



# NW SYRIA

## Environmental Country Profile for Shelter and Settlement

1<sup>st</sup> Edition | September 2023



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# NW Syria Environmental Country Profile for Shelter and Settlements

(September 2023)

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## Focus of the Profile

The document focuses primarily on information of use in the response to the two February 2023 SW Turkiye earthquakes. As these events affected an ongoing Shelter Cluster response, Shelter Cluster staff and partners already operating in the affected areas were able to redirect their capacities to the new priorities created by another disaster. As the immediate needs of the earthquake-affected areas were stabilized, a revision of the **Profile** to more specifically encompass environmental issues linked to the 12 years of conflict affected NW Syria can be expected.

## Suggested Further Actions

An Environment Profile is normally prepared before a disaster with links to pre-disaster planning and preparedness. The **NW Syria Environment Country Profile** has been developed during the response to the impact of two earthquakes in Turkiye.

As a result, a number of further actions to improve the integration of environment into the humanitarian response were identified. These actions are listed below as suggestions, recognizing that not all can be implemented immediately and there are external factors, particularly funding and partner capacities, which may hinder implementation.

**Section 4.2:** The Dignified Shelter & Living Conditions approach should include a specific environmental component, based on an assessment of environmental risks via, for instance, a NEAT+ assessment and specific actions to reduce these risks and improve impact. The Shelter Cluster strategy should incorporate natural hazard risk management beyond winter weather using a long-term approach.

**Section 6.2:** In the absence of formal legal procedures for the environmental review of project in NW Syria, humanitarian organizations should establish their own review procedures, particularly with regards to transitional and recovery projects which involve the built environment. Three procedures are detailed in Section 6.2.

**Section 7.1:** Shelter Cluster partners should confirm the presence of any protected areas in NW Syria and query locally about locations of unique environmental nature, including religious sites, burial sites and small forests or waterbodies. These sites, because they are often open access, can become dumps for waste and debris.

**Section 8.2:** The NW Shelter Cluster, in collaboration with other clusters, should conduct an online rapid environmental

impact assessment as the first step in identifying and prioritizing environmental issues related to the earthquake response. The rapid assessment should be complemented by field-level [NEAT+](#) assessments to identify and address operations-related environmental issues. (Also see Section 6.2.) Rapid and NEAT+ assessments will assist organizations in complying with Sphere Shelter Standard 7 and the ECHO project proposal environmental review requirement.

**Section 10.2:** Incorporate the results of impact assessment and management planning work (Sections 8 and 9) and indicators from the Shelter Cluster Tip Sheet into the development of HNO, HRP documents and NW Syria Shelter Cluster planning.

**Section 11.2:** When the IDP site verification process has been completed, the Cluster should cooperate with other stakeholders to establish a GIS database of sites to track changes to the sites and environmental impacts which may occur. The database will also be useful in tracking the potential or actual location of hazardous sites, e.g., small scale oil refining or dumps, near formal IDP sites.

**Section 12.2:** Future site planning work should integrate, to the degree possible,

remote sensing and GIS capacities described in Section 11.2.

**Section 15.2:**

- The Shelter Cluster should consider conducting environmental scorecard reviews of shelter constructed for earthquake and conflict displaces. The Global Shelter Cluster can provide guidance on this process.
- The Cluster should consider shifting to durable shelter materials, including the use of bolted metal frames and zinc roofs for shelters. These durable materials will require fewer replacements over time, reducing costs (and likely carbon footprints) and provide an asset which can be dismantled and moved when the occupants decide to move to another location.

**Sections 16.2 and 17.2:**

- The designs of stoves and fuels used should be assessed to identify potential reductions in fuel needs and stove efficiency,

including changes to shelter design to reduce lost heat.

- The impact of interior air quality should be assessed for the typical stoves and the way they are used.

**Section 18.2:** The NW Shelter Cluster should assess opportunities for reuse, repurposing, repair or recycling household goods, including white goods, from damaged buildings. These “4R” efforts would reduce a need for non-food item assistance by recovering such items from housing and provide livelihoods opportunities for cleaning and repairing the items recovered. A plan would also need to consider compensating property owners for items processed through a 4R approach if they do not receive the same or similar articles after the 4R activities.

**Section 19.2:** The Shelter Cluster should investigate the integration of DRR and NBS approaches into further work on dignified shelter and site improvements. The Global Shelter Cluster can assist in this effort.

# 1. Why this Environment Profile?

## 1.1. Using environmental formation to improve humanitarian response

In many cases, there is an abundance of information on the environment for most countries. However, following a disaster or crisis, humanitarian programs have limited time to find and analyze available information or integrate local or expatriate environmental experts into the response.

As a consequence, not using information on the environment can result in:

1. Humanitarian operations which worsen environmental conditions in providing aid,
2. Operations which may not take into account the laws of affected countries when providing assistance, and,
3. Opportunities for relief assistance to improve environmental conditions which are missed.

A result can be an increase in the harm experienced by affected populations and, in some cases, a need to provide additional assistance to address the environmental damage initially caused.

The **NW Syria Environment Country Profile for Shelter and Settlements** (hereafter, the **Profile**) provides a compilation of humanitarian-response related environmental information and analysis as a quick reference in planning and implementing lifesaving and life-supporting operations. Not all the information in the **Profile** will be needed by every humanitarian assistance organization. However, the wide range of material in the **Profile** is expected to enable humanitarian organizations to quickly access needed and useful information which would not otherwise be easily available.

The **Profile** has been developed as specific as possible to the NW Syria. However, some of the information provided may refer to Syria as a whole. This information may need to be confirmed as appropriate for NW Syria.

## 1.2. Development of the Profile

The **Profile** was developed based on a conceptual framework developed by the Global Shelter Cluster. The framework was modified to reflect the operations conditions in NW Syria, due to the earthquakes and the preceding situation with internally displaced populations.

The **Profile** was initially drafted by a disaster and environment consultant and then shared with the NS Syria Shelter Cluster for comment. While the preferred approach would have been a more directly collaborative development by the NW Syria Shelter Cluster, the process adopted was the best match to the operational conditions based on humanitarian organizations working in NW Syria following the earthquakes.

The initial version of the **Profile** is expected to be revised early in 2024, to reflect evolution of the humanitarian situation in NW Syria and changes in the need for and availability of environmental information. To this end, the NW Syria Shelter Cluster is expected to initiate the updating process as part of the development of humanitarian plans for 2024 through the Humanitarian Needs Overview, Humanitarian Response Plan and development of a Shelter Strategy.

## 1.3. Organization of the Profile

The **Profile** is divided into two main sections:

- A **Profile Overview** which generally provides:
  - Short topical summaries of information useful in incorporating environmental issues into the humanitarian response in NW Syria and,

- An identification of actions to be considered in integrating the environment into ongoing and future shelter and settlements operations.
- An **Annex**, which provides, where necessary, more information to complement the topical summaries provide in the **Profile Summary**.

**Key Environmental Focus Areas from the**  
[NW Syria Seismic Event Humanitarian Response Initial Key Environmental Guidance Overview](#)  
 Issue #1 - 14 April 2023; Reissued 5 May 2023

<ul style="list-style-type: none"> <li>● Real-time Environmental Assessments</li> <li>● Debris Management</li> <li>● Fire Safety</li> <li>● WASH</li> </ul>	<ul style="list-style-type: none"> <li>● Energy</li> <li>● Asbestos</li> <li>● Flood Risk Management</li> <li>● Procurement</li> </ul>
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See the [full overview](#) for more details.

## 2. Context

### 2.1. February 2023 Earthquakes

The **NW Syria XB Hub Update** for May 2023 can be found here: [https://sheltercluster.s3.eu-central-1.amazonaws.com/public/docs/SNFI\\_EQ\\_AdvocacyNote\\_May2023\\_v1\\_20230524.pdf?VersionId=daMsZRySgkwDaCGssuvQUOoQI6bEAoPd](https://sheltercluster.s3.eu-central-1.amazonaws.com/public/docs/SNFI_EQ_AdvocacyNote_May2023_v1_20230524.pdf?VersionId=daMsZRySgkwDaCGssuvQUOoQI6bEAoPd).

#### Situation overview

Source: [OCHA NORTH-WEST SYRIA Situation Report \(Last updated: 28 Apr 2023\)](#).

*The UN and humanitarian partners are continuing to respond to needs in north-west Syria driven by 12 years of conflict and the impacts of the earthquakes. More than half a million people have been supported with early recovery interventions including rehabilitation of key infrastructure, such as schools and health facilities, as well debris removal. Nearly 500,000 people in north-west Syria have been reached with multi-cash support, valued at US\$16.5 million, since the start of 2023. Some 90 per cent of these individuals received support after the earthquakes.*

*reported in north-west Syria according to the Health cluster. 43 per cent of the injured are women and girls. 20 per cent of the injured are children aged five to 14 years old. At least 148 communities in north-west Syria have been affected by the earthquakes. The districts with the highest number of deaths and injuries are Harim and Afrin. Some 1,100 deaths (a quarter of reported deaths) were recorded in Jandairis in the Afrin district. At least 10,600 buildings have been destroyed by the earthquakes at varying degrees (1,869 buildings have been completely destroyed and 8,731 buildings have been partially destroyed).*

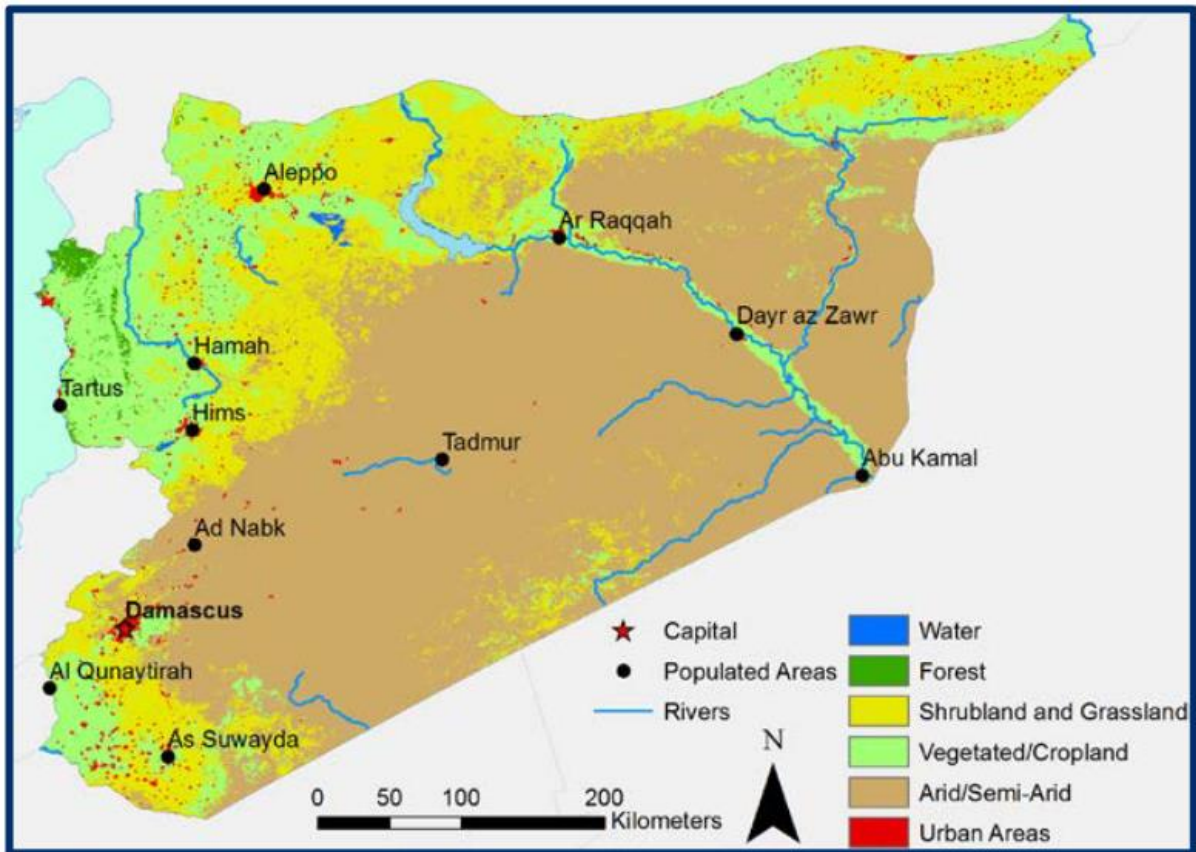
*More than 4,500 deaths and 10,400 injuries due to the earthquakes have been*

Also see **Section 5.4**, below.

