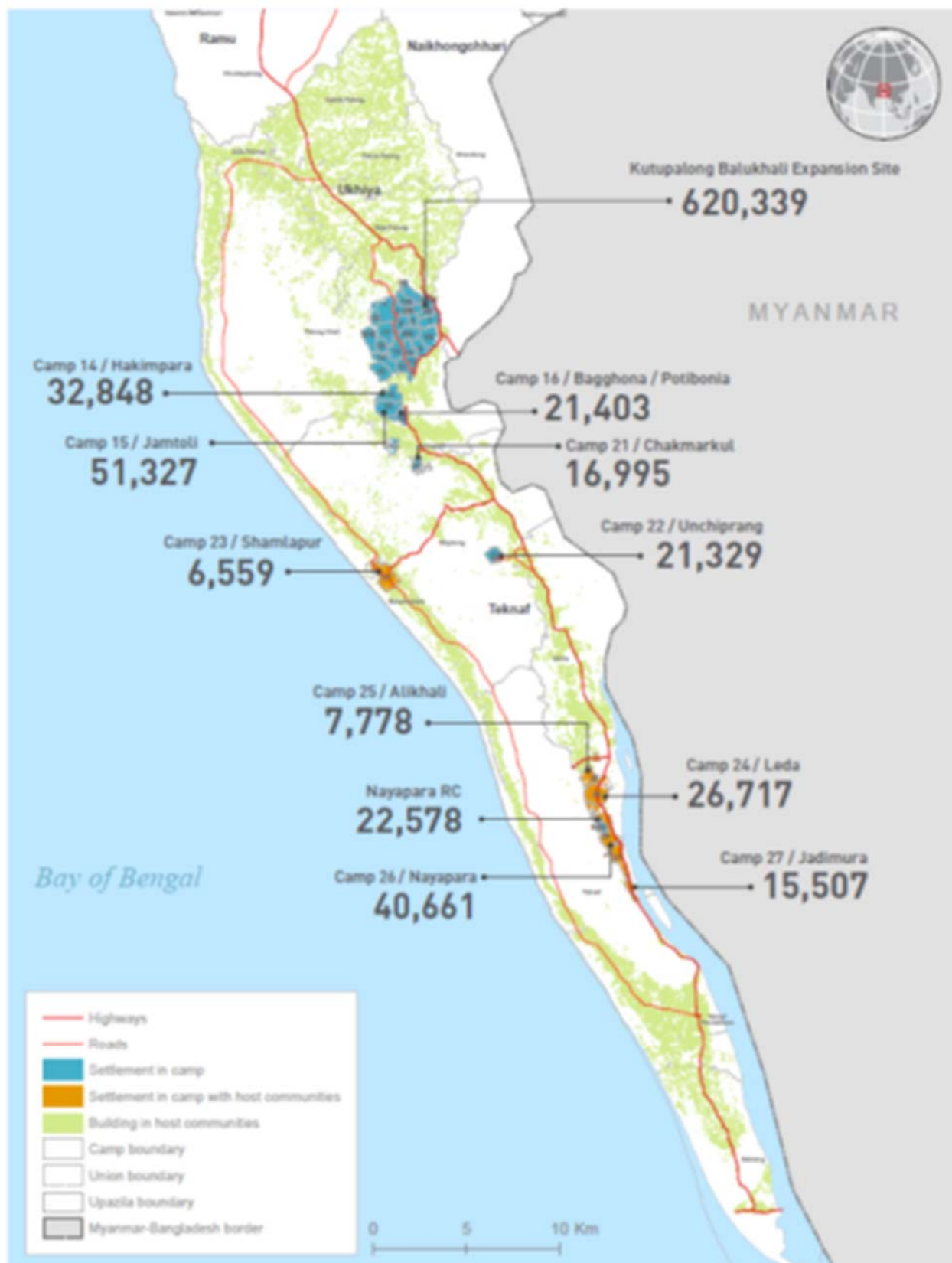
### Disaster waste (debris) management contingency plan

June – July 2021

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**DATE:** JULY 17, 2021

**MISSION REPORT V1.1**

**BANGLADESH: COX'S BAZAR REFUGEE POPULATION AS OF 31 MARCH 2021**



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## 1 FOREWORD

### What means Debris or Disaster Waste?<sup>1</sup>

All waste generated following a natural disaster such as tropical cyclones, monsoon, fire, etc. These may include:

- **Household waste** - general household trash and personal belongings scattered during a disaster;
- **Construction debris** - building materials, drywall, timber, roofing iron, furniture, mattresses, etc.;
- **Organic debris** - trees, branches, shrubs, logs, and leaves.
- **Hazardous waste** – batteries, medical waste.;
- **Recyclable waste** – bamboo sticks, plastic sheeting, metal, plastic bottles, etc.;

### What does the Management of Disaster Debris involve?

Effective management of debris following a disaster can be difficult but is necessary.

Activities a community may undertake includes:

- **Estimating** the amount of debris;
- **Assessing** debris management options;
- **Separating** debris into different material and waste streams;
- **Identifying debris management sites** and facilities and their available capacities;
- **Collecting and moving** debris;
- **Removing debris from rivers**, drainages and sensitive habitats;
- **Identifying hazardous waste**, for proper management;
- **Packaging and labelling debris for transport**; and transporting debris to management sites and facilities.

All this can take a long time. But the faster the above and related tasks can be effectively done, the faster the community can return to normal operation.

Moreover, the longer it takes to remove debris, the higher the risks of personal injury and health risks to the community and the environment.

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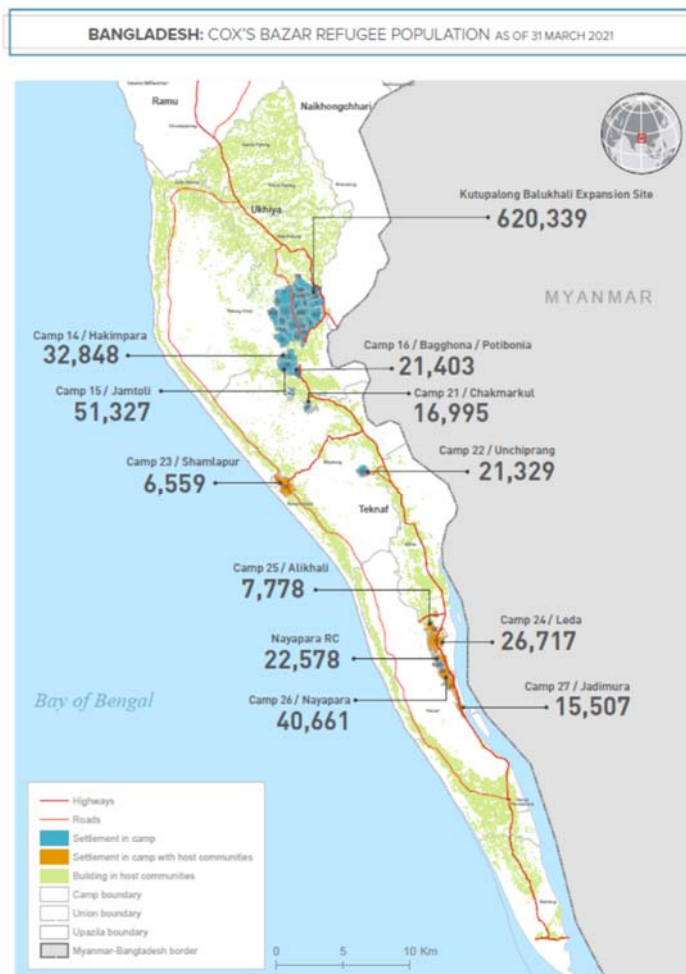
<sup>1</sup> Managing Disaster Waste: A Guide for Communities SPREP – EU August 2020

## 2 GENERAL CONTEXT <sup>2</sup>

Given the scale, and rate of arrival of the August 2017 refugee influx from Myanmar into Bangladesh, the Rohingya settlements were predominantly self-settled, with no pre-emptive site planning. Consequently, the sites which are spread over hilly terrain with soft soil—are opportunist, organic in design and congested.

The yearly monsoon, frequent cyclones that form in the adjacent Bay of Bengal and other hazards pose threat to the entire region, including the refugees, their settlements and its fragile but vital infrastructure.

As of April 2021, more than 884,000 refugees lived in 34 camps in Cox’s Bazar district.



**Map 2.1:** Location of camps and number of refugees March 2021 in Cox’s Bazar district

Some 81% of the refugees arrived after the 25<sup>th</sup> of August 2017, following an outbreak of violence in Myanmar’s Rakhine State.

All camps are threatened by the impact of monsoons and cyclones.

There is limited viable or practical physical protection solutions or agreed planning that would enable an evacuation of the camp population to safer areas before, during, or after any major disaster.

Emergency preparedness is a priority for all humanitarian actors in Cox’s Bazar refugee camps, to support Bangladesh and refugees in mitigating risks associated with extreme natural events.

UNHCR and its partners, in addition to, and in parallel with, ongoing contingency planning, continue to promote concrete

and innovative protection-sensitive preparedness activities to raise awareness about the risks of natural and manmade disasters, particularly in areas where refugees are unable to relocate to safer areas.

Notably, UNHCR and its partners continue providing training to refugee volunteers, strengthening essential infrastructure, and prepositioning relief items and equipment in the camps or in proximity.

Concurrently, UNHCR is collaborating with the Government of Bangladesh, and other UN agencies and partners, in line with a “One-Camp approach” and contributing to the Refugee Site Monsoon Preparedness and Cyclone Operational Plan (RSMPCOP) led by

<sup>2</sup> Rohingya refugee response – Bangladesh - Emergency preparedness & response – Action plan UNHCR 2021

the Inter-Sector Coordination Group's (ISCG) Emergency Preparedness Working Group (EPWG).

Most significantly, the 2021 plan aims to enhance the capacities of refugee communities to respond in the event of major incidents, which it is expected they will do effectively as they are already at the centre of the response.

Building on the refugees' own capacities to prepare and respond to disaster is considered critical. These efforts play a key role, alongside the Host Community solidarity Project that are designed to build on local capacities to support any response delivered within host communities.

Year after year, refugees played a more active role in the response, broadening their work to identify incidents and coordinate with humanitarian actors on the response, to ensure the safety of those within the camps. UNHCR and partners focused on responding to larger scale incidents and coordination, while refugees dealt with minor incidents.

With the foundations of the 2018, 2019 and 2020 emergency response in place, the 2021 plan is based on a community-centred approach, with particular focus on enhancing existing capacity. The ongoing support from UNHCR and its partners remains, but the response is more rooted in refugee community's own capacities, resilience, and its ability to act as first responder across sectors.

This model rests largely on trained multi-sector refugee volunteer groups acting as first responders in the camps, which sees refugees lead in the frontline awareness-raising, reporting, and response, coupled with simultaneous support to host communities living in close proximity to the camps by humanitarian agencies.

These efforts collectively supported by the interagency coordination through the ISCG's EPWG and UNHCR's Emergency Response Teams (ERTs) that will stand ready for rapid field deployment when needed in extreme weather emergencies, and to aid in post-disaster assessments and recovery.

A closer coordination with the Bangladesh Armed Forces in matters of disaster response in the refugee settlements is needed and conversations have already taken place.

The "One Camp" approach that underpins the collective humanitarian response in Cox's Bazar camps is one that considers needs of all camps, rather than on an agency's Area of Responsibility (AoR) approach, and this should continue to drive coordination decisions.

Rohingya refugees continue to demonstrate a high level of resilience and adaptability. The 2020 preparedness plan builds on the increased technical and knowledge capacity of refugees established over the last two years. The refugee community is already at the centre of the response, with proven capacity demonstrated on numerous occasions.

This capacity is rooted in existing community-based protection and empowerment models already in place, which ensure the experience, concerns, and needs of all refugee groups - men and women of all ages and abilities - are taken into consideration. For 2021, UNHCR continues to enhance the capacity of the refugee community through the provision of additional training to impart practical knowledge and skills related to specific emergency preparedness and response activities.

Building on the last three year's experiences and through ongoing training, community responders have been now assigned specific tasks namely Preparedness, Early Warning, First Responders, and Rapid Damage Assessments.

Each role has the support of a corresponding unit within UNHCR, and a dedicated partner agency prepares community members through rolled-out training. The above tasks are also further sub-divided into a protection-focused role and more technically



focused roles, with the different groups working together in a harmonized manner to better serve the community in respect of potential hazards.

### 3 LEGAL REFUGEES' CONTEXT

Bangladesh is not a signatory to the 1951 Convention relating to the Status of Refugees or its 1967 Protocol (the "Refugee Convention") and there is no national law regulating refugee matters in Bangladesh.

While the Government of Bangladesh has ratified a number of international human rights treaties under which the Government has an obligation to respect and fulfil those rights, such international obligations are not always implemented in the national courts unless a national law has been enacted.

The actual treatment of the refugees is often determined by Government directives and/or subject to inconsistent interpretation and application of the laws. Moreover, refugees' enjoyment of their socio-economic rights is severely restricted. The lack of formal legal status leaves Rohingya refugees in a precarious situation, particularly with respect to their enjoyment of basic rights.

In terms of coordinating efforts relating to the situation of Rohingya refugees in Bangladesh, the Government has put in place coordination and implementation mechanisms. The inter-ministerial National Task Force (NTF) chaired by the Ministry of Foreign Affairs is responsible for providing overall strategic and policy coordination on refugee matters.

The Ministry of Disaster Management and Relief manages the operational response through the Refugee Relief and Repatriation Commissioner (RRRC) based in Cox's Bazar. In early 2021, a new committee in charge of security, law and order was established and is chaired by the Ministry of Home Affairs.

## Coordination architecture for the Rohingya humanitarian crisis

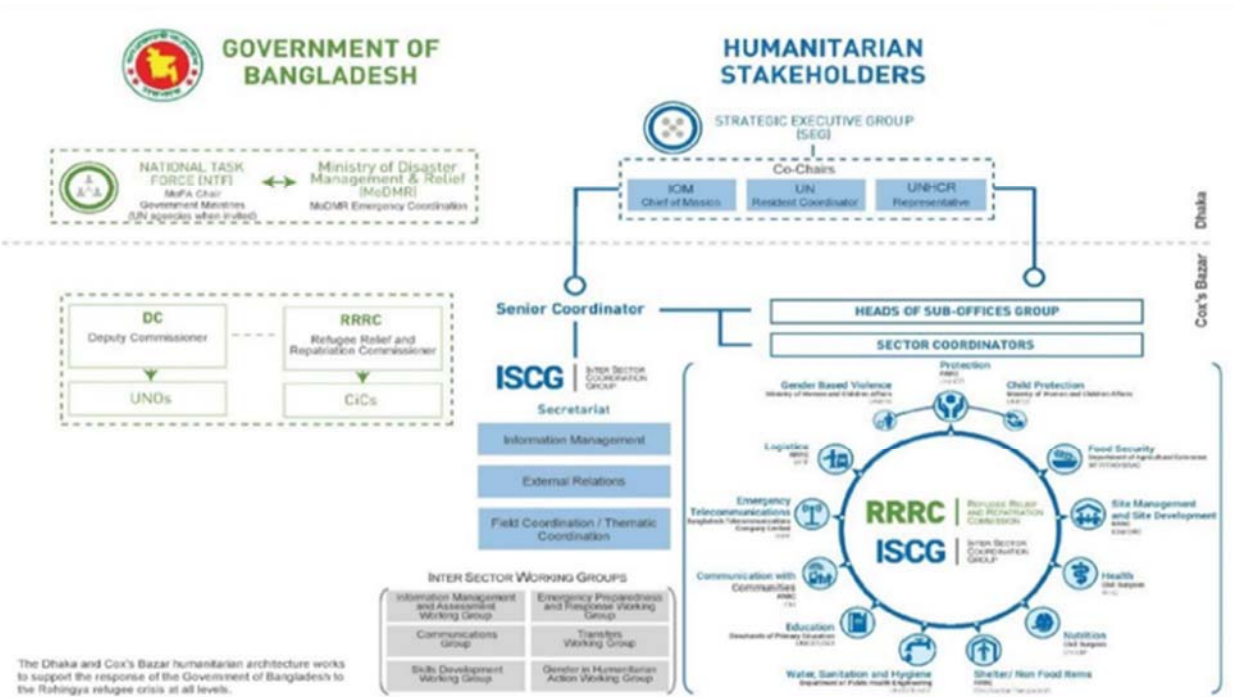


Figure 3.1: The Current Coordination Structure in dealing with Rohingya Refugee Situations in Bangladesh, as per January 2021 (to be found at a larger scale in the annexes)



## **4 DISASTER MANAGEMENT AT THE COUNTRY LEVEL**

Bangladesh is susceptible to a variety of disasters including cyclones, earthquakes, droughts, storm-surge and flooding. In addition, the country encounters other manmade hazards such as fires and infrastructure collapses. Bangladesh is also vulnerable to climate change due to its location in South Asia.

The government has made progress in preparing for much of these disasters through plans and policies by gradually shifting their disaster management approach to a comprehensive risk reduction methodology based on common disaster experiences, lessons learned, and the desire to reduce future impacts.

The country has a well-established community preparedness capability due to the implementation of comprehensive education and training programs by government agencies and non-governmental organisations. Disaster management committees have been established and trained at all administrative levels. These committees and volunteers communicate disaster alerts and evacuation instructions to coastal residents and assist with coordinating relief supplies<sup>3</sup>.

## **5 EMERGENCY RESPONSE AND PREPAREDNESS IN THE REFUGEE CAMPS**

Rohingya refugees are sheltered in camps and in surrounding host community areas. Shelters, overcrowding, limited resources and a lack of options for evacuation in the event of disaster make the Rohingya particularly vulnerable to natural disasters, and also increases the vulnerability of host communities.

In support of the Government of Bangladesh, the humanitarian community in Cox's Bazar has been engaging in preparedness for possible extreme weather affecting the camps and host communities.

A cyclone contingency plan has been in place since 2018 in Cox's Bazar and, in April 2019, a 72-hour response plan was developed in cooperation with local authorities in the upazilas of Ukhia and Teknaf (camps areas) detailing the priorities for the immediate emergency response. The plan specifies the approach to coordination, communications and access, details the minimum assistance package and includes a distribution plan.

Distribution points covering defined catchment areas have been selected, with stock prepositioned inside and near to the camps to ensure immediate supply.

After Cyclone Bulbul in November 2019, humanitarian actors carried out a lessons-learned exercise to examine the effectiveness of their preparedness and response actions.

The 72-hour response plan is being updated to fine-tune preparedness measures and reflect the findings of the lessons-learned exercise. For example, coordination between different sectors and agencies is being streamlined to ensure maximum efficiency and avoid confusion in the immediate aftermath of cyclone landfall.

### **5.1 Site management and site development (SMSD)**

The SMSD Sector, through its site management agencies, plays a key coordination role at camp level. Each camp has a Disaster Management Committee that is responsible

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<sup>3</sup> Bangladesh Disaster management reference handbook. Centre for Excellence in Disaster Management & Humanitarian Assistance 2020

for overall coordination of monsoon preparedness (which could also be activated in the event of other emergencies). The Disaster Management Committee is made up of:

- Camp Manager,
- Camp in charge (CiC),
- Assistant CiCs,
- Focal points from various key sectors (WASH, Shelter, Health, Protection, Food and SMS),
- Disaster Management Unit Representative
- Site Development Focal Point.

Preparedness activities are focusing on capacity building for both Rohingya and host community volunteers, monsoon drills, sensitization and awareness raising (including in host communities in the immediate vicinity of the camps)<sup>4</sup>

## 6 TRIGGER FOR INITIATING A DEBRIS MANAGEMENT CONTINGENCY PLANNING

A devastating fire broke out in the Kutupalong Balukhali Extension (KBE) on 22 March 2021 at 3pm, starting in camp 8W and spreading through camps 8E and 9, touching camp 10 and damaging some 200 structures in the host community.

The damage caused by the fire significantly sets back the humanitarian response and exacerbates the existing needs of the refugees. While fires in the camps are common, this fire was described as unlike any other fire seen in the camps since 2017.

As of 24<sup>th</sup> of March, out of the 125,000 people living in the four camps, 45,000 are estimated to have been displaced and some 10,000 shelters and 1,600 facilities have been destroyed or damaged.

Rohingya refugee volunteers mobilized immediately to support the community as first responders. Government response services, including the fire brigade and army, also tried to control and put out the fire.



Photo 6.1: Camps aerial picture



Photo 6.2: March 22, camps in fire

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<sup>4</sup> Rohingya refugee response – Bangladesh - Emergency preparedness & response – Action plan UNHCR 2021



**Photo 6.3:** Camp 9 on 29 March 2021 by Mariangela D'ADAMO, WASH Sector



IOM March 2021

**Photo 6.4:** After the fire and debris clean-up IOM

### 6.1 Emergency temporary use of the solid waste facilities

During the fire incident in March 2021, a large amount of burnt debris and other waste were removed from Camp 8W, 9 & 10, and temporarily disposed to empty spaces, existing sorting facilities, etc., to sorted.

To ensure that only non-recyclable waste was disposed to the TSWF, SMEP/IOM/WFP teams cleaning the affected camps set up several segregation points where food waste from the food emergency response, and organic waste and soil (inert) from the drainage systems were segregated and screened before final disposal.

From this exercise, the following quantities have been segregated <sup>5</sup>:

| Type of debris/waste          | Quantity               | Destination   |
|-------------------------------|------------------------|---|
| Soil                          | ~ 70 m <sup>3</sup>    | Recovered to use as construction/restoring material                       |
| Scrap metal, tin, and plastic | 221 Ton                | Directly recovered by the local recycling dealers                         |
| Food waste                    | Not measured           | Transferred to several Material Recovery Facilities (MRF) for composting  |
| Non-recyclable waste          | ~ 3'768 m <sup>3</sup> | Transferred to the TSWF Including the drainage waste from the fire area). |

**Table 6.1.1:** Debris resulting from the March 22, 2021 incident

Most of the fire waste debris was removed during the first week. By that time, the teams in the camps started cleaning the drainage systems and set up sorting points in the affected camps and outside in a land adjacent to the TSWF in Camp 20 Ext. Consequently, the operation was extended and slowed down due to the need to

<sup>5</sup> Temporary Solid Waste Facility Camp 20ext UNDP May 2021

segregate the waste, which guaranteed the avoidance of organic waste and soil (inert) being disposed at the TSWF.

## 6.2 Challenge

During the fire response emergency

- Over the first weeks after the incident, organic waste from the emergency food distribution & drainage waste was mixed-up with residual waste at the TSWF.
- Proper compactor and dozing equipment and additional CfW were required to properly manage the waste reaching the TSWF (spread, cover by soil and compact the waste daily) which ranged from 10 to 50 trips per day.
- Hazardous waste like burnt animal bodies, oil, grease, chemicals, medicine etc. generated in emergencies such as fire or other natural/man-made disasters could hamper the waste management response at the TSWF if no contingency plans or guidelines are established in advance.

## 6.3 Lessons learned

- Proper communication with the teams cleaning the affected camps and the personnel at the TSWF needs to be established during emergency.
- Temporary segregation areas are needed during any emergency to ensure that non-organic, soil (inert) or recyclable waste are sent to the TSWF.
- Food wastes can be handled to camp MRFs which have composting facilities.
- Due to the type of construction material, the production of debris, referred to shelter square meter is of 0.025 m<sup>3</sup> of debris per square meter or < ~10 kg/m<sup>2</sup>.<sup>6</sup>
- Extra support of CFW, truck, compactor, dozer must be provided in the event of fire or another emergency that requires a massive use of the TSWF.

## 7 NATIONAL BANGLADESH INSTITUTIONAL FRAMEWORK FOR DEBRIS MANAGEMENT

Institutional Mechanism of Disaster Management Scenarios of Bangladesh

The Government of the People's Republic of Bangladesh has developed and implemented a disaster management approach focussed on the following three key documents determining the process for post-disaster management, wherein debris management is included:

- a. Disaster Management Act** of 2012;
- b. Standing Orders on Disaster**, as issued by the Ministry of Food and Disaster Management, Disaster Management & Relief Division and Disaster Management Bureau (dated 06 April 2010);
- c. National Plan for Disaster Management** 2010-2015, as issued by the Disaster Management Bureau, Disaster Management & Relief Division (dated: April 2010).

Within these three documents, Disaster Management for Bangladesh are centred around 4 situations:

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<sup>6</sup> Use of the Temporary Solid Waste Facility Camp 20ext (TSWF) May 2021

- Normal time;
- Alert and Early Warning time;
- Emergency Response;
- Recovery Stage.

Within these situations, Debris Management is currently not explicitly addressed, however the Bangladesh Incident Management Systems (BIMS) has drafted an organigram to address emergency debris issues for saving lives in post-disaster events.

Given the draft nature of this BIMS initiative, debris management actors are yet to be finalised.

In addition, various city level contingency plans and national earthquake preparedness plans have been developed, which have provided input to the City Debris Action Plans.

### 7.1 Disaster response mechanism of Bangladesh and linkage to debris management issues

Key Disaster Management actors are mainly detailed in the Standing Orders on Disasters (SOD) and the Disaster Management Act. In the event of a high magnitude disaster, the Government can use statutory powers to nominate the relevant departments and organisations for deployment within the disaster management response.

Disaster Response coordination is allocated to the Disaster Management Committees at both National and Local level, which mainly deal with the emergency response during disaster. The National Response Coordination Group (NDRCG) and the Local Disaster Coordination Response Group (LDRCG) are responsible for managing the response approach with the application of the incident Command System (ICS) at both the National and Local level. NDRCG is also responsible for maintaining the ICS.

National Debris Management Guidelines have been prepared for the Government of Bangladesh by the UNDP Early Recovery Facility through integrated collaboration and full cooperation of the Department of Disaster Management of the Ministry of Disaster Management and Relief, in 2015. It focusses on the four largest cities.

These Debris Management Guidelines are envisaged to come under the purview of the NDRCG. In addition, the Bangladesh Disaster Management Structure is envisaged to be the most applicable regulatory framework for response coordination including debris management.

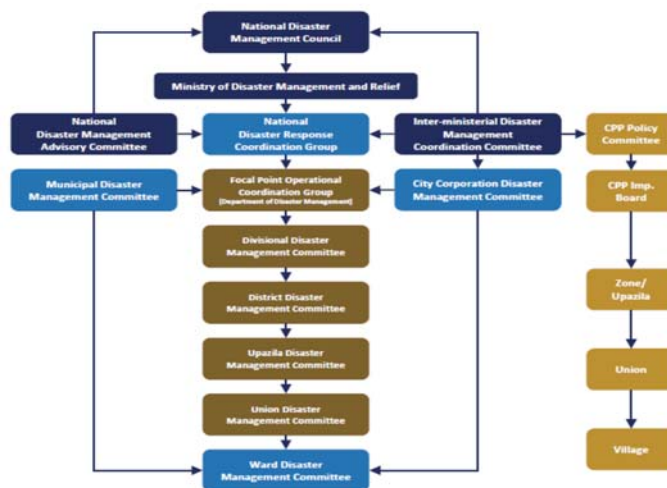


Figure 7.1.1: Disaster Management Structure in Bangladesh (Plain view in annex)

Note that the National Disaster Response Coordination Group (NDRCG) is the main central government focal point for disaster response and will be responsible for the overall debris management coordination in the event of a disaster in Bangladesh.