### 2.1. Environment Overview

#### 2.1.1. Environmental Zones in Syria

Source: [CLIMATE CHANGE RISK PROFILE: Syria](#).



### 2.1.2. Current Environmental Context

Source: [Humanitarian Needs Overview Syrian Arab Republic](#) (issued December 2022)

#### **Environmental shocks<sup>1</sup>**

*Syria's geographical location in the eastern Mediterranean basin has made it vulnerable to climate variability and climate change-related impacts in recent decades. This situation is expected to continue or even worsen. ...*

*The Mediterranean region has experienced notable changes in drought and aridity, and is one of the global water stress hotspots. As climate change increases air temperatures, this exacerbates drought, and drives evaporation from soil, water reservoirs and rivers, transpiration and heat stress from plants, while simultaneously generating increased water demand. These conditions are projected to deteriorate further and the IPCC Sixth Assessment Report refers to a combination of climatic impact driver changes for the Mediterranean region.*

...

*Water scarcity will not eliminate the risk of flooding, and heavy precipitation events and pluvial floods are projected to increase. Other high-impact events expected to escalate in the region are fire risks, severe windstorms, coastal floods and coastal erosion.*

*The World Meteorological Organization (WMO) Mediterranean Climate Outlook Forum (MEDCOF) statements refer to the drier than average conditions in the last three years in Syria, particularly during the winter. It is important to note that it was during a drought situation that heavy rainfall, flooding and strong winds consecutively affected north-west Syria, first in January 2021 and again in the same month of 2022 (with heavy snowfall in some parts).<sup>10</sup> This highlights the importance of considering various weather and climate time scales for the*

<sup>1</sup> Numbers at the end of text refer to end notes in the original document.

anticipation, reduction and mitigation of impacts.

Severe drought is reported in many regions after successive months of failed rainfall. During the wet period<sup>11</sup> from October 2021 to May 2022, only March recorded normal to above-normal precipitation. Water deficits have been exacerbated due to drier than average conditions in the 2020/21 and 2021/22 wet seasons, but also by increasing evaporative demand associated with above-normal air temperatures during the July-September hot and dry season. According to Vegetation Health Index (VHI) products, the vegetation conditions have deteriorated since April 2022 and there was an intensification of drought in most of Syria. The situation in the first week of October 2022 was worse than during the same period of 2021 and VHI high-risk drought classes three and four prevail in large areas of the country.

Low rainfall in combination with low water levels reported in the Euphrates River also increase the concentration of biological and chemical contaminants. The impact on overall water quality both for domestic and drinking use increases public health risks.

....

Other study findings have highlighted that the average temperature has been rising

in north-east Syria and the region is now approximately 0.8°C hotter today than it was 100 years ago, with a decreased mean rainfall of about 18 mm per month per century. Despite agricultural input support to farmers, poor rainfall and climate-induced aridity have had a severe impact on wheat grain harvests and have caused cycles of wheat crop failures across north-east Syria. Climate change exacerbates the challenge of crop pests and diseases that reduce wheat crop yields and cause losses in wheat crop production.<sup>12</sup>

### **Risks related to environmental shocks**

In 2022 climatic and human-caused shocks affecting natural resources, particularly water, have intensified and exacerbated the humanitarian impact. Insufficient rainfall and historically low water levels in the Euphrates River have reduced access to water for drinking and domestic use for over five million people, in addition to substantial harvest and income losses, an increase in waterborne diseases, a cholera outbreak and compounded protection risks. A severe and long-term drought persists in Syria and poor vegetation conditions reflect several months of drier than normal precipitation seasons and above normal temperatures.

Also see [Country Environmental Profile for the Syrian Arab Republic](#). While dated in terms of environmental laws, it includes useful background information on the environment in Syria.

## **2.2. Shelter, Housing and Settlements Overview**

Source: [Considerations for a housing sector recovery framework in Syria](#)

### **Housing Types**

Existing housing typologies in Syria fall generally into three urban areas: formal, informal, and heritage. It is important to note that further distinctions can be found within formal (e.g., formal, or partially formal) and informal (e.g., informal but regulated, or informal insalubrious). Prior to the conflict, housing units could be found within the following CBS typologies: private apartments (36%), dense popular housing (19%), countryside houses (21%), Arabic traditional houses (18%) and 4% villas. The following overview of housing types is a hybrid of the CBS categorization and the Homs City categorization. (NB: Pictures removed.)

**Residential buildings** (Apartments Buildings): are usually built by contractors or contracting companies who then sell the apartments to individuals. The owners

of the land may build the buildings themselves, though this occurs on a limited scale. The sizes, number of apartments, number of floors, and the

quality of finishing vary from one neighbourhood to another, and from one city to another. Residential buildings are typically concrete structures with cinder block walls, consisting of 2-14 floors. They occur within both formal and informal areas.

**Arabic traditional houses:** traditional construction that usually consists of a courtyard with several rooms distributed around it, consisting of one or more floors. We found this type mainly in old cities (e.g. Damascus, Aleppo, etc.). Arabic traditional houses are typically stone structures with timber beam ceilings, consisting of 2 – 3 floors in most cases. They occur within formal areas.

**Countryside houses:** usually built by the landlord to accommodate their family. Countryside houses commonly consist of one or two floors. Countryside houses are typically concrete structures with cinder block walls, typically consisting of 2-4 floors. They occur within both formal and informal areas.

**Popular dwellings** (private and public providers): usually built by housing associations, where the land is bought, and houses are sold to the members of these associations in instalments. Apartments within popular dwellings are small, usually consisting of fewer than 100m<sup>2</sup>. Popular dwellings buildings are typically concrete structures with cinder block walls, consisting of 4-14 floors. They occur within formal areas.

**Villas:** detached or semidetached, usually luxurious, dwelling houses. Villas are

typically concrete structures with cinder block walls, consisting of 2-3 floors. They occur within both formal and informal areas.

**Agricultural House:** usually built by a farmer to accommodate them during farming season, or in some cases for the whole year. Agricultural houses usually consist of a basic and poor finishing. Agricultural houses are typically concrete structures, or, in some cases, built from stone. They typically consist of 1-2 floors and occur within both formal and informal areas.

**Baldeh:** occurring within the old core of the city, usually represented by attached (e.g., both side walls are shared with the next adjacent building) multi-storey heritage buildings with commercial space on the ground floor.

**Baldeh extension:** occurring within the heritage extension to the core, with detached multi-storey buildings, generally with commercial uses on the ground floor.

**New extension areas:** new urban extensions with multi-storey buildings, with residential on the ground floors, using various combinations of setbacks.

**Informal Settlements:** ... These informal settlements are typically found outside of urban areas subject to a Master Plan. They may also be found within Master Plan areas, where buildings do not comply with building regulations. In many situations this results in a horizontal or vertical patchwork of formality and informality.

### 3. Key Actors

Contact the NW Syria Hub for further information.

### 4. Summary of Shelter/NFI efforts

#### 4.1. Shelter/NFI Cluster (pre Earthquake)

Source: [Shelter/NFI Cluster Backbone North West Syria Shelter Cluster Strategy](#)

After eleven years of conflict, 4.4 million people in North West Syria live in siege-like conditions where there are acute shelter needs:

- 2.2 million people need shelter assistance.
- 800,000 people live in tents (90% of which are more than 1 year old).
- 1.7 million people live in 1,400 unplanned, self-settled IDP sites which lack access to services.
- 86% of sites are critically overcrowded.
- 58% of people living in IDP sites are children.
- 40 % of people living in NW Syria have a disability (53% of in-camp households have 1 member with a disability).
- 548,000 people accessed GBV services in 2021.

Poor quality basic shelter conditions, high rates of gender-based violence, and the impact of poor living conditions on children, the impact of climate change and natural disasters that make traditional approaches to shelter less effective.

Climate change means that recent winters have been extremely cold and wet with heavy snows, widespread flooding and sub-zero temperatures. Around 50% of current cluster expenditure is therefore focused on short term seasonal support to help people living in inadequate shelter to survive winter.

### **Dignified Shelter & Living Conditions**

In this context, both shelter and protection actors have identified a need to move to a

more adaptive and contextually suitable approach to humanitarian shelter. The Dignified Shelter & Living Conditions approach complements existing emergency response activities while identifying new shelter options for situations of protracted displacement.

Dignified Shelter & Living Conditions are more robust approaches to shelter and site improvement. The approach aims to upgrade unplanned self-settled IDP sites and promote inter-sectoral programming: Shelter, WASH, Early Recovery, Protection, and CCCM in particular.

...

### **Cluster Objectives & Strategic Response**

Objective 1: Provide life-saving and life-sustaining shelter and NFI support

- Emergency Shelter & NFI distribution
- Rehabilitation of damaged/unfinished buildings
- Winterisation
- Site improvement
- Advocacy for effective emergency response.

Objective 2: Contribute towards the resilience and cohesion of communities and households by improving housing and related community/public infrastructure.

- Dignified Shelter & Living Conditions
- Capacity development of cluster members
- Advocacy for investment in Dignified Shelter & Living Conditions.