A narrative overview of the above Statutory Disaster Emergency Response Coordination Mechanism as follows:

- **Field 1:** This is the Central Government Ministerial level under the direction of the Prime Minister's office for coordination and planning at a national level for the whole of Bangladesh;
- **Field 2:** This is the City Corporation level to include for debris management and implementation activities based on support from the NDRCG and under the direction of the City management with support as required from the Deputy Commissioner and others;
- **Field 3:** Should the disaster be of national extent or of significant magnitude, the NDRCG can request the central Government to support and direct the various governmental departments and organisations, including especially the Armed Forces, to provide planning and implementation support as required;
- **Field 4:** For City and District specific disasters (that are not nationally impacting), the Deputy Commissioner can be requested by the City authorities to support and direct the various governmental departments and organisations, including especially the Armed Forces, to provide planning and implementation support as required;
- **Field 5:** Where required and requested by either the NDRCG or City authorities, the Deputy Commissioner can direct the Law & Order Enforcement agencies to respond and support the disaster response; and,
- **Field 6:** Enacting the various sections of the Disaster Management Act 2012, the Government can direct and engage with a range of supporting organisations such as NGOs, UN agencies, private sector, International NGOs etc to support the disaster response.

At the time of report preparation, it was not possible to confirm the functionality of the mechanism.

## 7.2 Regulatory framework for debris

To ensure and facilitate that the debris works are regulatory compliant to the national and regional laws and legislations, a review of the regulatory framework concerning debris and its management is required.

Thus the collation of applicable regulations that govern debris is required, which can include Waste Management Legislations, EIA legislations for instance. These are to be collated and included in the City Disaster Management Plans.

This assessment is also to include the Standing Orders on Disasters, Disaster Management Plans and related legal disaster preparedness planning procedures.

From the planning of the debris management, answers to the following issues are required and integrated into the ensuing debris management plan(s):

- a. Who owns the debris?
- b. When do they own the debris?
- c. Who has the liability for the debris removal and treatment?
- d. Are there any disaster exemptions governing debris ownership and management?



### 7.3 Key objectives of debris management in disaster response

The key success criteria for effective debris management in a disaster response situation, as aligned with the two main phases identified in the BIMS, include:

#### 7.3.1 For the Immediate/Response Phase (0 – 72hrs)

- **Immediate removal of debris from streets and access points** which hinder the approach of Search and Rescue (SAR) teams as well as routes for the emergency vehicles;
- **Removal of debris from critical and essential facilities** such as hospitals, fire stations, police stations and key government departments to enable their access and egress to carry out their immediate duties;
- **Removal of debris which may pose a public health threat** if containing hazardous materials and substances, for example heavily contaminated debris from industrial oils or fuels; and,
- **Removal of damaged building and structural elements** (i.e. unstable walls) and debris piles which pose an immediate threat to SAR teams, emergency response units as well as the public.

#### 7.3.2 For the Removal Phase (Short Term)

- Facilitate improved access to damaged homes and buildings by clearing debris thus enabling the return of residents and business owners;
- **Maximise local employment** within the debris management works through Cash-for-Work projects and debris recycling activities;
- **Respecting the rights of building owners** to both recover articles of personal value as well as determine whether they want for their debris to be removed;
- **Value recovery through recycling the debris** for use as construction materials in the local rehabilitation and reconstruction works;
- **Reduce the burden on raw materials** (i.e. quarries) by substituting raw construction materials with recycled debris;
- **Reduce the quantity of debris being disposed** of at often already overburdened dumpsites and landfills, thus extending the lifetime of disposal facilities in the region; and,
- **Ensure that the debris recycling** works are based on a sound consultative and participatory mechanism for the local stakeholders.

All of these objectives are both achievable and have been realised in past debris management programmes following natural disasters.

### 7.4 Typical debris composition

The following pictures are showing the type of construction of most shelters across the camps.

In a glance, the main elements in terms of composition of the expected debris, in case of a disaster, will be:

| Type of debris   | Percentage weight - volume <sup>7</sup> |          |
|--|---|----------|
| Bamboo   | 40 - 50 %                               | > 75 %   |
| Plastics from tarpaulin  | 5 - 15 %                                | 5 - 15 % |
| Metal (ferrous from CI sheets, aluminium for solar panel, etc)             | 15 - 25 %                               | 3 - 5 %  |
| Vegetation   | 5 - 10 %                                | 5 - 10 % |
| Soil   | 1 - 2 %                                 | 1 - 2 %  |
| Bricks and concrete (Storage facilities, police posts, health posts, etc.) | 0 - 5 %                                 | 0 - 5 %  |
| Various (not in any clear category)  | 5 - 10 %                                | 5 - 10 % |

**Table 7.4.1:** Volume and percentage of the various type of debris to expect

To understand the types and expected volume of debris, the following illustrations show the main construction types:



**Photo 7.4.1:** Registration building just rebuilt, June 2021



**Photo 7.4.2:** Shelter's proximity



**Photo 7.4.3:** Workers preparing elements for roof consolidation



**Photo 7.4.4:** Typical roof arrangement

<sup>7</sup> Temporary Solid Waste Facility Camp 20ext UNDP May 2021





Photo 7.4.5: Inside a shelter



Photo 7.4.6: Footpath



Photo 7.4.7: Little grocery



Photo 7.4.8: Concrete staircase



Photo 7.4.9: Shelter proximity and construction material



Photo 7.4.10: Vegetalised roof





Photo 7.4.11: Typical shelter



Photo 7.4.12: Typical shelter



Photo 7.4.13: paved secondary road



Photo 7.4.14: Typical roof consolidation



Photo 7.4.15: Semi-permanent storage



Photo 7.4.16: SW sorting and composting facility





Photo 7.4.17: CiC's office Nayapara Camp



Photo 7.4.18: soap making corner Nayapara



Photo 7.4.19: paved main road



Photo 7.4.20: paved main road

Note : All photos shot in the Cox's Bazar camps in June 2021

## 7.5 Priorities in dealing with debris

Immediately following a disaster, the main concern is on lifesaving measures such as Search and Rescue, as well as opening up routes to critical and essential facilities.

During this phase of disaster response, the handling of debris is often connected with either:

- **Search and rescue** operations where removing the debris and damaged buildings is required for access to the survivors;
- **Removal of debris from key access routes** (roads and highways) for emergency vehicles such as ambulances, fire engines and the police;
- **Removal of debris from critical and essential facilities** such as fire stations, hospitals, police stations etc.
- **Removal of unstable structures** which are at risk of further collapse;
- **General access for returning public and humanitarian assistance**; and,
- **Removal of debris to minimise public health risks** from the piles of debris becoming magnets for general waste disposal which in turn create a health risk through vermin, disease and odours.

## 8 ADEQUATION OF THE EXISTING NATIONAL PLANS AND THE REFUGEE CONTEXT

The national policies are mainly focussing on the four largest cities of Bangladesh, where the consequences of a severe disaster might have very different dimensions, compared with a non-modern urban setting.

The context of refugee camps is particular and cannot be directly compared to the cases of cities.

### 8.1 Shelter's typology

- Shelters are built with light material (bamboo, tarpaulin, etc) with limited metal or concrete parts.
- Average height of shelter is comprised between 2 and 3 meters, on a simple ground level only (with some limited exceptions such as in Camp 4 Ext).
- Electrical appliances are extremely limited inside the shelter.
- Furnitures are almost inexistant.
- Only very few buildings are more permanent, such as police posts, agencies offices, storages, clinics, schools, etc.



Photo 8.1.1: Market in camp 4 June 2021



Photo 8.1.2: Footpath between shelters

### 8.2 Settings and infrastructures

- The camps were predominantly self-settled, with no pre-emptive site planning. Consequently, the sites are spread over hilly terrain following an opportunist and organic design.
- Roads, footpaths, staircases, bridges, are limited in number and a quarter of the shelters are not connected to a drivable road.





**Photo 8.1.3:** typical bridge crossing a water stream



**Photo 8.1.4:** One of the numerous staircases allowing access to the hills

### 8.3 Debris (disaster waste) function of disaster and construction type

Many different models are trying to quantify the volume of debris generated by a major disaster, from earthquake to floods and cyclones. More than 20 have been assessed<sup>8</sup>, none being focussing on a refugee camp context.

To illustrate the discrepancy which could exist between the city and the camp contexts, the following average kg of debris per square meter of building to be expected, by type of building:

| <b>BUILDING TYPE statistically estimate</b>         | <b>[kg/m<sup>2</sup>]</b> |
|---|---------------------------|
| Wooden house  | 80 ± 30%                  |
| Single storey modern brick house                    | 736 ± 30%                 |
| Single storeys commercial building                  | 746 ± 30%                 |
| Multistorey commercial building                     | 817 ± 30%                 |
| <b>Measured after March 2021 fires in the camps</b> |                           |
| Shelter bamboo and tarpaulin                        | < 10                      |
| <b>Extrapolated in case of a cyclone (no fire)</b>  |                           |
| Shelter bamboo and tarpaulin                        | 50 ± 30%                  |

<sup>8</sup> Quantification of disaster waste - Review of the available methods - International Journal of Disaster Risk Reduction 53 (2021) 101996

**Table 8.3.1:** Literature estimate of debris generated by a disaster, by type of building, per square meter  
 Some examples of debris generated by different disasters on different types of constructions:



**Photo 8.3.1:** Multi-storeys building collapsed in Surfside Florida USA June 2021 KEYSTONE



**Photo 8.3.2:** Market shops collapsed, Camp 4, June 2021



**Photo 8.3.3:** Collapsed shelter, camp 4, June 2021



**Photo 8.3.4:** Banda Aceh, after an earthquake and a tsunami December 2004



**Photo 8.3.5:** Banda Aceh, after an earthquake and a tsunami December 2004



**Photo 8.3.6:** Banda Aceh, after an earthquake and a tsunami December 2004, elephant as a debris removal partner

The volume of debris varies significantly according to the type of disaster, its intensity and the type of buildings affected. The table below gives estimates of debris by disaster in the context of the camps in Cox's Bazar district.

Table 8.3.1: Disaster type vs expected damages type (General, applicable to the camps too)

| DISASTER TYPE     | DAMAGES TYPE  | PROBABILITY OF OCCURRENCE  |
|-------------------|---|----------------------------|
| <b>Earthquake</b> | <p>Structures collapse in-situ, trapping waste within damaged buildings and structures.</p> <p>Handling waste often requires heavy machinery, which communities may not be able to afford or have difficulty to access.</p> <p>Collapsed buildings may overlap across streets, making access difficult for the search and rescue and relief operations.</p> <p>Quantities of waste are high compared to other disaster types since all building contents normally become waste.</p> | <b>Medium to low</b>       |
| <b>Flood</b>      | <p>Floods often lead to important displacement, which in turn requires temporary accommodation.</p> <p>Initial damage depends on the structural integrity of infrastructure.</p> <p>Buildings are typically stripped by owners and waste placed on roads for collection.</p> <p>Flooding may bring mud, clay and gravel into affected areas, making access difficult once the floodwater recedes. Removal may be required for relief and recovery operations.</p>                   | <b>Low for large scale</b> |
| <b>Cyclone</b>    | <p>Strong winds can tear the roof off buildings, after which walls may collapse.</p> <p>Poorly constructed houses and shelters can ‘fold’ under roof tops. Even brick and concrete walls may collapse.</p> <p>Waste is spread across over open land, streets, and marketplaces. This roofing materials, small items and dust carried by the wind.</p>   | <b>Medium</b>              |
| <b>Fire</b>       | <p>Poorly constructed shelters are burning well and are difficult to extinguish before total combustion</p>   | <b>Medium to high</b>      |

## 9 DEBRIS MANAGEMENT CONTINGENCY PLAN

### 9.1 Disaster response

The Emergency Preparedness and Response (EPR) Action plan 2021, developed by the UNHCR brings already a proper answer to the mobilisation of actors in case of a disaster<sup>9</sup>, using the “One camp” approach.

#### 9.1.1 First responders

The first responders, in case of an emergency are the refugees themselves and more accurately the different groups of volunteers involved within the EPR, the DMU for instance:

| Type of community volunteers  | Number   |
|---|--|
| <b>Government of Bangladesh Cyclone Preparedness Program volunteers (CPP) HC volunteers</b> | On average between 3 to 4 volunteers per camp from the nearby host community, coordinated by BDRCS/IFRC.<br><br>The 3'400 DMU members are also trained and certified CPPs  |
| <b>Safety Unit Volunteers/Site Management Volunteers (SUV/SMS) DMU:</b>                     | 100 in each of the respective 34 camps   |
| <b>WASH Volunteers</b>  | Total number 1'374: <ul style="list-style-type: none"> <li>• Hygiene Promotion Volunteers (574),</li> <li>• Repair &amp; Maintenance Volunteers (106),</li> <li>• Solid Waste Management Volunteers (98),</li> <li>• Desludging Volunteers (89),</li> <li>• Water Network Maintenance Volunteers (38),</li> <li>• Pump Operators (82),</li> <li>• Assistant Sanitarians (114),</li> <li>• WASH Committees Members (273)</li> </ul> |
| <b>Community Outreach Members (COMs)</b>  | Total Number 416   |
| <b>Community Health Workers (CHW)</b>   | ~1'000 volunteer available   |

Table 9.1.1.1: Community volunteers

<sup>9</sup> Emergency Preparedness and Response Strategy UNHCR 2021



### 9.1.2 First damage assessment

The damage assessment, immediately after a major disaster will be undertaken and coordinated by:

- Disaster Management Units (DMU)
- Cyclone Preparedness Programme (CPP)
- WASH Volunteers
- Community Outreach Members (COM)

The first assessment will allow a first estimate of the volume of debris to be handled.

### 9.1.3 Inter-agency coordination

In a response to emergency incidents, partners communication and cooperation is necessary for a streamlined and coordinated response. Partners have provided UNHCR with their emergency planning and preparedness activities in the camps.

A greater coordination and effective collaboration between UNHCR, UN agencies, ISCG, and the Government of Bangladesh is prioritized in the 2021 preparation and response plan, including a focus on a “One Camp” approach and greater information sharing on prepositioned materials, trainings, etc.

UNHCR’s debris management contingency plan must be agreed through coordination and consultation with the Government of Bangladesh through Refugee Relief Repatriation Commissioner (RRRC), and the Camp in Charge (CiC) at the camp level, the local government of the district of Cox’s Bazar, the Upazila Nirbahi Officers (UNO) of Ukhiya and Teknaf, and the Army of Bangladesh that has a leading role in the country in responding to large scale emergencies and natural disasters.<sup>10</sup>

### 9.1.4 Response Plan

Scope: considering the Inter-sector Coordination Group (ISCG) coordination structure that does not fall into traditional refugee coordination response models, the response plan is mainly focused on settlements under UNHCR’s agreed Area of Responsibility (AoR), although broader communication, coordination, and protection planning is undertaken with others, based on a “One Camp” approach.