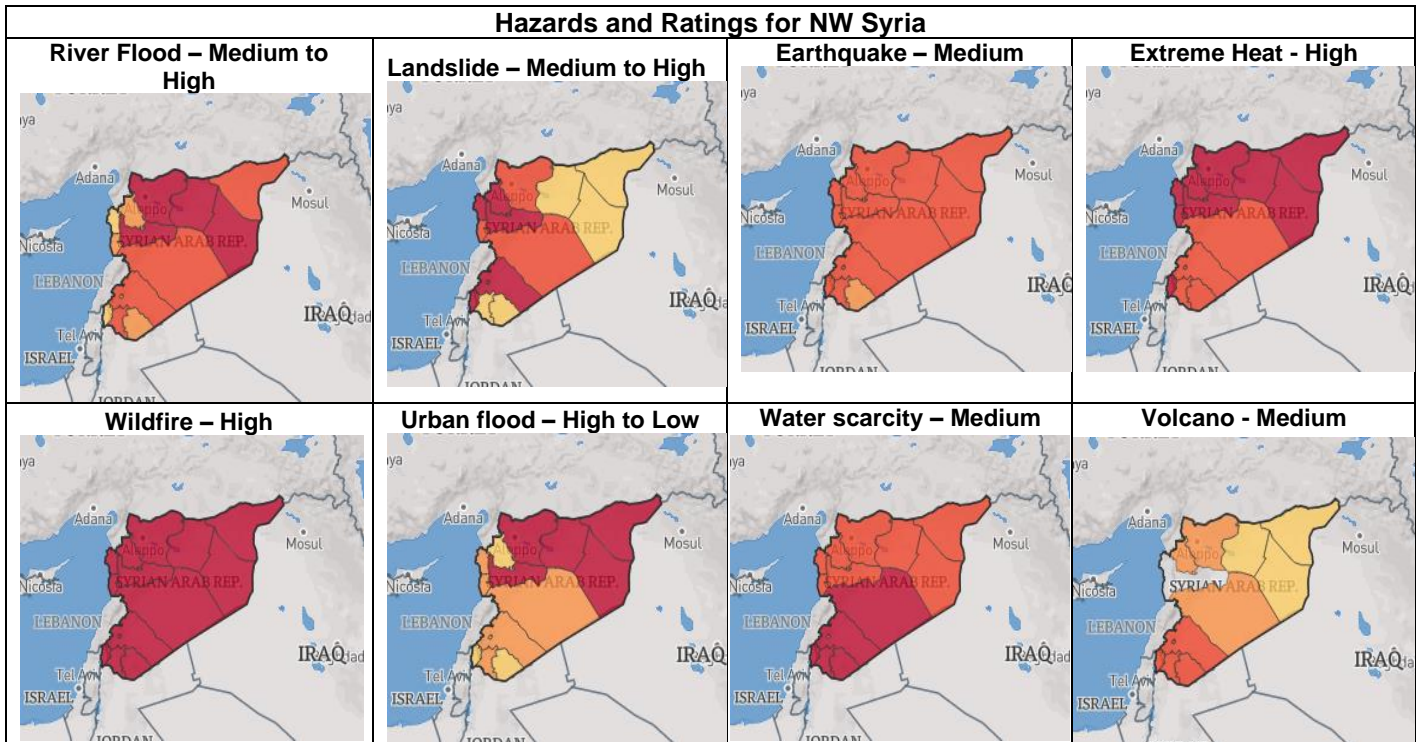
## **4.2. Suggested Further Actions**

The Dignified Shelter & Living Conditions approach should include a specific environmental component, based on an assessment of environmental risks via, for instance, a NEAT+ assessment and specific actions to reduce these risks and improve impact. The Shelter Cluster strategy should incorporate natural hazard risk management beyond winter weather using a long-term approach. (Most effective measures to reduce, for instance, flooding, require several years to be effective.)

## **5. Disaster Risk Management**

### **5.1. Natural Hazards**

The [ThinkHazard!](https://www.thinkhazard.org/) web site provides province-level summaries of natural hazards in Syria. The table and maps below provide the *ThinkHazard!* ratings for hazards identified as present in NW Syria. The full report, which includes more details on each hazard and larger maps, is available at <https://www.thinkhazard.org/en/report/238-syrian-arab-republic>.



In addition to the hazards listed above, winter weather is a significant life risk for people residing in NW Syria. A significant part of the threat arises from the nature of IDP shelter which is not designed or constructed for cold and snowy weather.

The winter weather threat is at a level where [winterization efforts are implemented on an annual basis](#). See the following sections in the [Guidance Note on the Shelter and NFI Response in North-West Syria](#) for more information: Shelter and NFIs Standardized Kits/Items Summary; Module 5.1 - Winter Top-up: Stoves and Fuel; Module 5.2 - Winter Top-up: Winter Clothing; Module 5.3 - Winter Top-up: NFI Winter Items and Module 5.4 - Shelter Winterization Activities.

These efforts now need to include the newly displaced as a result of the earthquake. Newly displaced who are now in emergency shelter will face different winter weather impacts from those experiences in their pre-earthquake shelter. Those able to return to pre-earthquake housing will be living in damaged buildings and face an increased threat from cold weather.

## 5.2. Climate Change

Source: [CLIMATE CHANGE RISK PROFILE: Syria](#).

### HISTORICAL CLIMATE

Key climate changes:

- Increased mean annual temperature at a rate of 0.8°C per century since the 1950s.
- Decreased mean rainfall of 18.23 mm per month per century.
- Increased autumn average monthly precipitation in the northern and central areas.
- Increased frequency, length, and intensity of droughts.
- Frequent heat waves during the spring and summer, resulting in temperature increases of 8-10°C above average. (7, 9)

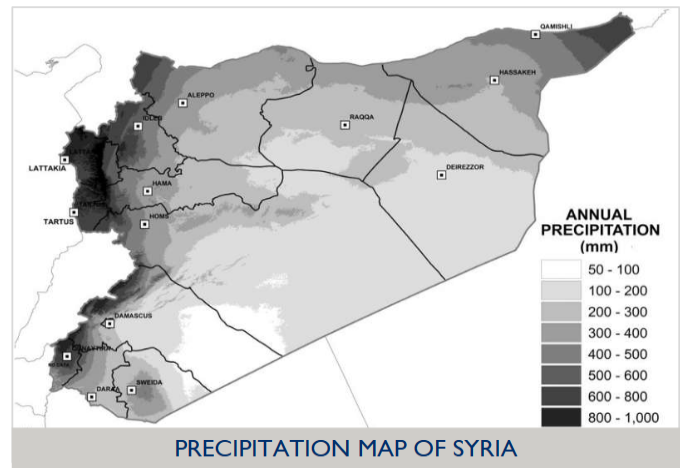
### FUTURE CLIMATE

Projected changes include:

- Increase in mean annual temperatures by 2°C by 2050.
- Decrease in precipitation by 11 percent by 2050.
- Decrease in runoff by 25-27 percent.
- Increase in the number of consecutive dry days by 5, and decrease in annual frost days by 13.
- Increase in frequency of dust storms and coastal flooding.
- Precipitation decrease most pronounced from September to November and from March to May. (7, 9)

## CLIMATE SUMMARY

Syria has four geographic zones: the Mediterranean coast in the west, mountains east of the coast, steppe east of the mountains and along the northern border, and desert in the southeast bordering Jordan and Iraq. The western Mediterranean coast has an annual average temperature of 18.1°C. Though Damascus can occasionally experience extreme cold and periodic snow, the Mediterranean coast tends to have cool rainy winters with hot dry summers. Data for annual temperatures, rainfall, and humidity are shown in the figure below and annual precipitation rate is displayed in the map to the right. (1, 7, 9)



Source: ICARDA, 2008 (5)

### 5.3. Disaster History

The table below lists the type and number of disasters recorded for Syria as a whole for the period from 1900 to 2023. The data is drawn from the [EM-DAT database](#).

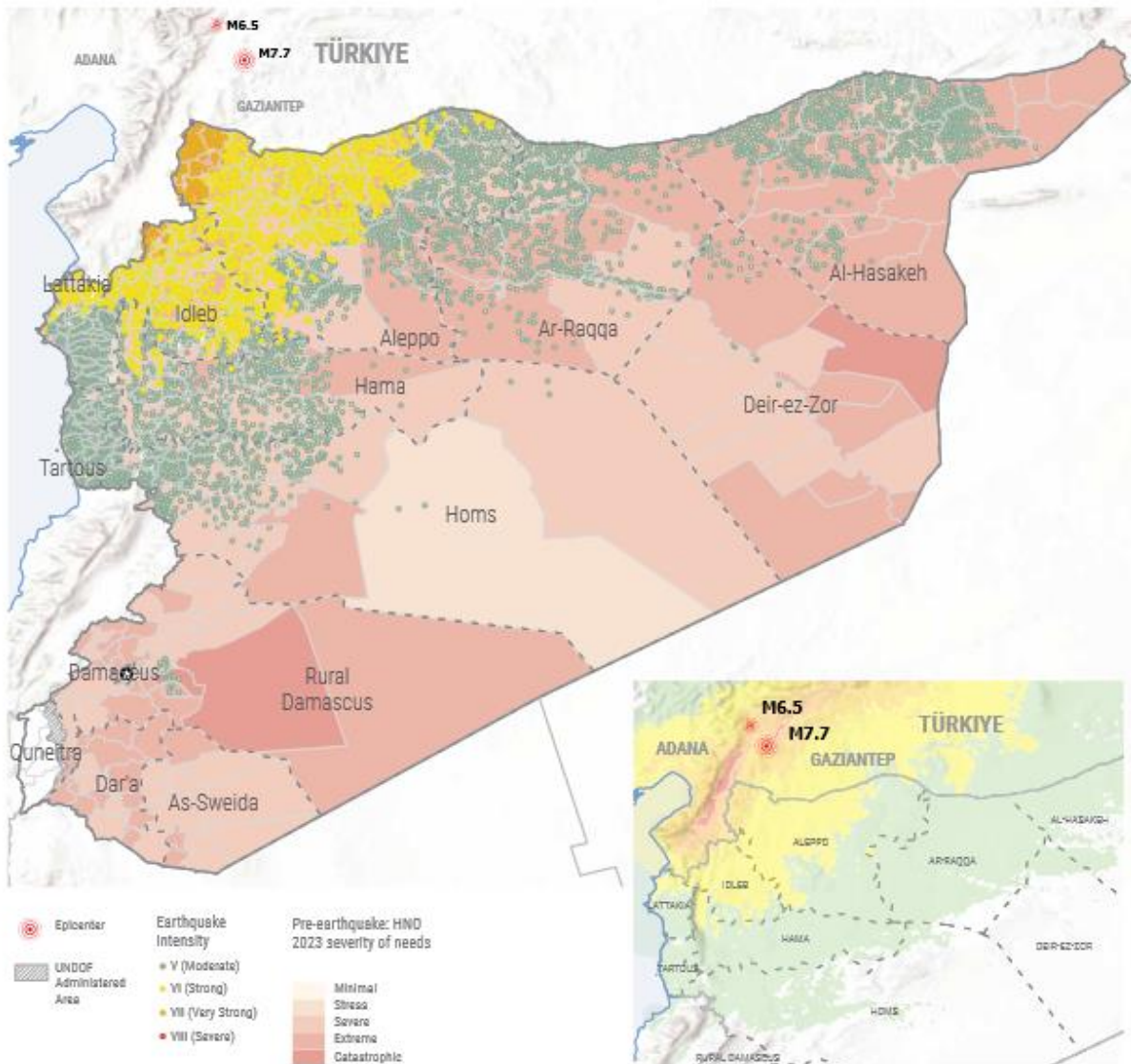
Disaster	#
Transport (Air, Ground, Water)	23
Flood	6
Epidemic	3
Earthquake	3
Drought	3
Convective storm	3
Collapse	3
Explosion	2
Convective storm	2
Wildfire	1
Landslide	1
Fire	1
Explosion	1
Chemical spill	1

## 5.4. Humanitarian Crisis

### 5.4.1. Earthquake Impact

Source: [Earthquake Needs and Response Overview Syrian Arab Republic](#)

As of 15 March, the 2023 Syria earthquake Flash Appeal, requiring US\$398 million to assist 4.9 million people, was funded at 64 per cent with \$256 million received. Despite a challenging operating environment, the humanitarian community has scaled up its response massively and continue to deliver life-saving aid and protection services to people in the most impacted districts in seven governorates. This document provides a comprehensive overview of needs, response, gaps and priorities for the remaining period of the Flash Appeal until May 2023 and is based on an analysis of needs assessments conducted to date.



### 5.4.2. Pre-Earthquake Conflict

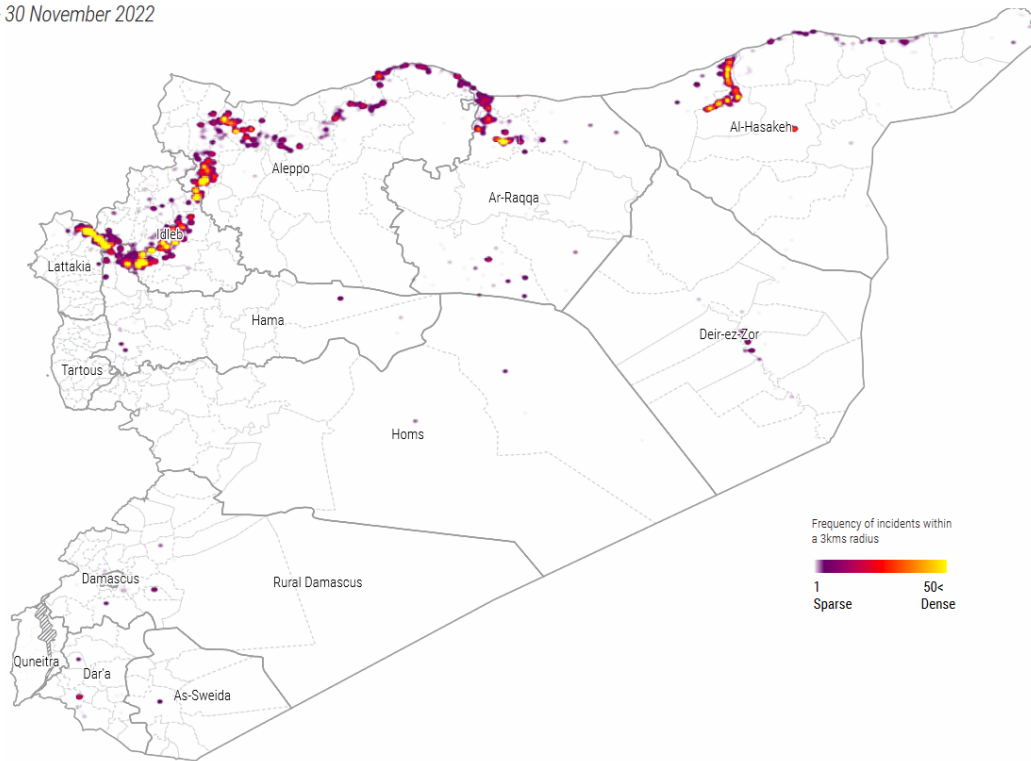
Source: [Humanitarian Needs Overview Syrian Arab Republic](#) (issued December 2022)

*In north-west Syria, active armed incidents and clashes are regularly reported around frontline areas and cause civilian casualties. In 2022, this continued to be the case in areas south of the M4 highway in Idlib Governorate, in areas north of Aleppo such as Tal Refaat,*

Afrin and around Ain Al Arab, Tal Abiad, Ain Eissa, Ras Al Ain and in Tal Tamer in northern Syria. Shelling in those areas has often led to the temporary suspension of humanitarian activities.

### Intensity of Incidents\* (shelling or air strikes)

January - 30 November 2022



\* Intensity is defined by the number of incidents in a specific area between January and 30 November 2022. The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations.

## 5.5. Disaster Management System in NS Syria

The disaster management system in NW Syria is understood to be ad hoc and based on national and international humanitarian organizations providing assistance during and after disasters. Some actions which reduce the likelihood of hazard events and disastrous impacts are included in the Shelter Cluster Dignified Shelter & Living Conditions effort, winterization assistance and advocacy for effective emergency response (see Section 4.1).

## 6. Environmental Regulatory Requirements and Institutions

### 6.1. Government Laws and Regulations

From [Syrian Arab Republic Nationally Determined Contributions Under Paris Agreement on Climate, November 2018](#):

*The new constitution (2012) in which stipulates that: "Protection of the environment shall be the responsibility of the state and society and it shall be the duty of every citizen".*

- *The Local Planning regulation (107/2011) gives the local units the tasks of achieving a balanced and sustainable development.*

- *The Regional Planning Law No. 26 (2010) adopts regional planning approach and contributes to support development across regions according to priorities and requirement.*

- *The Environment Law NO 12 (2012) established the rules of protection and preservation of environmental elements and its main components.*

An Arabic version of Law 12 (2012) can be found here:

<https://www.ilo.org/dyn/natlex/docs/ELECTRONIC/93210/108892/F-457653414/law%20no.%2012%20of%202012%20syria%20SYR-2012-L-93210.pdf>.

## 6.2. Alternative Procedures for NW Syria (Suggested Further Action)

In the absence of enforced formal legal procedures for the environmental review of project in NW Syria, humanitarian organizations should establish their own review procedures, particularly with regards to transitional and recovery projects which involve the built environment. Three procedures, detailed below in increasing order of complexity, are suggested to this end.

### Green Marker

All shelter-related projects included in flash appeals or humanitarian response plans should include a review of environmental considerations using a *green marker* approach. Under the Green Marker approach *Each humanitarian project should identify its potential impact on the local environment, and address it in a manner which is tailored to the specific country. Through simple coding A, B and C with a plus sign (+) for adequate enhancement or mitigation measures, the Environment Marker tracks a project's expected impact on the environment, and whether recommended actions have been undertaken or not. The tool is to be seen as a possibility to ensure that any negative impact on the local environment of a humanitarian project is reduced as much as possible.* Source:

<https://wedocs.unep.org/handle/20.500.11822/22138?show=full>.

The Green Marker form can be found at this link:

[https://wedocs.unep.org/bitstream/handle/20.500.11822/22138/Environmental\\_Marker\\_short\\_guidance\\_Sudan\\_2014.pdf?sequence=1&isAllowed=y](https://wedocs.unep.org/bitstream/handle/20.500.11822/22138/Environmental_Marker_short_guidance_Sudan_2014.pdf?sequence=1&isAllowed=y).

### NEAT+ Review

The Nexus Environmental Assessment ([NEAT+](#)) provide a means to screen for significant environmental issues during project design and to conduct quick field-level assessments to identify operational issues which may result in negative environmental impacts. NEAT+ comes in urban and rural versions and covers environmental sensitivity and Shelter, WASH, Food Security and Livelihoods activities.<sup>2</sup>

NEAT+-based assessments are one way to comply with ECHO requirements that project submissions include environmental reviews. In addition, NEAT+ provides a means for shelter assistance providers to comply with Sphere Shelter Standard 7 on environmental reviews. NEAT+ assessments can require an hour or less for each module, and the modules can be completed concurrently.

### Environmental Scoping and Assessment

For projects involving a significant use of natural resources, including sand, rock, water or earth (e.g., major building repairs, rebuilding or new buildings), an environmental scoping and assessment process is suggested. This process involves three steps:

1. Evaluating whether specific project activities, and specifically the natural and other resources used in the project, may have a significant negative impact on the environment (“scoping”).
2. Identifying impacts which can be managed through commonly used mitigation measures. These measures can be found in the environmental impact management plans developed for major infrastructure projects, as done by the World Bank or similar organizations.
3. Considering, where impacts are not expected to be manageable through common mitigation measures, how an activity can be reformulated to become mitigatable or use a different approach. If an activity cannot be mitigated, then consider environmental off-sets to reduce the overall negative impact on the environment, or canceling the activity.

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<sup>2</sup> Additional activity modules are being added.

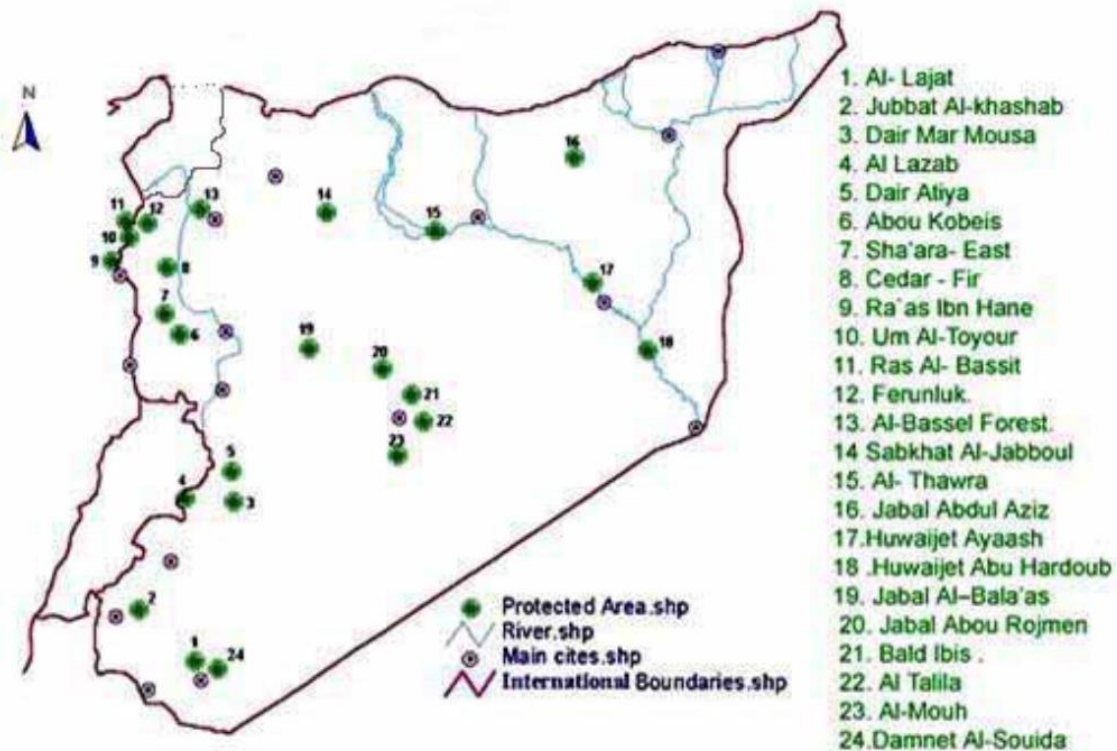
The first two steps in this process can take no more than a day. The third step generally involves reviewing and considering redesigns of project activities. The time needed for this process depends on the scope of the possible environmental damage identified and complexity of alternative options considered.

## 7. Ecologically Protected and Sensitive Areas

Reported reserves, protected areas and other environmentally unique sites in Syria are listed in the following table.