The Government of Bangladesh has agreed that official cyclone preparations will be considered across all camps, and UNHCR will work in support of Government of Bangladesh preparedness and response planning.

### 9.1.5 General Assumptions

1. **Refugees have demonstrated high levels of solidarity** and community self-reliance since the 2017 influx, and this capacity for community response is expected to continue.
2. **Access in extreme cases**, such as in case of cyclone, will be limited and controlled by the government, specifically by the Army.
3. **UNHCR will coordinate with IOM, WFP, UNICEF, BDRCS** and other operational partners to meet needs in all camps, if required and resources available.

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<sup>10</sup> **Note** : The text framed in red show an action to be continued, refer to Annexes : To do list

### **9.1.6 Refugees as key actors for first response/linked to the Disaster Management Committee (DMCs)**

Trained SUVs - Safety Unit Volunteers/SMS volunteers, CPPs, and CHWs, PERUs alongside Community Groups of women, men, and youth will serve as first responders after any incident, including debris management.

Volunteers are being trained on conducting post-disaster rapid assessments and the mode of channelling information (see communication flowchart below).

The Disaster Management Committee at each camp will be activated in case of emergency, consisting of the membership of the CiC of the camp, the sector focal points, the Site Management Support (SMS) agency, the local government DRR officer, community leaders and volunteers.

Under such a system, refugee first responders will report and categorize all incidents as either:

- 1) no need for intervention by the CiC, UNHCR/partners;
- 2) intervention required, primarily by the DMUs (SMS, SUVs) as the Site Management volunteers and the main DRR volunteer group.

Such practices have already been demonstrated to exist in the camps, with Community Groups and community volunteers rapidly responding to weather-related incidents in March and September 2019 without prior prompting by UNHCR or partners and in number of similar incidents in 2021 as well.

When UNHCR and partners are needed, designated UNHCR/partner teams will coordinate the response at camp level in collaboration with the CiC and sector focal point members of the camp Disaster Management Committee.

In an event of disaster, all the local officials, UN agencies and implementing partners active in the camps must know whom to contact for assistance and understand the roles and responsibilities of each agency involved in the response to effectively coordinate recovery efforts. This is true for disaster waste and emergency coordination in general.

The emergency response communication flowchart (see below) presents the different stakeholders of an emergency response, from the camp level to the State entities.



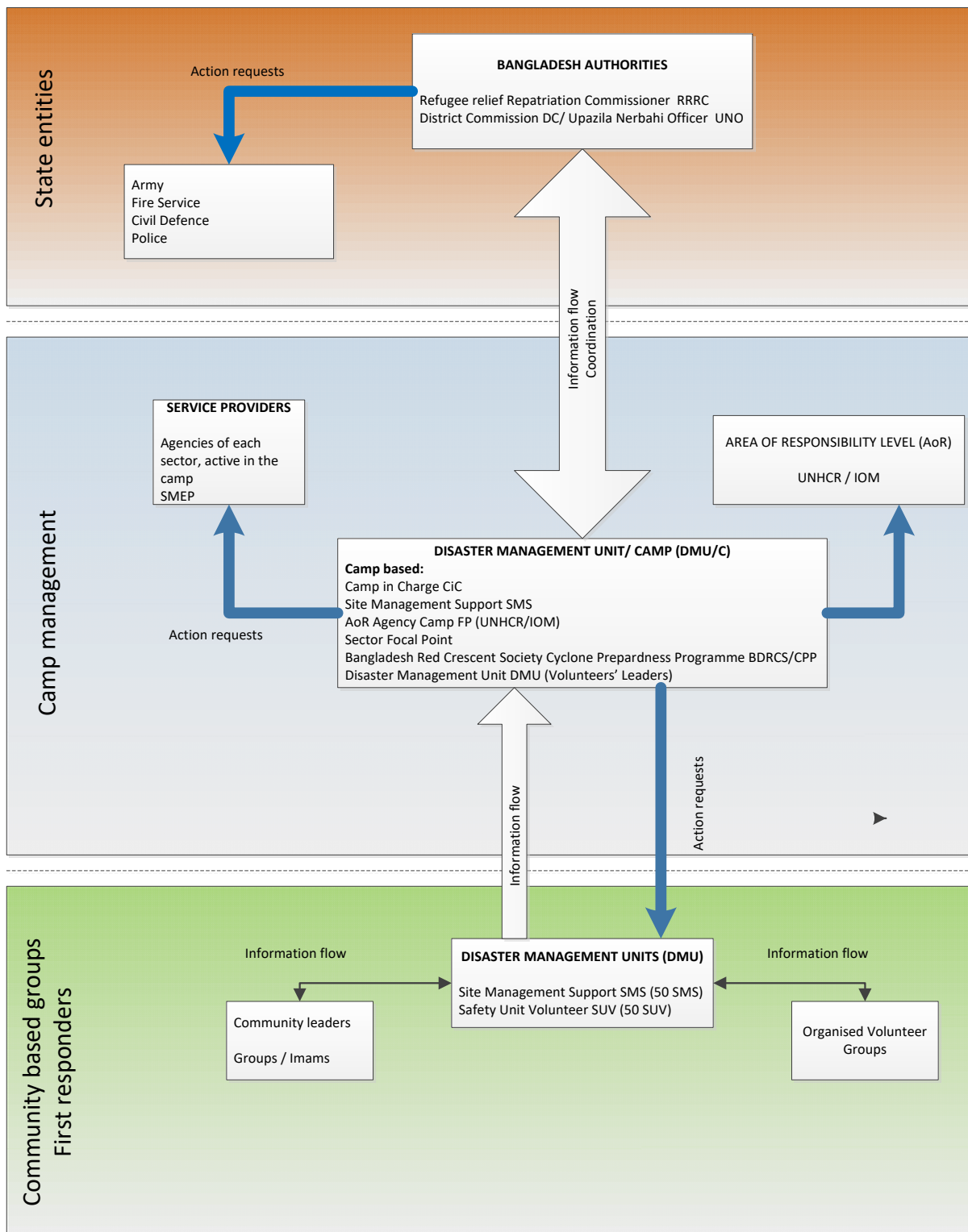


Figure 9.1.6.1: Emergency response: Coordination and communication flowchart

## 9.2 Types of debris and amounts forecast

The materials that will likely make up the disaster waste stream has been evaluated in order to define appropriate measures to be put in place to address them in the event of a disaster.

In a glance, the main elements of the expected debris in terms of composition and volume, in case of a disaster, (refer to chapters 7.4 and 8.3.1) will be:

| Material   | Percentage weight - volume <sup>11</sup> estimate |           |
|--|---|-----------|
|  | Bamboo  | 40 - 50 % |
| Plastics from tarpaulin  | 5 - 15 %  | 5 - 15 %  |
| Metal (ferrous from CI sheets, aluminium for solar panel, etc) | 15 - 25 %   | 3 - 5 %   |
| Vegetation   | 5 - 10 %  | 5 - 10 %  |
| Soil   | 1 - 2 %   | 1 - 2 %   |
| Bricks and concrete  | 0 - 5 %   | 0 - 5 %   |
| Various (not in any clear category)                            | 5 - 10 %  | 5 - 10 %  |

**Table 9.2.1:** Estimate volume percentage for each category of debris

Domestic waste are not included, having to be managed according to the existing SWM system in place.

Nevertheless, some points to consider:

- **Domestic waste.** Day-to-day household waste will be approximately the same per capita as before the disaster.
- **Waste from the internally displaced refugees.** The majority of waste will be produced in their temporary relocations, and special measures for waste management must be put in place since waste may include new items with increased packaging such as plastic bottles.

<sup>11</sup> Temporary Solid Waste Facility Camp 20ext UNDP May 2021

Table 9.2.2: Volume of debris forecasted for different scenario, calculated for the Cox's Bazar district's camps

| DISASTER TYPE | INTENSITY                     | EPR scenario | PROBABILITY OF OCCURRENCE | Level of expected damage [% of shelters impacted] | LEVEL OF DESTRUCON / EXPECTABLE VOLUME OF DEBRIS [m <sup>3</sup> ] |                   |                   |             |
|---------------|-------------------------------|--------------|---------------------------|---|--|-------------------|-------------------|-------------|
|               |                               |              |                           |   | > 25 %   | 25 – 50%          | 50 – 75 %         | > 75%       |
| Earthquake    | > 4<br>(Richter scale)        | Moderate     | Medium to low             | < 0.1%  | < 200  | -                 | -                 | -           |
|               | 4 – 5                         | Major        |                           | < 0.5%  | < 1000   | -                 | -                 | -           |
|               | > 5                           | Extreme      |                           | > 0.5%  | > 1000   | 1000 - 2000       | -                 | -           |
| Flood         | 0 – 0.5m                      | Moderate     | Low for large scale       | < 0.1%  | < 200  | 200 - 400         | 400 - 600         | > 600       |
|               | 0.5 – 1 m                     | Major        |                           | < 1%  | < 2000   | 2000 - 4000       | 4000 - 6000       | < 6000      |
|               | > 1 m                         | Extreme      |                           | > 1%  | > 2000   | 2000 - 4000       | 4000 - 6000       | > 6000      |
| Cyclone       | 1<br>(89 – 117 km/h)          | Moderate     | Medium                    | < 25 %  | < 50'000   | 50'000 – 100'000  | 100'000 – 150'000 | > 150'000   |
|               | 2<br>(118 – 165 km/h)         | Major        |                           | 50 %  | > 100'000  | 100'000 – 200'000 | 200'000 – 300'000 | > 300'000   |
|               | 3<br>(166 – 220 km/h)         | Extreme      |                           | > 50%   | > 100'000  | 100'000 – 200'000 | 200'000 – 300'000 | > 300'000   |
| Fire          | 0 – 1 %<br>shelters destroyed | Moderate     | Medium to high            | < 1 %   | -  | -                 | -                 | < 1000      |
|               | 1 – 3 %<br>shelters destroyed | Major        |                           | 1 – 3 %   | -  | -                 | -                 | 1000 - 3000 |
|               | 4 – 5 %<br>shelters destroyed | Extreme      |                           | 4 – 5 %   | -  | -                 | -                 | 3000 – 5000 |

**Note:** Colours refer to the usual standards as given with the attached maps and tables

**Assumptions:** camps count some 200'000 shelters – Debris (100% shelter destruction = ~ 50kg/m<sup>2</sup> or ~ 0.15 m<sup>3</sup> / m<sup>2</sup> or 4 m<sup>3</sup> per shelter)

Table XXX: Volume of debris estimate

**9.3 Inventory of the current capacity for waste management and waste tracking mechanisms**

Today, the camps have a landfill (TSWF) located on the edge of camp 20 Ext. Its planned capacity is 40,000m<sup>3</sup>, which corresponds to a residual capacity of 3-4 years. The facility has an extension of 2,860m<sup>2</sup>.

A number of sorting and composting centres also provide some temporary storage. To date, less than half of the waste that should be landfilled actually arrives at the landfill.

**9.3.1 Planned capacity of the Temporary Solid Waste Facility (TSWF)<sup>12</sup>**

The TSWF (sanitary landfill) has been constructed for the final disposal of the solid waste (non-recyclable) generated in the Rohingya Refugee camps (Megacamp) in Ukhia.

Due to the morphology of the area, its development has been planned as follows:

| Phases capacity                     | Capacity [m <sup>3</sup> ] | Layers height of [m] |
|-------------------------------------|----------------------------|----------------------|
| Phase I current capacity (May 2021) | 8'500                      | 2.0 – 2.5            |
| Phase II (ongoing)                  | 22'000                     | 5.0 – 5.5            |
| Phase III (Maximum capacity)        | 40'000                     | Up to 10 m           |

Table 9.3.1.1: Planned capacity of the TSWF



<sup>12</sup> SOPs TSWF landfill Camp 20ext Ukhia Upazila Bangladesh UNDP 2020  
Temporary Solid Waste Facility Camp 20ext UNDP 2021

**Photo 9.3.1.1:** Layout Plan of Ukhia Camp20ext. Landfill (UNDP, 2019)

An inventory and mapping of all the existing facilities within the camps has to be established for:

- Sorting and composting facilities (location, surfaces, capacity)
- Pre-selected temporary waste and debris storage sites (surface > 100 m<sup>2</sup>). Taking into account that the same sites could also be considered for temporary relocation of displaced refugees,

The same type of inventory has to be done for the neighbouring facilities (up to 20 km from the camps).

### **9.3.2 Temporary waste and debris storage sites specifics**

Sites should:

- not be in a floodplain or wetland;
- be of appropriate size for anticipated waste;
- have appropriate topography and soil type;
- be located at a safe distance from potable water wells and rivers, water reservoirs and streams;
- have controls to mitigate storm water runoff, erosion, fires and dust;
- be free from obstructions such as power and pipe lines;
- have limited access with only certain areas (e.g. for drop-off) open to the public;
- be located close to the disaster-prone area, but at a safe distance from shelters / houses and infrastructures that could be affected by site operations during the recovery period;
- preferably be on public land. However, private land may be convenient and logistically necessary. (In this case, pre-agreements with private land owners has d to be considered to ensure the use of the needed areas in case of major disaster)

The condition of temporary sites should be evaluated and documented prior to use.

A rapid environmental assessment (REA) should be carried out for the largest potential temporary dumpsites (Surface >3 000 m<sup>2</sup>)

### **9.3.3 Debris tracking mechanisms**

Tracking is important to:

- 1) determine the amount of waste from the disaster
- 2) determine the capacity being used and remaining at various waste management locations and
- 3) pay waste haulers, who are normally paid according to the quantity of waste transported.

The existing SWMSs in place are already (or should be) measuring the volumes of waste for the different categories of carrier.