<b>Reported Reserves, Protected Areas and other Environmentally Unique Sites in Syria</b>		
(Source: Parks.It, <a href="http://www.parks.it/world/SY/Eindex.html">http://www.parks.it/world/SY/Eindex.html</a> .)		
<b>Nature Reserves</b>	<b>Protected Areas</b>	
Showla (Choula)	Abdul Aziz Mountain	Muzaireeb lake
Wadi el-Azib (Ghrib)	Abu Kubeiss	Quttina lake
<b>State Forests</b>	Abu Rejmayaen	Ras Al-Bassit
Froulok mountain	Aburejumain	Sabkhat al Jabboul
Lattakia	Achola	Talila
<b>Hunting Reserves</b>	Ad-Idami	Tell Hadya
Kassir al-Hir/Al-Gharbi	Al - Thawra	Um Al-Touyour
<b>Game Management Areas</b>	Al Balaas	Woz gol
Showla (Choula)	Al Bassit	Zabadani
Wadi el-Azib (Ghrib)	Al Furunlok	
<b>Other Protected Areas</b>	Al Orshani	
Hassia range center	Al Sha'ara	
Jabal Abou Rojmen	Al Shiha	
Kara Douran	Alawite Mountains	
Ra'as Ibn Hane	Al-Bassel Forest	
<b>Wetlands of International Importance (Ramsar)</b>	Arrawla	
Sabkhat al-Jabbul	Cedar - Fir	
<b>World Heritage Convention</b>	Dhumant Al Sweida	
Ancient City of Aleppo	Ferunluk	
Ancient City of Bosra	Ghab lake	
Ancient City of Damascus	Jabal Abdul Aziz	
Site of Palmyra	Khatounia lake	

The map below, from the [Country Environmental Profile for the Syrian Arab Republic](#), suggests that at least one protected area, Al-Bassel Forest, may be in the NW Syria Area of Operations.



The distribution of Nature Protected Areas in Syria.

### 7.1. Suggested Further Action

Shelter Cluster partners should confirm the presence of any protected areas in NW Syria and query locally about locations of unique environmental nature, including religious sites, burial sites and small forests or waterbodies. These sites, because they are often open access, can become dumps for waste and debris.

## 8. Rapid Environmental Impact Assessment

### 8.1. Rapid Assessment Summary

Based on a review of operational plans and experiences with similar disasters elsewhere, six potentially significant environmental issues may exist for the shelter and settlements response to the February earthquakes:

1. **Debris Management**, including the potential for using debris for reconstruction and reuse, repurposing and recycling.
2. **“Cash” Assistance**, including the impact on natural resources from shelter repairs or construction and the purchasing of items which have greater negative environmental impacts than items procured by humanitarian organizations. The issue here is not the scale of natural resource use for a single repair, but the cumulative impact of many (thousands?) of repairs.
3. **Shelter Assistance**, particularly as relates to the type and expected life of shelters provided and the need for a durable solution<sup>3</sup> for shelter needs given the time which may be required for owner-driven house repairs and rebuilding.
4. **Settlements Assistance**, as it relates to the provision of basic needs beyond physical shelter, e.g., to address WASH, education, health, food security, energy, etc. needs.

<sup>3</sup> Defined as shelters which will not degrade significantly over the time they are expected to be required as shelter, impose lowest possible impacts on the environment and are designed to preserve assets for owners.

5. **Livelihoods**, particularly as they relate to possible significant levels of owner-managed housing reconstruction.
6. **Natural Hazard Management**, as it relates to preparedness for flooding, severe weather and winter conditions for those newly resident in emergency shelter and reducing risks over the near and medium term as part of the rebuilding process (also to include populations in ad hoc housing before the earthquake).

## 8.2. Suggested Further Action

The NW Shelter Cluster, in collaboration with other clusters, should conduct an online rapid environmental impact assessment as the first step in identifying and prioritizing environmental issues related to the earthquake response. The rapid assessment should be complemented by field-level [NEAT+](#) assessments to identify and address operations-related environmental issues. (Also see Section 6.2.) Rapid and NEAT+ assessments will assist organizations in complying with Sphere Shelter Standard 7 and the ECHO project proposal environmental review requirement.

## 9. Environmental Management and Monitoring Plans<sup>4</sup>

### 9.1. Environment Management Plan (Suggested Further Action)

Until formal environmental reviews have been completed, it is suggested that the NW Syria Shelter Cluster develop a preliminary environmental impact management plan based on the issues identified in Section 8.1. Technical support from the Global Shelter Cluster is available for this effort.

### 9.2. Plan Monitoring

The management actions will be monitored as part of the regular Humanitarian Response Plan monitoring process based on indicators included in the HRP and Shelter plans.

## 10. Humanitarian Programming

### 10.1. Humanitarian Programming Cycle

As a conflict-impacted country, NW Syria goes through the annual Humanitarian Programming Cycle (see image at right). Further information on the HPC can be found at this link, including the current year guidance and templates:

<https://www.humanitarianresponse.info/en/programme-cycle/space>.

The Global Shelter Cluster has developed the [Shelter Cluster Tip Sheet for HRP Environment and Climate Change Mainstreaming](#) for use in integrating environmental considerations into the shelter component of the Humanitarian Response Plan (HRP). This process also includes consideration of environmental issues in the Humanitarian Needs Overview (HNO), on which the HRP is based. Materials and suggested actions provided in this **Profile** can be used as input into the HNO and shelter section of the HRP.



### 10.2. Suggested Further Actions

Incorporate the results of impact assessment and management planning work (Sections 8 and 9) and indicators from the [Shelter Cluster Tip Sheet](#) into the development of HNO, HRP documents and NW Syria Shelter Cluster planning.

<sup>4</sup> There are separate plans to manage impacts and monitor these activities.

## 11. Remote Sensing and GIS Data and Analysis to Enhance Humanitarian Shelter Programming

### 11.1. Overview

Extensive remote sensing work has been done on environmental issues in Syria. This work includes [Amidst the debris - a desktop study on the environmental and public health impact of Syria's conflict](#), and [Scorched earth and charred lives - human health and environmental risks of civilian-operated makeshift oil refineries in Syria](#).

The NW Syria Shelter Cluster does not currently use remote sensing or GIS capacities for assessments or assistance programming. The Cluster is undertaking an IDP site verification process with local authorities. Once this process has been completed a more formal use of remote sensing and GIS to map and monitor environmental and other aspects of IDP sites is possible.

### 11.2. Suggested Further Action

When the IDP site verification process has been completed, the Cluster should cooperate with other stakeholders to establish a GIS database of sites to track changes to the sites and environmental impacts which may occur. The database will also be useful in tracking the potential or actual location of hazardous sites, e.g., small scale oil refining or dumps, near formal IDP sites.

## 12. Site Selection and Planning

### 12.1. Overview

The NW Syria Shelter Cluster, as part of the IDP site verification process, is reviewing site selection results. It is anticipated that, with additional displaced due to the earthquake, site replanning and relocation will be necessary. Some training for this effort has already begun. Also see <https://sheltercluster.org/north-west-syria-hub/pages/site-planning-support>.

Annex 20.1 provides general guidance on site selection and planning from an environmental perspective. Additional modules from the [Green Recovery and Reconstruction Training Toolkit](#) can be useful in the site selection and planning process.

### 12.2. Suggested Further Action

Future site planning work should integrate, to the degree possible, remote sensing and GIS capacities described in Section 11.2.

## 13. Housing, Land and Property Security and Environment

Source: [Housing, Land and Property Rights in Shelter Due Diligence Guidelines](#)

(Note: Numbers at the end of text refer to end notes in the original.)

### **BACKGROUND AND AIM OF THESE GUIDELINES**

*These Guidelines are an adaptation of the Global Shelter Cluster "Land Rights and Shelter: The Due Diligence Standard" (2013) to the operational context of the Turkey x-border Shelter/NFI Cluster. The objective of the Due Diligence Guidelines is to support shelter actors in ensuring that Housing, Land and Property (HLP) rights of both shelter beneficiaries and land/property owners in Northern Syria are protected to the greatest extent possible throughout the shelter program cycle. A Due Diligence process also ensures accountability to beneficiaries and donors.*

...

### **Definition**

*HLP rights include the full spectrum of rights to housing, land and property held according to statutory or customary law or informally; both public and private housing,*

*land and/or property assets.<sup>2</sup> They include:*

- *Right to adequate housing,*
- *Right to access to natural resources,*
- *Right to security of tenure and protection against forced eviction, and*

- *Right to non-discrimination in accessing HLP rights.*

### **What does it mean to apply a Due Diligence Standard in Shelter Programming?**

*Due Diligence is a process of research, analysis and monitoring to ensure the protection of HLP rights throughout the shelter program cycle. This requires a double focus: 1) to identify and obtain the agreement of respective owner(s) of land and properties used for shelter interventions prior to any intervention, and 2) to provide the greatest degree of tenure security to beneficiaries feasible in the given context. A Due Diligence approach also ensures that vulnerable groups, especially women, are taken into consideration throughout. Failure to conduct Due Diligence not only risks significant HLP rights violations and the breach of humanitarian principles, but can also derail entire shelter interventions.*

*The uncertain security context in Northern Syria makes it extremely difficult to legally verify HLP ownership claims, a situation further complicated by the fact that many Syrians did not possess formal HLP documentation even before the beginning of the conflict. Much of the existing documentation has since been either lost, altered or damaged. Likewise, many property and land owners may not be present in the target community due to*

*displacement, imprisonment or loss of life. Therefore, proof of registered HLP ownership may not be available.*

*Recognising these challenges, the Due Diligence Guidelines aim to support x-border shelter actors to:*

- *Achieve as much legal certainty about HLP rights as is reasonable in the x-border context, taking into account existing constraints on access, resources and time;*
- *Reduce, as much as possible, the risk that x-border shelter programming causes or contributes to HLP disputes;*
- *Ensure that donor assistance is utilized in a way that protects rights and complies with Do No Harm principles.*

### **Scope and Structure**

*These Guidelines are intended for all Cluster actors engaged in the x-border shelter provision from Turkey, and are also relevant for all other interventions that raise HLP issues (e.g. in CCCM and WASH). The Guidelines focus on the following types of shelter interventions:*

1. *Shelter construction, covering both transitional (lifespan between 1-3 years) and permanent construction interventions;*
2. *Shelter repairs (private housing);*
3. *Shelter repairs (collective centres);*
4. *Shelter rehabilitation of unfinished buildings (private and public buildings); Household rental support.*

## **14. Site Decommissioning**

### **14.1. Overview**

The NW Syria Shelter Cluster has not yet been deeply involved in site decommissioning. However, capacities in this area may be required as part of the site verification process and any related site consolidation.

Information on site decommissioning can be found at these locations:

- **VEHA - Field Implementation Guidance: Decommissioning of sites and handover**, <https://ehaconnect.org/guidance/decommissioning-of-sites-and-handover>.
- **Environmental Perspectives of Camp Phase-Out and Closure: A Compendium of Lessons Learned from Africa**; <https://www.unhcr.org/afr/4a967ce69.pdf>.

## **15. Shelter Construction**

### **15.1. Overview**

For the earthquake-affected, the focus has been on immediate shelter needs and light repairs using cash (for supplies) and contractor (for supplies and repairs) modality. The

Cluster plans to engage a consultancy to provide guidance on the damage assessment process.