Consequently, a data recording system has to be established to ensure counting the number of each carrier downloading debris on a given site.

#### **9.3.4 Transportation means**

The camps configuration, with limited roads usable by trucks, dictates the need of using all possible ways:

- Trucks when roads are large enough;
- Tricycles;
- Donkey carts;
- Man Back carrying system;

#### **9.4 Equipment needs**

Thanks to the Emergency Preparedness and Response (EPR) action plan and all the other initiatives taken across the camps, the identified volunteers (See chapter 10.1: *Disaster response*), are already equipped with minimum Personal Protective Equipment (PPE).

The following checklist has to be crossed with the existing equipment in place with the different camp management stakeholders:

##### **9.4.1 Primary needs for initial response**

- additional PPE items (first aid kits, safety vests, work gloves, protective boots etc.);
- torches and flashlights;
- chainsaws;
- debris/earth moving equipment, such as skid-steer loaders, front loaders, excavators and grapples;
- dump trucks and roll-off trucks;
- fuel;
- generators;
- handheld GPS to record waste locations;
- handheld radios, cell phones, satellite phones, and/ or wireless handheld devices;
- batteries;
- notebooks and cameras;
- road signs to direct debris hauler traffic; and
- vehicle repair equipment.

##### **9.4.2 Secondary needs for waste processing:**

- plastic sheeting;
- sealable plastic drums;
- wood grinders;



### 9.4.3 Tertiary needs for processing large volumes of rubble

- shredders;

### 9.5 Harmful materials and hazardous waste

In the context of the refugee camps, hazardous waste such as batteries (automotive types or lithium) or liquefied gas containers may be generated in a disaster.

Even if quantities might be very limited, such hazardous waste have to be separated and directed to the existing recycling channels.

Small quantities of medical waste from clinics might also be found. A special facility for such waste exists beside the TSWF, in the camp 20 Ext.

### 9.6 Recycling options

The recycling options will be similar to the SWM, except for the quantities. The sorting scheme can be as follows:

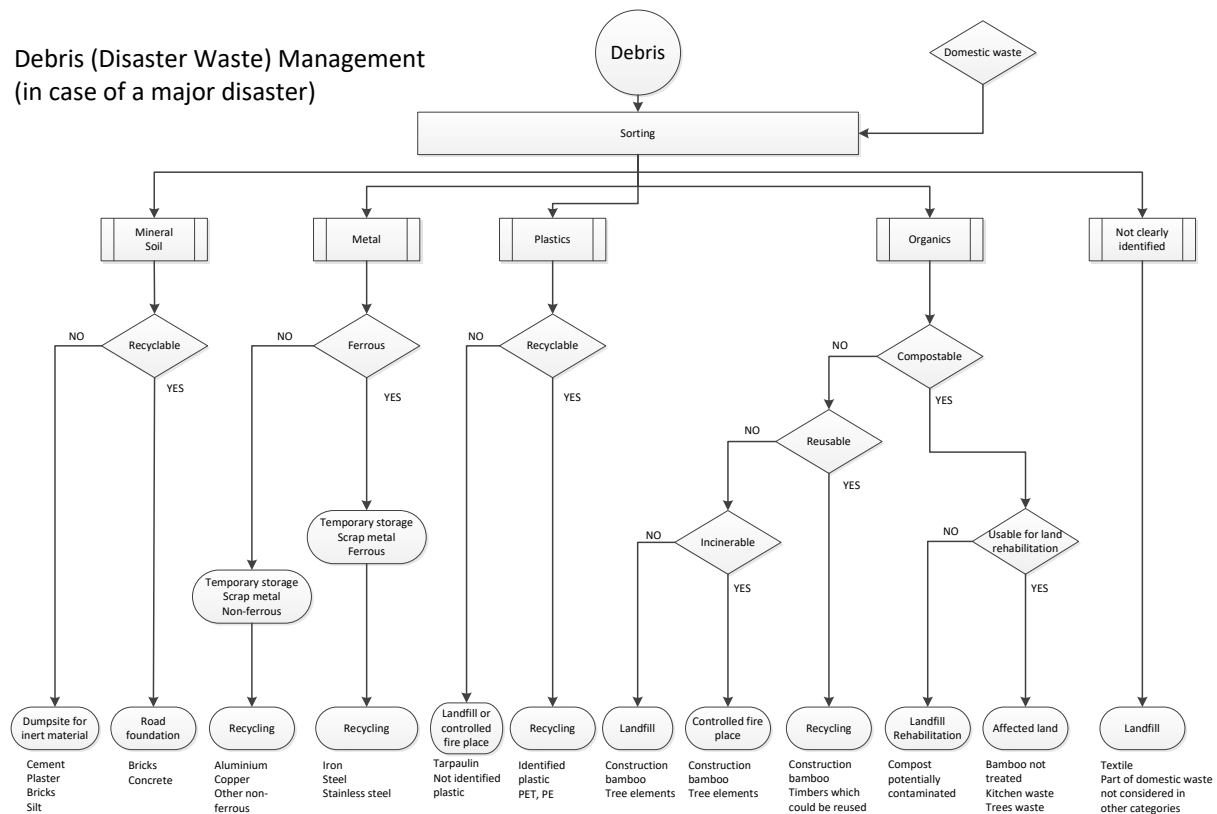


Figure 9.6.1: Logical diagram for debris management (full scale in the annexes)

### 9.7 Researching waste-to-energy option

One possible option, to be investigated, could be to shred the bamboo debris to allow loading the brick factories kilns.

Well prepared, it could replace or be added to the existing systems.

### 9.8 Evaluating disposal options

Environmental monitoring. Areas to be used to stage vegetative debris do not typically require groundwater monitoring, but should be monitored for fires. Areas to be used

to stage mixed rubble or hazardous waste may need more extensive monitoring. Consult with the national authorities for recommendations.

Evaluating traffic logistics on and around the storage site

### **9.9 Evaluating open burning options**

Open burning is normally a last resort but may be an option in case of large quantities of incinerable material. It should be conducted in accordance with best available practice to protect human health and the environment. Typically, only vegetative debris should be burned in an open pit.

Vegetative debris, dead animals and segregated clean building material may be burned in an Air Curtain Incinerator (ACI). This option should be considered in the case of a major disaster.

This method consists of a pit constructed by digging below grade or building above grade (if there is a shallow groundwater table) and a blower. The blower must have adequate air velocity to provide a "curtain effect" to hold smoke in and to feed air to the fire below.

The pit must have a precise width, depth and length to compliment the blower. Some incinerators are portable and utilize a premanufactured pit in lieu of an on-site constructed earth/ limestone pit.

Portable ACIs are the most efficient burning systems available. They require little or no maintenance, whereas earth or stone pits which are susceptible to erosion. Portable ACI units are suitable for areas with shallow groundwater tables, sandy soils, and where smoke must be kept to a minimum.

## **10 CONCLUSION AND RECOMMENDATIONS**

The management of crisis situations related to natural and man-made disasters in Bangladesh has a well-defined legal framework and enforcement tools. However, most of the tools are focused on the main urban centres and definitely not on refugee camps.

The Emergency Preparedness and Response Plan (EPR plan) developed for camps by UNHCR and IOM for the camps, forms the basis of the disaster response architecture for all response sectors (from WASH to Protection).

Debris management is an element to be integrated into this structure and must not be a standalone topic.

This document is not yet a contingency plan but prepares the framework and its content. In order to complete the work in progress, further information listed below needs to be collected in a first step, and then integrated into the Figure 9.1.6.1: Emergency response: Coordination and communication flowchart.

The next step will be the approval phase by governmental, UN and IP partners.

Finally, as part of the EPR exercises, the debris management contingency plan will be tested in real life and adjusted according to field observations.

## 10.1 Recommendations for the next steps

### 10.1.1 SWM vs Debris management

A common idea is that debris management is similar to solid waste management. It is not the case. The two pictures below, taken in the camps, show the main differences:

- The composition is significantly different
- The quantities involved are incomparable



**Photo 10.1.1:** Debris in the camp 9 on 29 March 2021



**Photo 10.1.2:** Solid waste sorting boxes

Nevertheless, some infrastructure related to the SWM may be temporarily used for debris management in the event of a disaster, such as the sorting places, the composting plants or the TSWF.

**It is therefore recommended** that debris management be linked to the emergency response rather than to the solid waste management service which is designed for non-critical phase operation.

In the event of a disaster, the SWM will in any case have to continue to operate for the treatment of household waste and possibly manage the packaging and leftover food distributed in the emergency response phase.

### 10.1.2 Documents to collect

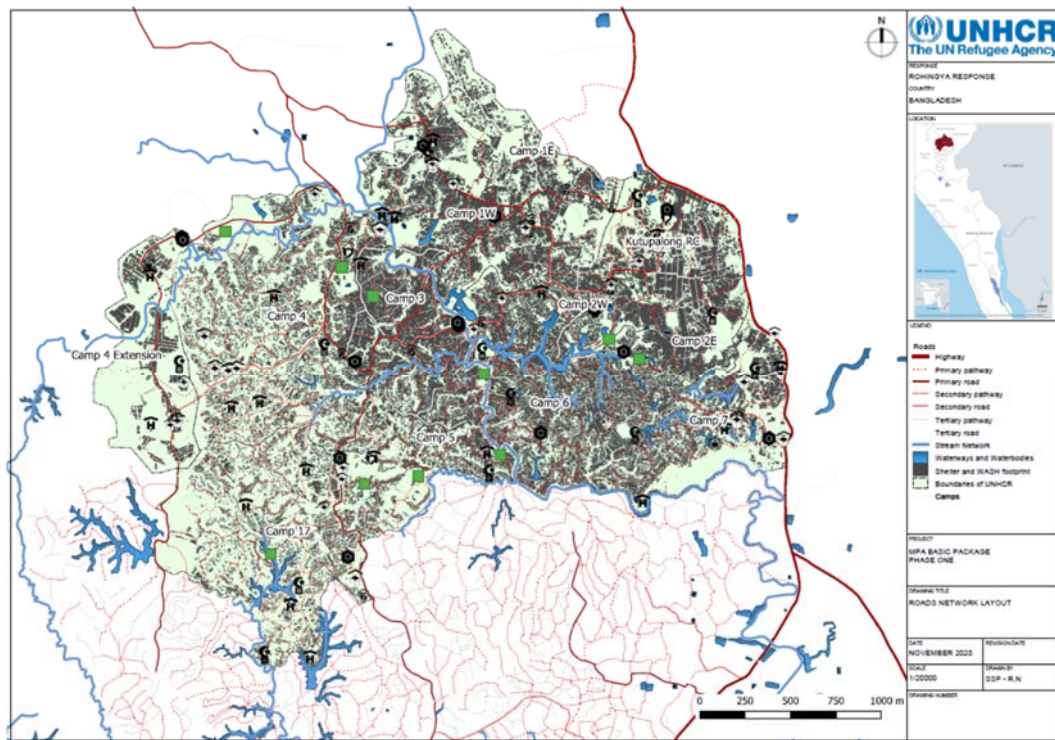
In the event of a disaster, the response coordination structure must be able to rely on up-to-date and reliable documentation.

In the specific case of debris management, the key issues are:

- Logistic, evacuation ways
- Areas to temporarily store the debris, in the camps and outside

**It is therefore recommended** that the following documents are collected, developed and regularly updated:

- **Road maps of the camps**, format A0, one per camp at least. The files should be accessible at any time.  
Example: road layout of Kutapalong, (not at proper scale)



- **Maps emphasising the potential temporary storage areas for the debris, within the camps and outside.**

Such maps will make it possible, when the time comes, to delimit the areas affected by the disaster, to identify usable roads and to define the routes according to the logistical means available.

While 'road' maps seem to exist, the identification and mapping of temporary debris storage sites still needs to be developed.

UNDP having managed the development of the current landfill and the search for potential new sites should be able to provide key information.

### 10.1.3 Legal compliance

This report does not claim to have analysed all the legal aspects involved in the management of debris and temporary storage sites.

However, in the absence of a clear local legal framework, the UN should endeavour to follow standard best practice, as used by the World Bank, for example in the field of environmental impact assessment.

### 10.1.4 Negotiations and information

In order to secure the agreement of all partners involved in the emergency response within a reasonable period of time, it is important to structure the discussions and negotiations.

While everyone has an opinion on debris management, in reality very few have experience of it.

It is therefore important to present completed documents and a clear and understandable action plan to the various partners.



**It is therefore recommended** to structure and prepare carefully the communication, avoiding generating one more technical working group.

At a technical level, discussions have already started during the mission leading to this report.

At the higher level and in relations with the authorities, no discussions took place.

### 10.1.5 Practical exercise

The topic of debris management should be included in the next EPR exercise to familiarise all stakeholders with this particular topic.

A short training course should be prepared to train volunteers and stakeholders in the emergency management mechanism. A first exercise can already be done as test phase even before its overall agreement. As a first step, it can also be tested as a theoretical exercise, in room, on maps.

## 10.2 Next steps - roadmap

In order to facilitate further preparation of the emergency response plan for debris management, the following steps are recommended:

| Steps | Ref. § | What   |
|-------|--------|--|
| 1     | 9.3.4  | <b>Mapping of main and secondary roads</b> , trails, related infrastructure, etc.  |
| 2     | 9.3.1  | An <b>inventory and mapping of all the existing facilities</b> within the camps has to be established for: <ul style="list-style-type: none"> <li>• Sorting and composting facilities (location, surfaces, capacity) to be used as temporary storage</li> <li>• Pre-selected temporary waste and debris storage sites (surface &gt; 100 m<sup>2</sup>). Taking into account that the same sites could also be considered for temporary relocation of displaced refugees</li> </ul> The same type of inventory has to be done for the neighbouring facilities (up to 20 km from the camps). |
| 3     | 9.3.1  | <b>A rapid environmental assessment (REA)</b> should be carried out for the largest potential temporary dumpsites (Surface >3 000 m <sup>2</sup> )   |
| 4     |        | <b>A debris management manual</b> should be prepared, linked to the EPR, to facilitate decision-making in the event of a disaster<br>It should help choosing the temporary storage sites according to the context, choosing the ways to follow, pre-organise the intervention of each stakeholders from inside the camp as well as from outside.   |
| 5     | 9.1.3  | <b>Negotiation</b> with the partners and stakeholders in order to get their acceptance   |
| 6     | 9.4    | <b>Specific equipment needs:</b> the following checklist has to be crossed with the existing equipment in place with the different camp management stakeholders:   |
| 7     | 9.3.3  | Debris tracking: a data recording system has to be established to ensure counting the number of each carrier downloading debris on a given site.   |

|   |     |   |
|---|-----|---|
| 8 | 9.7 | <p>The <b>sorting of the debris</b> will lead to different categories, including recyclable items.</p> <p>The <b>different recycling channels</b> should be investigated in a concrete way and a detailed inventory should be made so that quick decisions can be taken in case of a disaster.</p> <p>For instance: <b>energy recovery</b>. One option could be to use it as combustible for the brick kiln present in the region. Investigation and preliminary contacts should be established</p> |
|---|-----|---|

## ANNEXES

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| 4  | Figure 9.6.1: Logical diagram for debris management   |
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| 8  | Proposed further readings   |
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| 10 | Some pictures of Dominica (Caribbean Island) after the hurricane Maria 2017   |

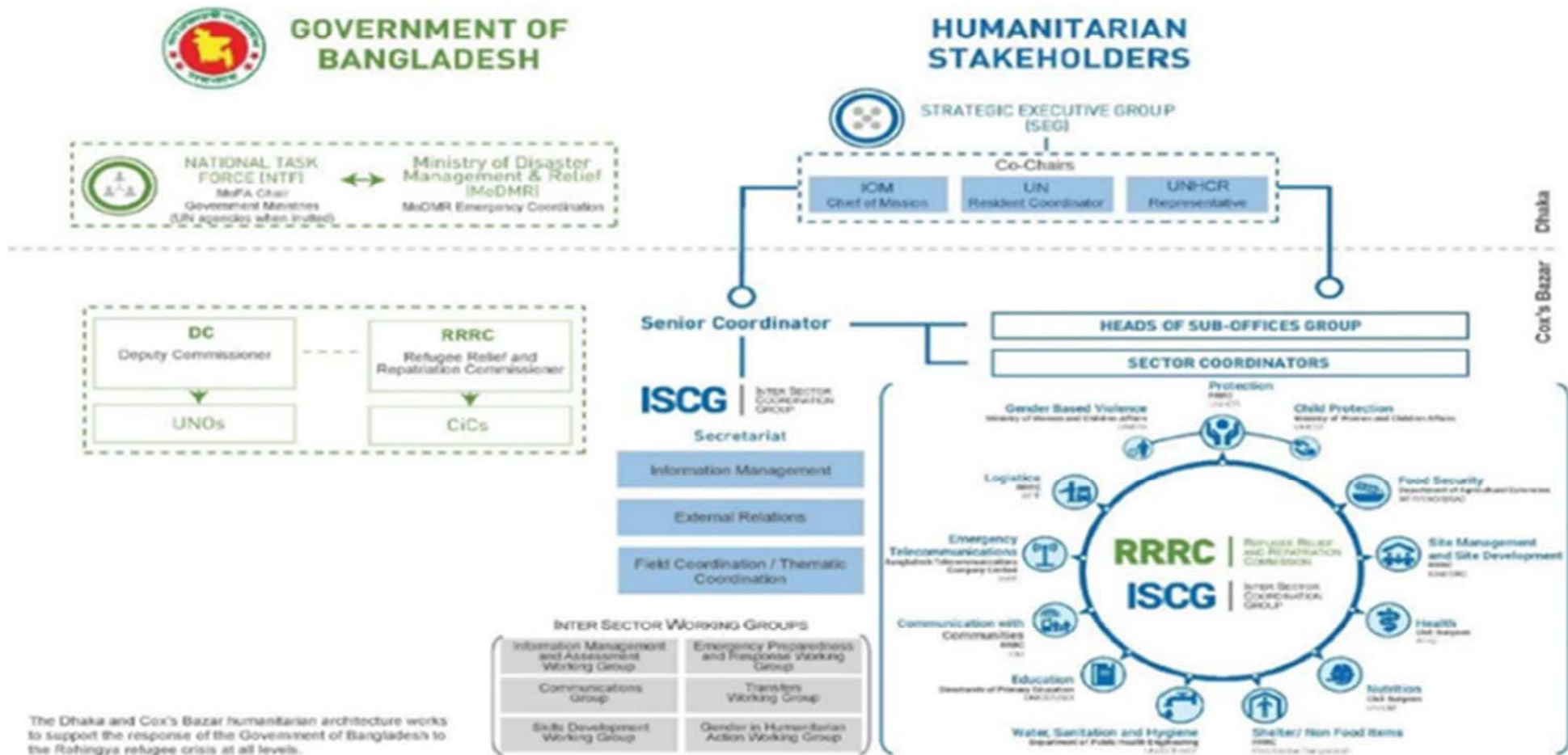
## ANNEX 1: Tropical cyclone classification

| Tropical Cyclone Classifications <span style="float: right;">[hide]</span> |   |   |   |                     |                                 |                                       |                           |  |                                    |
|--|---|---|---|---------------------|---------------------------------|---------------------------------------|---------------------------|--|------------------------------------|
| Beaufort scale   | 1-minute sustained winds<br>(NHC/CPHC/JTWC) | 10-minute sustained winds<br>(WMO/JMA/MF/BOM/FMS) | NE Pacific & N Atlantic<br>NHC/CPHC <sup>[26]</sup> | NW Pacific<br>JTWC  | NW Pacific<br>JMA               | N Indian Ocean<br>IMD <sup>[27]</sup> | SW Indian Ocean<br>MF     | Australia & S Pacific<br>BOM/FMS <sup>[10]</sup> |                                    |
| 0–7  | <32 knots (37 mph; 59 km/h)                 | <28 knots (32 mph; 52 km/h)                       | Tropical Depression                                 | Tropical Depression | Tropical Depression             | Depression                            | Zone of Disturbed Weather | Tropical Disturbance                             |                                    |
| 7  | 33 knots (38 mph; 61 km/h)                  | 28–29 knots (32–33 mph; 52–54 km/h)               |   |                     |                                 | Deep Depression                       | Tropical Disturbance      | Tropical Depression                              |                                    |
| 8  | 34–37 knots (39–43 mph; 63–69 km/h)         | 30–33 knots (35–38 mph; 56–61 km/h)               | Tropical Storm                                      | Tropical Storm      |                                 | Cyclonic Storm                        | Moderate Tropical Storm   | Tropical Low                                     |                                    |
| 9–10   | 38–54 knots (44–62 mph; 70–100 km/h)        | 34–47 knots (39–54 mph; 63–87 km/h)               |   |                     | Severe Tropical Storm           | Severe Cyclonic Storm                 | Severe Tropical Storm     | Category 1 Tropical Cyclone                      |                                    |
| 11   | 55–63 knots (63–72 mph; 102–117 km/h)       | 48–55 knots (55–63 mph; 89–102 km/h)              |   |                     | Category 1 Hurricane            | Typhoon                               | Typhoon                   | Very Severe Cyclonic Storm                       | Tropical Cyclone                   |
| 12+  | 64–71 knots (74–82 mph; 119–131 km/h)       | 56–63 knots (64–72 mph; 104–117 km/h)             | Category 2 Hurricane                                |                     |                                 |                                       |                           |  |                                    |
|  | 72–82 knots (83–94 mph; 133–152 km/h)       | 64–72 knots (74–83 mph; 119–133 km/h)             | Category 3 Major Hurricane                          | Very Strong Typhoon | Extremely Severe Cyclonic Storm |                                       | Intense Tropical Cyclone  | Category 4 Severe Tropical Cyclone               |                                    |
|  | 83–95 knots (96–109 mph; 154–176 km/h)      | 73–83 knots (84–96 mph; 135–154 km/h)             | Category 4 Major Hurricane                          |                     |                                 |                                       |                           |  |                                    |
|  | 96–97 knots (110–112 mph; 178–180 km/h)     | 84–85 knots (97–98 mph; 156–157 km/h)             | Category 5 Major Hurricane                          | Super Typhoon       | Violent Typhoon                 |                                       | Super Cyclonic Storm      | Very Intense Tropical Cyclone                    | Category 5 Severe Tropical Cyclone |
|  | 98–112 knots (113–129 mph; 181–207 km/h)    | 86–98 knots (99–113 mph; 159–181 km/h)            |   |                     |                                 |                                       |                           |  |                                    |
|  | 113–122 knots (130–140 mph; 209–226 km/h)   | 99–107 knots (114–123 mph; 183–198 km/h)          |   |                     |                                 |                                       |                           |  |                                    |
| 123–129 knots (142–148 mph; 228–239 km/h)                                  | 108–113 knots (124–130 mph; 200–209 km/h)   |   |   |                     |                                 |                                       |                           |  |                                    |
| 130–136 knots (150–157 mph; 241–252 km/h)                                  | 114–119 knots (131–137 mph; 211–220 km/h)   |   |   |                     |                                 |                                       |                           |  |                                    |
| >136 knots (157 mph; 252 km/h)   | >120 knots (138 mph; 222 km/h)              |   |   |                     |                                 |                                       |                           |  |                                    |



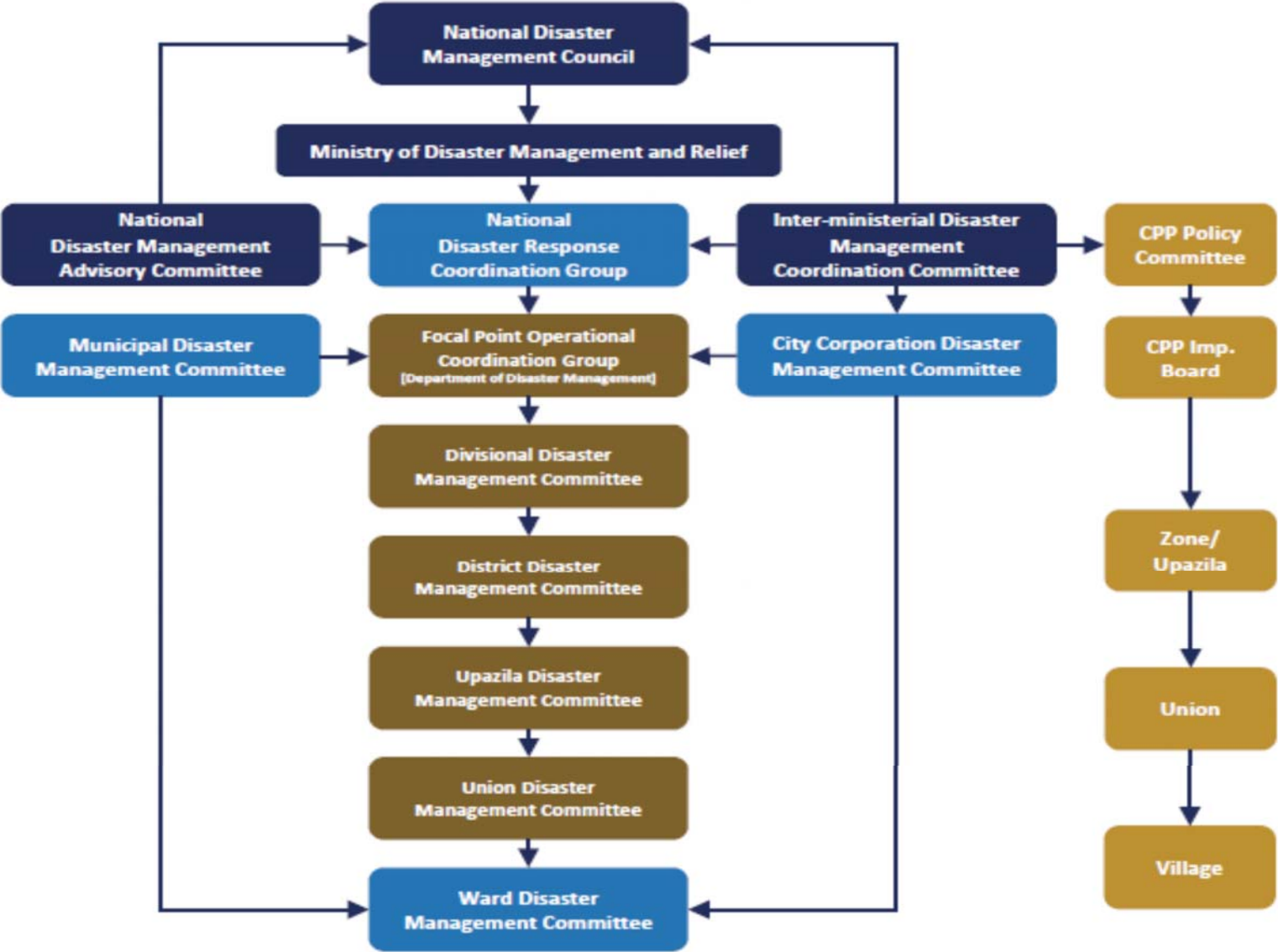
ANNEX 2: Figure 3.1: The Current Coordination Structure in dealing with Rohingya Refugee Situations in Bangladesh, as per January 2021