For more details on shelter assistance, see the following sections in the [Guidance Note on the Shelter and NFI Response in North-West Syria](#)

- Shelter and NFIs Standardized Kits/Items Summary
- Module 1.1 - Emergency Shelter
- Module 1.2 - Comprehensive Shelter Kit
- Module 2 - Minimum Basic Repairs
- Module 3 - New Arrival Kit/NFI Kit Containing Core Items
- Module 5.4 - Shelter Winterization Activities
- Module 6 - Monetization of SNFI Activities

Also see [Shelter Repair and Rehabilitation Guidelines](#) (draft).

Note that the longer (more durable) shelter materials are, less likely the overall impact on the environment due to repeated requirements to replace degraded materials. A comparison of durability and environmental impact can be best explored through the use of the scorecard approach (see Section 15.2).

### **15.2. Suggested Further Action**

- The Shelter Cluster should consider conducting environmental scorecard reviews of shelter constructed for earthquake and conflict displaces. The Global Shelter Cluster can provide guidance on this process.
- The Cluster should consider shifting to durable shelter materials, including the use of bolted metal frames and zinc roofs for shelters. These durable materials will require fewer replacements over time, reducing costs (and likely carbon footprints) and provide an asset which can be dismantled and moved when the occupants decide to move to another location. This shift can be incremental and be part of the process of addressing site-specific conditions (e.g., drainage, adjusting site plans, etc.).

## **16. Non-Food Items**

### **16.1. NFIs and Cash**

The NW Syria Shelter Cluster provides a range of NFIs, as well as uses a cash mechanism to meet some non-food and shelter needs. Details on NFI and cash assistance can be found in the following sections of the [Guidance Note on the Shelter and NFI Response in North-West Syria](#):

- Shelter and NFIs Standardized Kits/Items Summary
- Module 5.1 - Winter Top-up: Stoves and Fuel<sup>5</sup>
- Module 5.2 - Winter Top-up: Winter Clothing
- Module 5.3 - Winter Top-up: NFI Winter Items
- Module 6 - Monetization of SNFI Activities

### **16.2. Suggested Further Action**

- The designs of stoves and fuels used should be assessed to identify potential reductions in fuel needs and stove efficiency, including changes to shelter design to reduce lost heat.
- The impact of interior air quality should be assessed for the typical stoves and the way they are used.
- Local sources of environmentally friendly fuel sources should be identified.

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<sup>5</sup> This module included guidance on fire safety.

## 17. Key Considerations for Energy and Fuel

### 17.1. Overview

The most significant consideration for energy and fuel is in relation to the impact of winter weather. In general, energy in the form of bottled gas is not efficient for winter heating, with other sources (e.g., coal, wood) having possible negative environmental impacts from collection (e.g., wood) or indoor air pollution (wood, coal, liquid fuels, and in relation of inefficient stoves). In addition, shelter materials may not be effective for heat retention, and lead to an overall inefficiency in heating efforts. See the following sections in [Guidance Note on the Shelter and NFI Response in North-West Syria](#) for more in energy and fuel: Module 5.1 - Winter Top-up: Stoves and Fuel and Module 5.3 - Winter Top-up: NFI Winter Items.

### 17.2. Suggested Further Action

See Section 16.2.

## 18. Debris and Waste Management

### 18.1. Debris and Waste Management Overview

In the wake of the February earthquakes, debris management has been handled by the Early Recovery/Livelihoods Cluster in cooperation with NW Syria Shelter Cluster. It is understood that the focus of debris clearance is to removal debris which threatens lives and impedes the delivery of humanitarian assistance. Annex 20.2 provides a draft *Debris Management Plan for NW Syria* developed for UNDP.

Additional guidance on waste management is available from these sources:

- **Waste management in camp settings** can be found here: <https://resources.eecentre.org/resources/disaster-waste-management-guidelines-dwmg-online/different-types-of-waste/waste-in-displacement-camps/>.
- **Domestic waste** can be found here:
- **Hazardous waste management** can be found here: <https://resources.eecentre.org/resources/disaster-waste-management-guidelines-dwmg-online/different-types-of-waste/hazardous-waste/>
- **Medica/Biohazard waste** can be found here: <https://resources.eecentre.org/resources/disaster-waste-management-guidelines-dwmg-online/different-types-of-waste/healthcare-waste/>.

### 18.2. Suggested Further Action

The NW Shelter Cluster should assess opportunities for reuse, repurposing, repair or recycling household goods, including white goods, from damaged buildings. These “4R” efforts would reduce a need for non-food item assistance by recovering such items from housing and provide livelihoods opportunities for cleaning and repairing the items recovered. A plan would also need to consider compensating property owners for items processed through a 4R approach if they do not receive the same or similar articles after the 4R activities.

## 19. Disaster Risk Management and Nature-based Solutions

### 19.1. Overview

The NW Syria Shelter Cluster has not initiated specific disaster risk reduction (DRR) or nature-based solutions (NBS) for IDP sites. However, the dignified shelter approach together with site improvements in some locations provides a basis for expanding DRR and NBS efforts.

### 19.2. Suggested Further Action

The Shelter Cluster should investigate the integration of DRR and NBS approaches into further work on dignified shelter and site improvements. The Global Shelter Cluster can assist in this effort.

## 20. Annexes

### 20.1. Site Selection and Planning

The following site selection text is adapted from **Strategic Site: Selection and Development**, Green Recovery and Reconstruction: Training Toolkit for Humanitarian Aid, WWF US and the American Red Cross (<https://envirodm.org/green-recovery/module-4/>).

#### Basic Principles

##### Recognize the context

Site selection and development should consider the broader social and physical setting of the proposed intervention. Site selection/development should be avoided where social conflict may arise between old and new residents, or where there will be conflicting or, eventually, excessive demands on natural resources.

##### Treat ecosystems as interdependent and interconnected

Post-disaster shelter site development does not occur independently of the natural environment. The ecosystems surrounding a prospective site may serve to mitigate hazard impacts (e.g., forested slopes reducing flooding) and provide livelihood resources and public amenities.

##### Promote existing landscapes

The site design and construction process should start with landscape mapping<sup>3</sup> prior to site clearance. The resulting data should be used to the extent possible to integrate site plans into the natural landscape rather than to re-engineer the natural landscape to fit the site and to maintain as much of the natural vegetation and habitats as possible.

##### Include environmental restoration as part of site design

For a variety of reasons, land with little economic or environmental value is often seen as the first option for post-disaster shelter reconstruction: Good land tends to go to the highest bidder, leaving the poorer, more vulnerable residents with the more hazard-prone sites. Proactive site development can re-house disaster survivors while restoring the environment of a degraded location.

##### Restore sites after construction

Whether from the increase in the number of people in a location or from the construction efforts associated with the building of houses, roads, and other infrastructure, resettlement can have profound, negative impacts on the

environment. All site-related interventions should incorporate components to restore disturbed environments to pre-project conditions where possible. These efforts should include areas from which natural resources have been extracted (e.g., borrow pits, logging sites) and the clearing and restoration of construction sites (e.g., restoring cement mixing areas, materials storage areas, vehicle maintenance yards).

#### Site Selection and Design Considerations

##### Capacity

- The number of people at a new site will not result in resource requirements that unsustainably exploit locally available natural resources.
- Density
- The density of habitation of the new site will not be greater than it was where the inhabitants lived before the disaster.
- The density of habitation of the site meets local regulations or international best practice.

##### Climate

- The site plan incorporates measures to address current and expected climatic conditions.
- The potential for negative changes to local climate, such as changes in rainfall or frequency of severe storms, has been considered in the site plan.

##### Slope

- The slope of the land on the site does not exceed 5%.

##### Cultural significance

- The cultural, historical, political, and social significance of locations at or near the proposed site have been considered as part of the site selection and plan development process.

### Vegetation

- The retention of vegetation has been maximized in the site plan.
- Indigenous vegetation with economic value [such as fruit trees], is maintained or reintroduced at the site.
- The planting of nonnative plants has been avoided or minimized.

### Hazards

- A hazards assessment for the site has been conducted and mitigation plans have been developed.
- The hazard assessment covers both natural and technological hazards.
- Mitigation plans incorporate structural (e.g., flood walls), nonstructural (e.g., warning systems), and ecological (e.g., maintenance of natural floodways) measures.

### Construction methods and materials

- Construction methods minimize negative environmental impacts.
- Building designs reduce energy requirements for heating or cooling.
- Construction methods rely on locally available skills and competencies, and take into account the need to introduce new methods to reduce disaster risk or increase sustainability.
- Methods to reduce disaster impact are incorporated into site and building design.
- The use of locally available materials for construction does not place unsustainable demands on the local supplies of these materials.

### Drainage

- The drainage plan is based on projected maximum daily precipitation as well as consideration of future climate impacts.
- Raised areas that can provide safety from possible floods have been established for humans, their possessions, and domestic animals.

- The permeability (i.e., ability of the soil to absorb water) of the site is maximized to reduce runoff.
- Unpaved areas are established to reduce flooding and to increase soil absorption of water.
- Warning systems are established for potential flood events.

### Livelihoods

- The new site is close to the location of normal livelihood activities, and enables residents to pursue these activities without significant additional cost or difficulty when compared to the precrisis situation.
- Adequate space has been provided for livelihood activities at the household and community levels.
- Markets include sufficient water supplies and space and facilities for adequate sanitation and the handling of waste.
- Waste from markets and other commercial sites is recycled.
- Composting is used to add value to organic waste.
- There is adequate space between the location of economic activities and living and social areas, such as schools to decrease the impact of noise, air, and water pollution.
- All markets have adequate water supply, drainage, and waste-handling facilities.

### Utilities (water, energy, waste)

- Sufficient space is available for water, energy, and solid and liquid waste utility services.
- The growth of demand for water, energy, and solid and liquid waste utility services is incorporated into site plans.
- Utility networks are easily accessible and, where appropriate, integrated into green spaces.
- Storage areas for wood, coal, or other similar energy sources are available and limit fire hazards and the impact of pollution.
- Rainwater harvesting is used to reduce demand on surface or groundwater resources.

- Grey water is recycled where possible.
- Low-volume toilets are used where appropriate.
- Flow-limiting faucets are used for communal water sources (e.g., stand pipes).
- Environmentally beneficial and appropriate technologies (e.g., solar panels, solar cookers) are used to limit demand from other sources of energy.
- Solar cookers/water heaters and/or fuel-efficient stoves are used to reduce the demand for carbon-based fuels for cooking and heating.
- The types of toilets used reduce sewage production (e.g., composting toilets) and groundwater pollution (e.g., use of closed-box septic tanks).
- Sewage collected through septic system cleaning (e.g., pumping of latrines) or through piped systems receives tertiary treatment.
- all solid organic matter collected through sewage systems is composted and reused to improve soil quality (e.g., in agriculture, to support tree planting, or to restore areas of natural vegetation).
- Solid waste is recycled and organic waste composted and used to improve soil quality.
- The area allocated to landfills meets the expected future waste outputs of the site and is designed to meet appropriate sanitation and pollution-control standards.
- The need for landfill space or waste incineration is reduced through the practice of recycling, including composting for commercial or communal uses.
- Local laws, international standards, and best practices are followed in the development of waste management systems.
- Pricing is used to reduce resource demand, taking into account basic rights to water and local expectations of entitlements to water and energy resources.