## Coordination architecture for the Rohingya humanitarian crisis



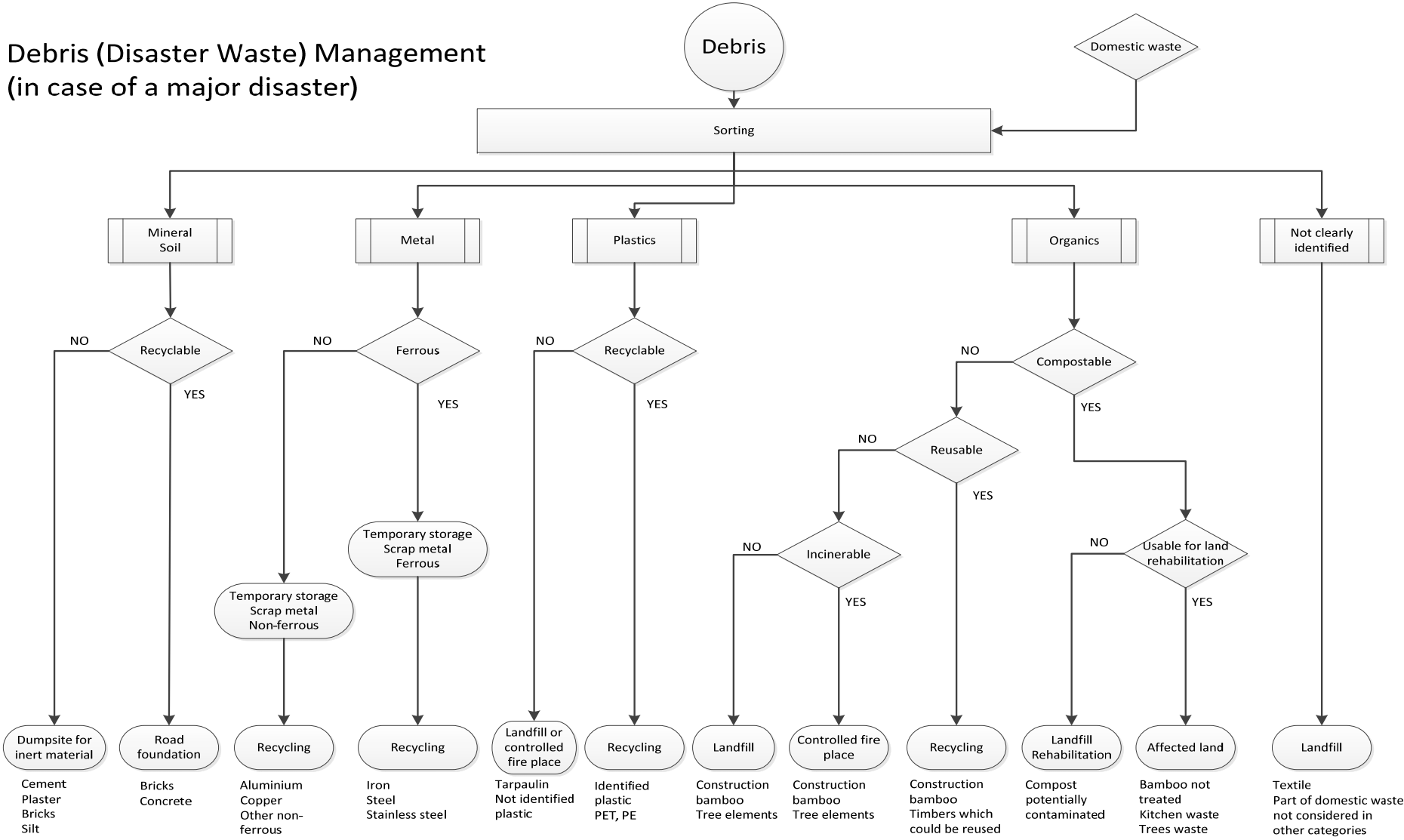
The Dhaka and Cox's Bazar humanitarian architecture works to support the response of the Government of Bangladesh to the Rohingya refugee crisis at all levels.

ANNEX 3: Figure 7.1.1: Disaster Management Structure in Bangladesh

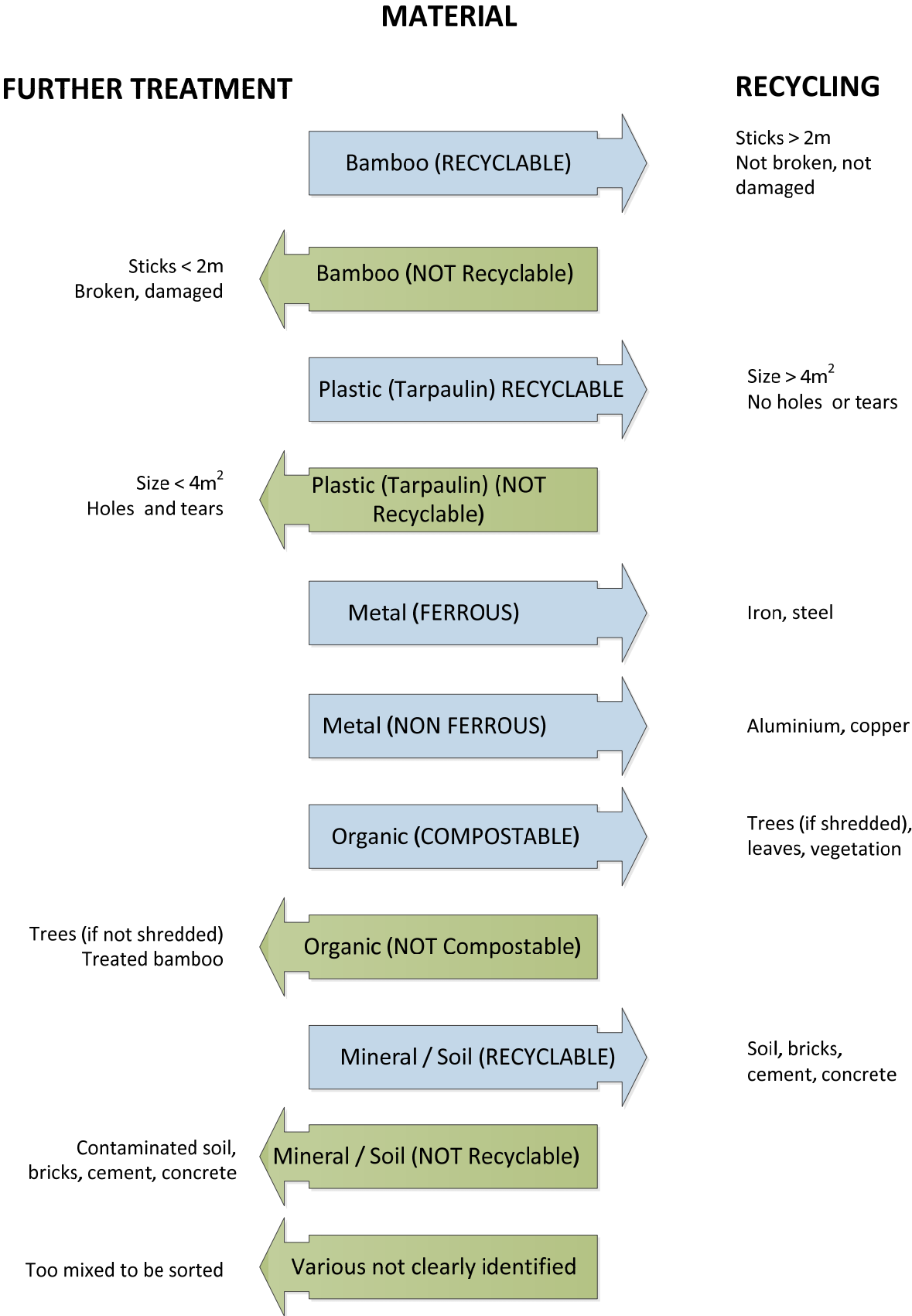


ANNEX 4: Figure 9.6.1: Logical diagram for debris management

Debris (Disaster Waste) Management  
(in case of a major disaster)



# ANNEX 5: Simple instruction diagram for sorting debris



## ANNEX 6: Operational Plan of UNHCR Cox's Bazar Emergency Response Team (ERT) October 2020

### Operational Modalities

- The activation and deployment of ERT members during the extreme weathers and cyclone seasons to Ukhiya and Teknaf will be decided by Head of Sub office (HoSo), or Officer in Charge (OiC). However, ERT focal points for Ukhiya and Teknaf should alert all ERT team leaders and members to remain on standby for possible deployment, within short notice during the extreme weather and cyclone seasons. Depending on the decision from HoSo, ERT members should be ready to stay overnight in Ukhiya and Teknaf for the duration assigned by the HoSo.
- The accommodations for ERT members during the mission in Ukhiya and Teknaf will be decided in coordination with UNHCR Field Security Unit.
- ERT teams will be deployed in 4WD vehicles of 2 staff members (+ 1 driver). Teams should always maintain communication among the group. If the group should not be able to communicate for more than 15 mins they should head to the vehicle and reconvene.
- Back up ERT Team
  - On standby in Cox's Bazar during the deployment of other ERT members
  - To be deployed based on the operational need to support the ERT teams
- Roles and Responsibility of the Focal Points and Team leaders before, during and after the deployment.

#### Before the Deployment:

- A closed WhatsApp group to be maintained for the purposes of information sharing between the team members.
- To provide regular training and information sessions for ERT members before the extreme weather and cyclone seasons.
- To get monthly update from distribution teams on the stock availability in each UNHCR distribution points of Ukhiya and Teknaf.
- To coordinate with fleet team for the vehicle arrangements and to check emergency items including Emergency Trauma Bag in each vehicle.
- To coordinate with IT team for the preposition of VHF radios and batteries and other back up communications items for the teams.
- To maintain close coordination and communication with emergency focal points from IOM, WFP, Site Management partners, BDRCS, CPP and refugee committees.
- To get the latest maps and population figures of each camps and other require information tools from IM Unit.
- To get the update the contact list of Health facilities and Focal Points by camps.

#### During the deployment



- To support and facilitate CiCs and relevant government counterparts in the overall field coordination of the emergency response. These include assessment, information sharing with partners, rapid assessment or joint need assessment (JNA) and relocation of affected populations.
- Make key decisions of distributions within 12 hours of arrival with CiCs, partners and technical sector members.
- To coordinate closely with PERU team and protection focal points.
- To liaise with UNO, Army and other partners for the response in host community areas in the vicinity of the camps.
- Manage the overall emergency mechanism of Humanitarian Coordination Cell (HCC) with WFP and IOM.
- Provide incident report to Cox's Bazar before 1500hrs.
- Keep in touch with HCC leader and Teams as the focal point.

#### After the Deployment

- To follow up with Head of Units and HR to ensure the ERT members get the adequate CTO.
- To prepare operational input of after deployment review (What worked and what didn't? Why?).

### Changes in the ERT Operation due to COVID 19

Factoring Covid-19 situation during the monsoon, UNHCR ERT are now maintaining the minimum teams with rotation and standby teams for covering Ukhiya and Teknaf. The team objectives, modalities and team compositions are below:

#### Objectives:

1. To ensure minimal presence of Field and Site Management critical staff to monitor and follow up the ongoing monsoon emergency response in the most affected camps with partners.
2. To follow up and monitor the gaps and challenges of distribution of emergency shelters, repairs of essential services in landslide and flood affected areas with SM partners.
3. To monitor and follow up with partners on refugees staying in relocation sites
4. To ensure and continue regular field communication and interaction in the camp levels with different refugee volunteer groups SM partners and CiCs/ CiC's staff

#### Modalities:

1. Two teams consist of two vehicles per day for Ukhiya , one teams with one vehicle for Teknaf (camp 21, Omani site, camp 27, camp 26) and one mobile team to cover the gaps of the camps in Ukhiya and Teknaf.
2. Critical staff of ERT members that visit the camps will be rotated and support by standby team.

## ANNEX 7: Meetings with the partners to be planned

| Meeting's partners | Objectives  | Comments |
|--------------------|---|----------|
| HCR – IOM          | Agreement on the « One Camp » approach  |          |
| ISCG               | Adoption by all the sectors   |          |
| SMEP               | Agreement on the availability of equipment in case of disaster  |          |
| RRRC               | Approval of the approach by the government  |          |
| CiC and IP         | Communication with the camp management, governmental and IP   |          |
| Etc.               | Other meetings: <ul style="list-style-type: none"> <li>• Coordination with UNDP for new and potential temporary landfill plots</li> <li>• Communication with donors to avoid duplication of efforts</li> <li>• Pre-agreement with authorities / private on potential land use in case of temporary storage needs</li> <li>• Preparation with RRRC of the permit system to enter into the disaster zone.</li> <li>• .....</li> </ul> |          |

## ANNEX 8: Proposed further readings

The proposed links are functioning at the day of publishing (July 2021). When there is no links, documents are available on request.