#### Site access

- The site is not physically isolated from road networks, towns, and markets.
- There are adequate roads and access within the site.
- Roads/paths within the site follow the contours of the site where possible, and steep roads/paths are avoided.
- Crossings of water courses are designed for maximum flows, and include pedestrian passages for use during periods of high water.
- Road surfaces limit dust and water erosion.
- Roads have adequate drainage to prevent flooding and surface erosion.
- Space is provided along roads for pedestrian traffic and for bicycles and motorbikes or carts, where these are a major means of transportation.
- Vegetation, indigenous if possible, is used to stabilize slopes and road shoulders.

#### Public space lighting

- Public lighting is designed to minimize energy and maintenance requirements.

#### Household-level agriculture

- Space is provided for kitchen gardens or small truck farms (as per local custom).
- Rainwater and/or grey water are used for household-level agriculture.
- Kitchen and other organic waste are recycled as compost or, in the case of food waste, as animal feed.
- Waste from household livestock is properly managed, including composting, and odors, as well as air and water pollution, are limited to the extent possible.

#### Wildlife

- The impact of the site on wildlife populations has been assessed.
- The potential for conflict between wildlife and livestock has been assessed and addressed.
- The site is not in a wildlife transit corridor.

### Pest management

- Pest breeding sites have been limited in the location and design of the site.
- The need for chemical pest control has been limited through site design and location.

### Wind

- Wind directions, including seasonal variations, have been plotted for the site.
- Roads and building direction take into account prevailing winds to provide good ventilation for the site.
- Doors and windows are positioned to limit the impact of winds considered unpleasant.
- Roads are designed to break the flow of the wind.
- In areas of potentially high winds (from thunderstorms, monsoon fronts, etc.) or heavy snow, roof slopes are 1:4 unless other structural measures are taken to limit the potential for wind or snow damage.
- The siting of the building should reflect consideration of the local wind conditions.

### Sun

- The sun track across the site has been plotted.
- Buildings are oriented to limit or promote solar heating as needed.
- Building design incorporates the need for shade to offset roof heating
- Options for solar water heaters have been investigated and heaters used where appropriate.

### Rainfall

- Precipitation data is used in the design of roads, housing, and drainage.
- Rainwater catchment systems at the household or community level are based on precipitation data and the seasonality of rainfall.
- In areas of heavy rainfall, vegetation is used to slow runoff and is complemented by retention ponds.

- Precipitation data should be used in the design of roads, housing, and drainage. Rainwater catchment systems at the household or community level should be based on precipitation data and the seasonality of rainfall.
- Where rainfall can be heavy, vegetation should be used to slow runoff and be complemented by retention ponds (which can themselves be used for aquaculture.)

### Topography

- The settlement is designed to match the existing topography; the location and orientation of roads, housing blocks, and community structures have been adjusted to fit the form of the land.
- Discussions on the disadvantage of a block-grid approach to site selection have taken place, and alternatives developed as financially and socially feasible.

### Geology/soils

- The permeability, structure, and composition of the soil and geology of the site have been assessed.
- The site does not include rocky areas and is not located on rocky terrain.
- The site plan should consider the permeability of the soil and geology of a site, and, in particular, the following elements:
  - Liquid waste disposal
  - Revegetation
  - Drainage
  - High ground water

### Aquatic ecosystem

- The sustainable use of aquatic ecosystems has been incorporated into the site selection.
- The risk of pollution of aquatic ecosystems from the site has been limited.

### Vegetation

- Vegetation should be retained to the greatest degree possible during site development. Where clearing is necessary, trees should be retained as a priority and trees with

- economic or food value should be accorded top priority.
  - Landscaping has been provided to improve the visual characteristics of the site.
- Visual characteristics
- The visual characteristics – the look – of the site have been

## 20.2. Draft Debris Management Plan – NW Syria

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#### 1. What is Debris Removal?

'Debris' is generated from damaged buildings and structures and includes building materials, furnishings etc. It is not 'waste' that arises from the daily lives of households, markets, offices, industrial and commercial premises and public sector offices.

Typical debris in Syria from damaged buildings and infrastructure comprises concrete, masonry bricks, building stones, tiles, reinforcement bars, timber, doors and window frames, pipes and tanks, electrical wires and cables, glass as well as furniture and fixtures.

Caution also needs to be taken with the handling of debris since it can pose a health risk to debris workers and general public if it is mixed with hazardous wastes such as asbestos, oils and chemicals. In addition, there is a high probability of Un-Exploded Ordnance (UXO) being found in the debris where robust procedures are to be developed for the identification and subsequent management of such UXO.

Note that these guidelines do not cover the demolition of buildings damaged by the hostilities but rather the guidelines focus on the *handling and management of the debris from collapsed buildings*.

For all types of debris though, there will be a proportion of the following composition to varying ratios:

- Concrete, both as cast concrete, reinforced concrete as well as concrete blocks and elements;
- Bricks largely as masonry bricks from buildings as well as roofing tiles of same materials;

- *Rocks/Stones* typically as rough cut stones used in the walls of buildings for example basalt stone in Homs;
- *Vegetation* from damaged and uprooted trees, agricultural crops, bushes and other green waste;
- *Wood* from structural timbers as well as internal paneling and furnishings;
- *Asphalt* from hardstanding areas within the plot of the building or structure as well as roads;
- *Soils*, excavations in connection with the clean-up and demolition works. Included in this category are also building materials such as mudbricks and adobe;
- *Plaster* from coating of the walls and often mainly of gypsum;
- *Metals* such as reinforcement bars, structural steel and metallic structures such as tanks and industrial plant;
- *White goods* such as fridges, freezers, cooking ovens etc.
- *Electronic* wastes such as TVs, stereos, computers;
- *Furnishings*, internal general wastes which includes paper, cardboard plastics, glass etc;
- *Personal belongings* from homes, offices and industrial sites;
- *Cars and other mobile items* which have been damaged and left behind;
- *Industrial wastes* such as fuel, chemicals, solvents and other hazardous materials, substances and wastes from damaged industrial and commercial plant; and,
- *Human and animal corpses*.

## **2. Key Objectives with Debris Management in Recovery**

The key success criteria for effective debris management in a recovery situation typically include:

- ✓ 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;
- ✓ Removal of damaged building and structural elements (i.e. unstable walls) and debris piles which pose an immediate threat to the public;
- ✓ 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 life time 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.

## **3. 1st Actions**

The following are typical immediate actions in debris management:

- Disseminate safety awareness to returning residents on risks of entering damaged buildings and handling debris
- Damage assessments and community consultations to inform where to start the debris removal
- Identify appropriate debris disposal and solid waste disposal areas as approved by the local authorities

- Implement clear UXO/IED procedures for the debris removal workers
- Clear (critical) access routes for emergency services, humanitarian supplies, repair of critical utilities and safe access for returning home & business owners
- Emergency demolitions of unstable buildings to reduce risk to public health
- Start with public service buildings, such as schools and clinics, once approved by the local authorities
- Determine legal procedures for debris removal and demolition works of private buildings

#### 4. Debris surveys

To inform the planning and implementation of debris removal works a site survey is required. This will enable:

- A scope of work to be prepared
- Determine how much debris will be removed and thus help locate where the debris can be disposed of
- Identify any current access issues for the works

How are damage assessments and surveys done:

- Satellite image analysis of before and after as well as height of buildings
- Ground truthing with site visits

*Note that this does not need engineering skills at the high level assessments*

#### **For each target area then split into segments/grids/roads**

##### *Physical Description*

- Photos of the grid from each corner looking into the grid
- Short description of the debris removal requirements and estimate on quantities
- Short description of emergency demolition requirements with resulting debris quantities
- Any known UXO constraints?
- Any access issues or other hindrances

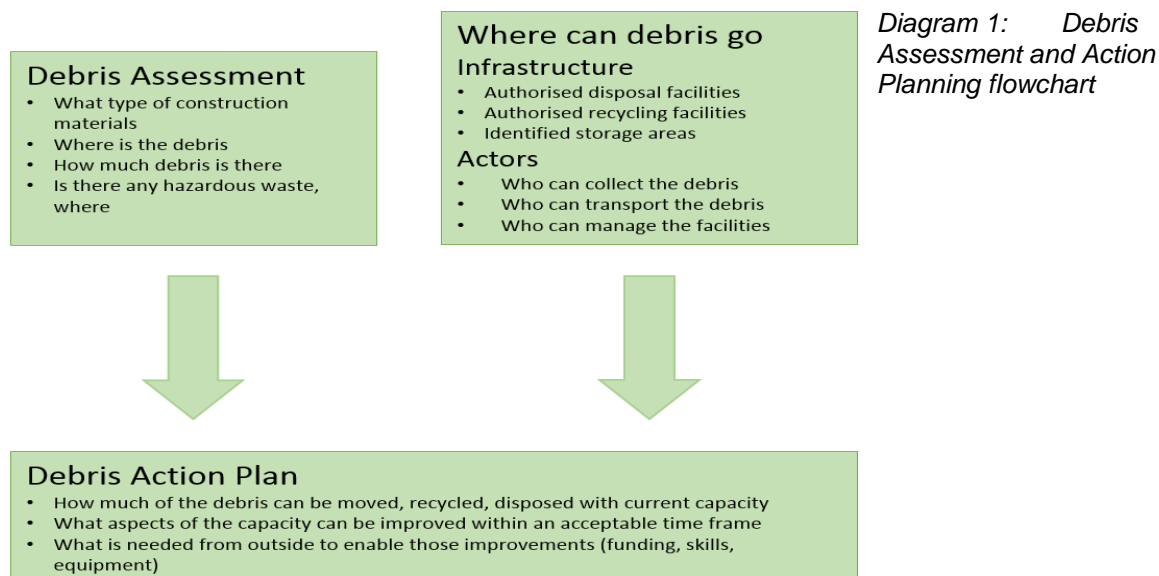
##### *Access*

- Confirm access to the whole area is possible with heavy plant and machinery, i.e. roads and bridges are accessible to get to the area

##### *Safe Utilities*

- Confirm whether utilities and services in the area are live or dead and take measures to isolate power, gas and water in areas of operation so no risks to debris and demolition workers

An overview of the main steps in carrying out a debris assessment are included in the below flowchart.



## 5. Priorities for Debris Removal

Priority	Description of Priority	Debris Comment
1	Removal of debris from critical facilities and services such as hospitals, fire stations etc. to enable access.	Handling requires attention to Health and Safety for the workers. The site for dumping of the debris should be selected with consideration to future use of the land on which dumped (i.e. not to dump debris on someone's agricultural land)
2	The removal of damaged buildings and infrastructure which could cause an immediate threat to public safety such as unstable structures and large piles of unstable debris in urban, residential areas	Handling requires attention to Health and Safety for the workers. Site for dumping of the debris as for Priority 1.
3	To remove uncontrolled dumped debris from urban areas since if left to lie will often attract dumping of general wastes (which will reduce opportunity to recycle the building waste), which in turn can lead to public health and environmental risks.	Handling requires attention to Health and Safety for the workers. Site for dumping of the building waste as for Priority 1.
4	Remove debris from streets, roads and public rights of way to enable return of affected communities to their damaged properties.	Handling requires attention to Health and Safety for the workers and there may be an opportunity to sort the wastes into recyclables before transport.
5	To remove debris of damaged buildings from private and public plots of land to enable reconstruction.	Handling requires attention to Health and Safety for the workers and there may be an opportunity to sort the wastes into recyclables before transport.