### Legal framework

- 3R Forum Country Report Bangladesh UNCRD 2020  
[https://sdgs.un.org/sites/default/files/2020-11/UNCRD\\_10th%20R%20Forum\\_Country%20Report\\_Bangladesh.pdf](https://sdgs.un.org/sites/default/files/2020-11/UNCRD_10th%20R%20Forum_Country%20Report_Bangladesh.pdf)
- National 3R Strategy for Waste Management 2010  
<https://globalrec.org/wp-content/uploads/2014/03/Draft-National-3R-Strategy.pdf>
- River Management Improvement Project Ministry of Water Resources 2015  
<https://documents.worldbank.org/curated/en/123091468005126145/pdf/SFG1028-EA-P149734-RMIP-ESA-Box391452B-PUBLIC-Disclosed-05-13-2015.pdf>
- The Bangladesh Environment Conservation Act 1995  
<http://extwprlegs1.fao.org/docs/pdf/bgd42272.pdf>
- The Bangladesh Environment Conservation Amendment Act 2010  
<http://extwprlegs1.fao.org/docs/pdf/bgd167046.pdf>
- The Environment Court Act 2000  
<http://extwprlegs1.fao.org/docs/pdf/bgd42277.pdf>

### Solid waste management

- Recycling value chain analysis in Teknaf and Ukhia UNDP 2019  
[https://www.humanitarianresponse.info/sites/www.humanitarianresponse.info/files/2019/05/UNDP-RVCA-Teknaf\\_Ukhia\\_2019.pdf](https://www.humanitarianresponse.info/sites/www.humanitarianresponse.info/files/2019/05/UNDP-RVCA-Teknaf_Ukhia_2019.pdf)
- Sustainable Solutions to Solid Waste A local response to the Rohingya Crisis UNDP 2018
- A Review of Solid Waste Management Practice in Dhaka 2017  
<http://article.sciencepublishinggroup.com/pdf/10.11648/j.ijep.20170502.11.pdf>
- A study on solid waste generation in Dhaka-Bangladesh 2018  
<https://www.hilarispublisher.com/open-access/a-study-on-solid-waste-generation-of-household-and-potential-of-resource-recovery-in-dhaka-bangladesh-2165-784X-1000329.pdf>
- An in-depth review on municipal solid waste management in Bangladesh 2020  
<https://www.sciencedirect.com/science/article/abs/pii/S2210670719307061>
- Bangladesh Waste Database WasteConcern 2014  
[http://wasteconcern.org/wp-content/uploads/2016/05/Waste-Data-Base\\_2014\\_Draft-Final.pdf](http://wasteconcern.org/wp-content/uploads/2016/05/Waste-Data-Base_2014_Draft-Final.pdf)
- Community Based Solid Waste Management through Public-Private - Community Partnership WasteConcern 2006
- E\_E\_waste\_Management\_Sc 2010  
[https://www.academia.edu/8576454/E\\_E\\_waste\\_Management\\_waste\\_Management\\_Scenario\\_in\\_Bangladesh\\_Scenario\\_in\\_Bangladesh](https://www.academia.edu/8576454/E_E_waste_Management_waste_Management_Scenario_in_Bangladesh_Scenario_in_Bangladesh)
- GIZ Waste To Energy Guidelines 2017  
[https://www.giz.de/en/downloads/GIZ\\_WasteToEnergy\\_Guidelines\\_2017.pdf](https://www.giz.de/en/downloads/GIZ_WasteToEnergy_Guidelines_2017.pdf)
- Guidelines for e-waste management in Bangladesh ESDO 2012

- Managing Hazardous Wastes Country Inventory Report for Bangladesh ADB 2010  
<https://www.adb.org/sites/default/files/project-document/62596/38401-01-reg-tacr-01.pdf>
- Municipal solid waste Bangladesh 2007  
[https://applications.emro.who.int/imemrf/Iran\\_J\\_Environ\\_Health\\_Sci\\_Eng/Iran\\_J\\_Environ\\_Health\\_Sci\\_Eng\\_2007\\_4\\_2\\_67\\_76.pdf](https://applications.emro.who.int/imemrf/Iran_J_Environ_Health_Sci_Eng/Iran_J_Environ_Health_Sci_Eng_2007_4_2_67_76.pdf)
- Municipal solid waste management using GIS Bangladesh 2016  
[https://jpoll.ut.ac.ir/article\\_56943\\_56c9499a826a2b5445c976facacd7b6d.pdf](https://jpoll.ut.ac.ir/article_56943_56c9499a826a2b5445c976facacd7b6d.pdf)
- Municipal solid waste to energy Bangladesh 2016  
<https://downloads.hindawi.com/journals/jre/2016/1712370.pdf>
- Organic Solid Waste Management Bangladesh 2018  
[https://bids.org.bd/uploads/events/almanac2018/TS-4\\_P-1.pdf](https://bids.org.bd/uploads/events/almanac2018/TS-4_P-1.pdf)
- Organic Solid Waste Management Dhaka 2016
- Plastic pollution in Bangladesh  
<https://www.eeer.org/journal/view.php?doi=10.4491/eer.2020.535>
- Socially driven municipal solid waste composting Bangladesh WasteConcern 2012  
[http://www.iwmi.cgiar.org/Publications/Books/PDF/resource\\_recovery\\_from\\_waste-422-433.pdf](http://www.iwmi.cgiar.org/Publications/Books/PDF/resource_recovery_from_waste-422-433.pdf)
- Solid waste management in Dhaka Socio-economic analysis 2014  
<http://bv-f.org/08.%20BV%20Final.-13.pdf>
- Sustainable management scheme for academic Bangladesh 2014  
<https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.675.2241&rep=rep1&type=pdf>
- Sustainable use of plastic brick from waste PET Bangladesh 2019  
<https://link.springer.com/article/10.1007/s11356-019-06843-y>
- Sustainable waste management policy in Bangladesh for reduction of greenhouse gases 2017  
<https://www.sciencedirect.com/science/article/abs/pii/S221067071730149X>
- The prospect of biomass energy Bangladesh 2021  
<http://www.sapub.org/global/showpaperpdf.aspx?doi=10.5923/j.eee.20211101.01>
- Waste generation and management Bangladesh 2015  
[https://www.academia.edu/attachments/38412061/download\\_file?st=MTYyNjY4OTU0OCwyMDluNS40My4zNw%3D%3D&s=swp-splash-paper-cover](https://www.academia.edu/attachments/38412061/download_file?st=MTYyNjY4OTU0OCwyMDluNS40My4zNw%3D%3D&s=swp-splash-paper-cover)
- Waste Management Bangladesh Ministry of environment 2019  
[https://ccet.jp/sites/default/files/inline-files/1-3\\_Waste%20Mangement\\_Bangladesh.pdf](https://ccet.jp/sites/default/files/inline-files/1-3_Waste%20Mangement_Bangladesh.pdf)
- Waste Management in Bangladesh ISCA-IRJSS 2016  
<http://isca.in/IJSS/Archive/v5/i10/7.ISCA-IRJSS-2016-113.pdf>
- Waste to Energy GIZ - CWG 2016  
[https://www.giz.de/en/downloads/giz2016-en-cwg\\_Rapid-Assessment-Tool\\_Waste-to-Energy.pdf](https://www.giz.de/en/downloads/giz2016-en-cwg_Rapid-Assessment-Tool_Waste-to-Energy.pdf)

## Debris management

- National debris management guidelines UNDP Bangladesh v6 2015  
[https://www.humanitarianresponse.info/sites/www.humanitarianresponse.info/files/documents/files/undp\\_bangladesh\\_national\\_debris\\_management\\_guidelines\\_v6.pdf](https://www.humanitarianresponse.info/sites/www.humanitarianresponse.info/files/documents/files/undp_bangladesh_national_debris_management_guidelines_v6.pdf)
- Quick Guide post-disaster debris management UNHCR 2010  
[https://postconflict.unep.ch/humanitarianaction/documents/02\\_05-04\\_01-03.pdf](https://postconflict.unep.ch/humanitarianaction/documents/02_05-04_01-03.pdf)
- A numerical simulation of disaster waste disposal using DHT model 2021  
<https://www.geomatejournal.com/sites/default/files/articles/23-28-6155-Asai-April-2021-80.pdf>
- Preparing temporary storage site before a disaster 2021  
[https://jsmcwm.or.jp/international/files/2021/03/DWM\\_Lecture\\_TSS\\_before\\_disaster.pdf](https://jsmcwm.or.jp/international/files/2021/03/DWM_Lecture_TSS_before_disaster.pdf)
- Quantification of disaster waste - Review of the available methods 2021  
<https://reader.elsevier.com/reader/sd/pii/S2212420920314989?token=A0BE153CA59A5743FFA4BCAEBEA4CEE6001FAC645EB80E2D70FB12C97E9CBC776EB486F73CFFAC04AC11952105754865&originRegion=us-east-1&originCreation=20210719103402>

## Disaster response

- Bangladesh Disaster Management Handbook June 2017  
[https://reliefweb.int/sites/reliefweb.int/files/resources/disaster-mgmt-ref-hdbk-bangladesh\\_0.pdf](https://reliefweb.int/sites/reliefweb.int/files/resources/disaster-mgmt-ref-hdbk-bangladesh_0.pdf)
- Cyclone emergency preparedness update March 2020  
[https://reliefweb.int/sites/reliefweb.int/files/resources/cyclone\\_emergency\\_preparedness\\_update\\_-\\_march\\_2020.pdf](https://reliefweb.int/sites/reliefweb.int/files/resources/cyclone_emergency_preparedness_update_-_march_2020.pdf)
- Disaster management handbook 2020  
[https://reliefweb.int/sites/reliefweb.int/files/resources/disaster-mgmt-ref-hdbk-bangladesh\\_1.pdf](https://reliefweb.int/sites/reliefweb.int/files/resources/disaster-mgmt-ref-hdbk-bangladesh_1.pdf)
- Disaster management vision of Bangladesh Govt 2013  
[https://reliefweb.int/sites/reliefweb.int/files/resources/disaster-mgmt-ref-hdbk-bangladesh\\_1.pdf](https://reliefweb.int/sites/reliefweb.int/files/resources/disaster-mgmt-ref-hdbk-bangladesh_1.pdf)
- Emergency Flood Damage Rehabilitation in Bangladesh ADB 2011  
<https://www.adb.org/sites/default/files/publication/29114/responding-disasters.pdf>
- Emergency Preparedness Response Strategy UNHCR 2021  
[https://reliefweb.int/sites/reliefweb.int/files/resources/protection\\_sector\\_emergency\\_preparedness\\_and\\_response\\_plan\\_final\\_25\\_may\\_2021.pdf](https://reliefweb.int/sites/reliefweb.int/files/resources/protection_sector_emergency_preparedness_and_response_plan_final_25_may_2021.pdf)  
<https://www.humanitarianresponse.info/en/operations/bangladesh/camp-coordination-and-camp-management/>
- Disaster Management Based on Space Technology Ministry of Disaster Management and Relief Bangladesh 2014  
[https://www.adrc.asia/acdr/2014/documents/Session4\\_03\\_Ministry\\_of\\_Disaster\\_Management\\_and\\_Relief\\_Bangladesh.pdf](https://www.adrc.asia/acdr/2014/documents/Session4_03_Ministry_of_Disaster_Management_and_Relief_Bangladesh.pdf)
- National Plan for Disaster Management 2021-2025 Nov 2020 Draft  
[https://modmr.portal.gov.bd/sites/default/files/files/modmr.portal.gov.bd/page/a7c2b9e1\\_6c9d\\_4ecf\\_bb53\\_ec74653e6d05/NPDM2021-25%20DraftVer5\\_23032020.pdf](https://modmr.portal.gov.bd/sites/default/files/files/modmr.portal.gov.bd/page/a7c2b9e1_6c9d_4ecf_bb53_ec74653e6d05/NPDM2021-25%20DraftVer5_23032020.pdf)
- Scaling Up early Action Lessons Challenges and future potential in Bangladesh  
<https://odi.org/documents/5943/12641.pdf>



- Testing Front Line Solutions to Climate Disasters in Bangladesh ADB 2015
- International Disaster Response Law Fact Sheet Bangladesh IFRC 2017
- Standing Orders on Disaster 2010  
[www.ifrc.org/docs/idrl/883EN.pdf](http://www.ifrc.org/docs/idrl/883EN.pdf)
- Overview of Disaster Management in Bangladesh Ministry of Disaster Management & Relief  
[https://www.unescap.org/sites/default/files/Session\\_2\\_Bangladesh\\_Overview\\_of\\_Disaster\\_Management\\_in\\_Bangladesh.pdf](https://www.unescap.org/sites/default/files/Session_2_Bangladesh_Overview_of_Disaster_Management_in_Bangladesh.pdf)
- National Disaster Management System in Bangladesh  
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- Humanitarian collaboration and coordination in Bangladesh 3rd draft August 2020  
[https://www.humanitarianresponse.info/sites/www.humanitarianresponse.info/files/documents/files/humanitarian\\_collaboration\\_and\\_coordination\\_in\\_bangladesh\\_3rd\\_draft\\_24\\_august\\_2020\\_kazi.pdf](https://www.humanitarianresponse.info/sites/www.humanitarianresponse.info/files/documents/files/humanitarian_collaboration_and_coordination_in_bangladesh_3rd_draft_24_august_2020_kazi.pdf)
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## ANNEX 9: List of acronyms

| Acronym  | Meaning   |
|----------|---|
| AGD      | Age Gender Diversity                              |
| AoR      | Area of Responsibility                            |
| BDRCS    | Bangladesh Red Crescent Society                   |
| CBP      | Community-Based Protection                        |
| CFM      | Complaints Feedback and Response Mechanism        |
| CHW      | Community Health Worker                           |
| CHWG     | Community Health Working Group                    |
| CiC      | Camp in Charge                                    |
| COM      | Community Outreach Member                         |
| COVID 19 | severe acute respiratory syndrome coronavirus 2   |
| CP       | Child Protection                                  |
| CPP      | Cyclone Preparedness Program                      |
| CRI      | Core Relief Item                                  |
| CwC      | Communication with Communities                    |
| DC       | District Commission                               |
| DMC      | Disaster Management Committee                     |
| DMU      | Disaster Management Unit                          |
| DRR      | Disaster Risk Reduction                           |
| EPR      | Emergency Preparedness Response                   |
| EPWG     | Emergency Preparedness and Response Working Group |
| ERT      | Emergency Response Team                           |
| GBV      | Gender Based Violence                             |
| HCC      | Humanitarian Coordination Cell                    |
| HH       | Household   |
| IEHK     | Inter-Agency Emergency Health Kit                 |
| IOM      | International Organization for Migration          |
| ISCG     | Inter-Sector Coordination Group                   |
| JRP      | Joint Response Plan                               |
| MFT      | Multi-Functional Team                             |
| MOAS     | Migrant Offshore Aid Station                      |
| NFI      | Non-Food Item                                     |
| PB       | Participatory Budgeting                           |
| PDK      | Post Disaster Kit                                 |
| PERU     | Protection Emergency Response Unit                |
| PSEA     | Prevention of Sexual Exploitation and Abuse       |
| PWSN     | Persons With Specific Needs                       |
| RRRC     | Refugee Relief Repatriation Commissioner          |

|       |   |
|-------|---|
| SM    | Site Management                               |
| SMS   | Site Management Support                       |
| SMSD  | Site Management Site Development              |
| SoPs  | Standard Operating Procedures                 |
| SSL   | Solar Street Light                            |
| SUV   | Safety Unit Volunteer                         |
| TDK   | Tie-down Kit                                  |
| UNDP  | United Nations Development Programme          |
| UNHCR | United Nations High Commissioner for Refugees |
| UNO   | Upazila Nerbahi Officer                       |
| WASH  | Water Sanitation Hygiene                      |
| WFP   | World Food Programme                          |

**ANNEX 10: Some pictures of Dominica (Caribbean Island) after the hurricane Maria 2017**





