*Table 1: Typical priorities for debris in Early Recovery with handling comments.*

The actual selection of priority is dependent on the specifics of the recovery situation and will need to take into consideration aspects such as reducing public health risks, access requirements, availability of plant and equipment, time and resource constraints as well as knowledge of relief efforts in debris handling.

## 6. Authorisations

Getting the right authorisations to remove debris is a key step in debris management. There are 3 main debris related approvals needed:

1. Authorisation for removal of debris from public roads, streets, spaces and buildings which can be gained from the local or City authority.
2. Approval for removal of debris from a private plot typically requires the approval of the owner including documentation that the owner is indeed the owner.
3. Approvals for the site to which the recyclable debris and waste (non-recyclable debris) is taken.

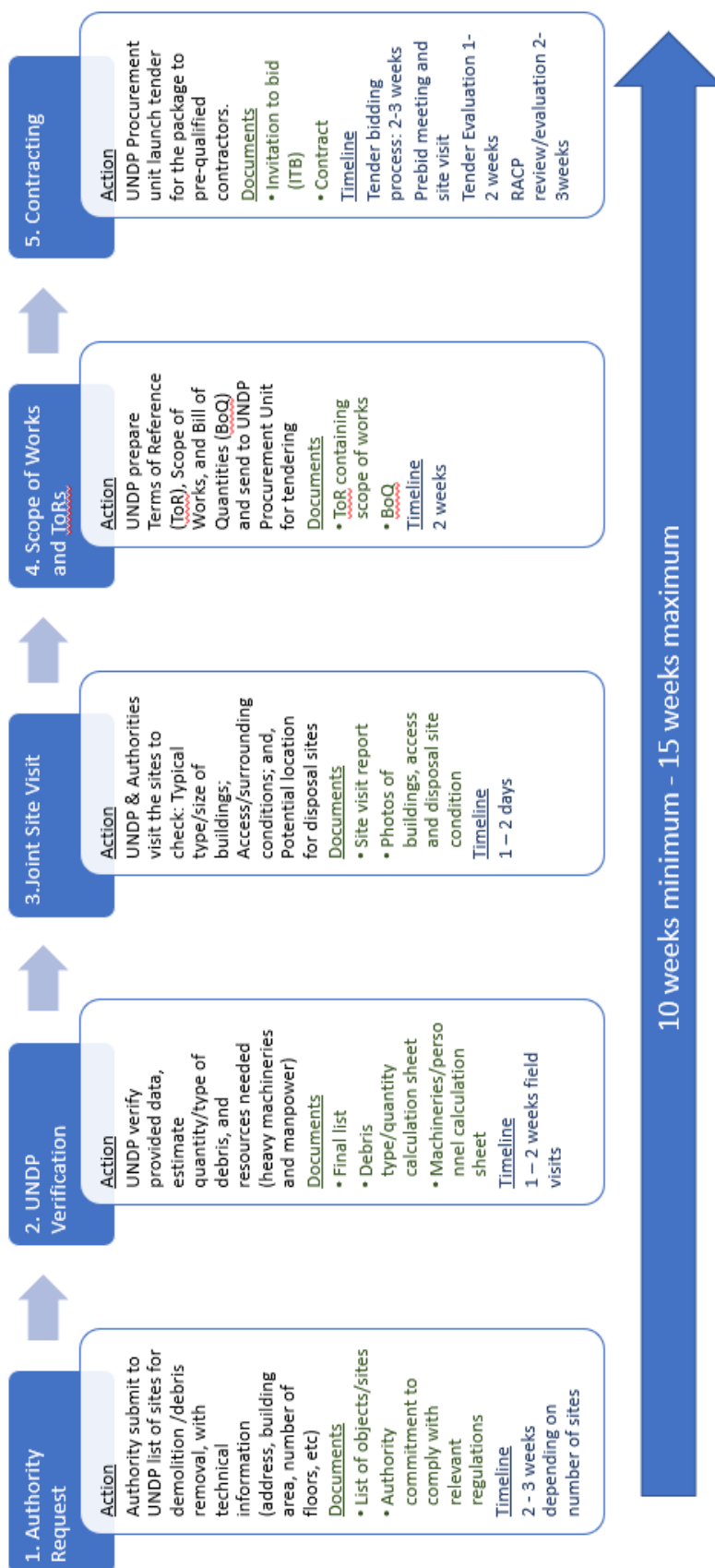
[Link here to HLP work by the ER Cluster, NRC etc.....or share our UNDP debris approvals memo?](#)

## 7. Debris Removal Implementation Steps

### UNDP Debris Removal Implementation Steps

*This process is for the planning and contracting of debris removal and demolition works in a defined local council area with numerous buildings and sites included in a single package of works*

Version 5.0



## 8. Debris Recycling

There is the opportunity to recycle the debris into a (re)construction material which has many benefits:

- ✓ Cost savings since recycled debris is often cheaper than natural raw materials from quarries as the debris is often already located at the site of end use as a (re)construction material;
- ✓ Reduced truck movements where trucking can be a major burden on already heavily trafficked roadways in post-conflict recovery;
- ✓ Natural resource conservation since reduced extraction of raw construction materials from the quarries; and,
- ✓ Reduced burden on the landfills and dumpsites that would otherwise have received the debris and in turn can then receive more solid waste.



The recycling of debris is common practice for debris management works and to enable recycling the debris it is important the removal works:

1. Include requirement to sort out waste from the debris so only the recyclable materials are transported to the debris disposal site. This includes concrete, bricks, building blocks, roofing tiles etc.; and,
2. A debris disposal site is located that is large enough to store the debris until the recycling plant and machinery arrives.

## 9. Disposal Sites

It is important to agree where the debris and the waste will be taken.

It is important to distinguish between debris and waste since they are different types of materials and should not be mixed:

**Debris** is the material from damaged buildings including concrete, bricks, roofing, timber, windows, furnishings and fittings

**Waste** is the household waste that is generated by households in the daily living and includes food waste, packaging, discarded household goods etc.

*When the concrete and bricks are sorted from the debris then it can be recycled into a new construction material.....if the debris is mixed with waste then it **cannot** be recycled!*

At the outset of debris removal, the locations for debris and waste disposal is important so all contractors know where to take the debris and waste.

### Debris Disposal Site

A debris disposal site should be on level ground, not close to a water course nor residential and have suitable access for trucks and heavy plant and machinery. **A checklist for the identification of debris disposal sites is included in the Annexes.**

Once the debris disposal site has been established, only the following materials are to be accepted:

- a. Clean concrete, i.e. concrete blocks and fragments.
- b. Clean masonry, i.e. roofing tiles and construction bricks.

- c. Mixed clean concrete and masonry (as above).
- d. Rough cut stone, i.e. from buildings made of stone.
- e. Mixed recyclable demolition rubble, i.e. mixed rubble containing more than 75% recyclable concrete and masonry.

#### Waste Disposal Site

Waste disposal sites are different to debris disposal and should follow the below parameters:

- Waste disposal sites to be allocated and authorised by local authorities
- Ensure the waste disposal site is environmentally sound and not close to water courses or residential areas
- Establish disposal site with fencing, gate and control of incoming wastes
- Establish cells and waste disposal operations with cover material
- Document waste received

### **10. Safety**

Safe works are key to the success of debris removal works.

Key actions include:

- ✓ Inspection of sites to make sure there are no UXO or mine threats at site in collaboration with local mine action partners;
- ✓ Inspection of sites by civil engineer to identify any unstable walls or structures which could collapse during the works...and where these exist to highlight them to the debris removal supervisor before works start. Measure will need to be put in place to manage the unstable structures;
- ✓ Make sure all services (electricity, water, gas etc) are isolated and disconnected before debris removal works start;
- ✓ Ensure traffic routings are planned with clear areas for truck and heavy plant movements; and,
- ✓ Make sure all workers have the right Personal Protective Equipment (PPE) before works start.

For PPE, debris workers need to wear:

- Safety Boots
- Gloves
- Hi-visibility shirts/tops
- Masks
- Safety glasses
- Hardhats
- Long sleeved shirts and long trousers

#### *Debris Removal: Dos and Don'ts*

- ✓ DO hold pre-start safety talks led by the supervisor and attended by all personnel
- ✓ DO make sure at the start of every day that all workers have the right PPE
- ✓ DO communicate with the neighbours and school principals about the works, how long they will take, what measures are being taken to prevent un-authorized access during the works
- ✓ DO cordon off the work site to prevent the general public and children from entering the site
- ✓ DO make sure all electricity and water have been disconnected from the building as live services can kill or injure
- ✓ DO look for potential asbestos and follow guidelines in case of asbestos risk
- ✓ DO look for any basements or cellars and make sure they are clearly signposted as they pose a risk of falling
- ✓ DO make sure there is a first aid box at site for minor injuries
- ✓ DO keep a look out for your colleagues and tell them if you see anything of risk
- ✓ DO keep a look out for ERW, human remains and hazardous wastes
- ✗ DON'T remove debris from the bottom of the debris pile since the pile may collapse onto you

- ✘ DON'T leave the works site until all potential collapses of building elements and structures have been removed to prevent persons being injured if they enter the site
- ✘ DON'T load trucks without a banksman – someone who is looking to make sure that no persons enter the area of loading
- ✘ DON'T operate plant and machinery if you are not properly trained and competent for that specific plant or machinery

## 11. Transport Management

The transport of debris is often the high cost element in debris removal and management. It therefore needs to be planned and managed from the outset.

There are two main mechanisms for bringing the debris from its source (i.e., location of damaged building) to the treatment site for recycling, reuse or disposal:

- **Push** which entails paying an organisation (i.e., contractor or through cash-for-work) to bring the debris to the treatment site; or,
- **Pull** which entails paying a sum of money for every load of debris brought to the treatment at a set rate, i.e., 10SYP per wheel barrow of bricks.

Where trucking is used for the transport of debris it is key that:

- A robust payment mechanism is established either by truckload or daily rental of the trucks (with operator and fuel);
- Seek to include pull mechanisms, i.e. pay community to bring debris to the recycling centre;
- Ensure there are clear and proper access roads to the recycling and disposal sites for the trucks; and,
- Establish transport routes for use by trucks which do not disturb schools, hospitals and other sensitive facilities.

## 12. Debris Resource Requirements

For manual debris removal works the following tools and equipment are typically required:

- Labourers for Cash-for-Work
- PPE
- Shovels, wheelbarrows etc.
- Bolt cutters for reinforcement bars in concrete
- Axes and chainsaws if clearing roads and sites of fallen trees

For mechanical debris removal:

- Wheel Loaders / Excavators for loading trucks with debris
- Excavators if bringing down unstable walls
- Trucks for transport of debris and waste to the respective disposal sites

## 13. Training

The 2 main training elements for debris removal are:

- Health & Safety as well as UXO/IED handling training (see above section on Safety); and,
- Training for debris removal labourers in sorting of debris for future recycling (see above section on Debris Recycling)

#### **14. Debris Removal Contracts**

Debris removal contracts are to include as a minimum the following:

- Design contracts for performance and minimum requirements if using a contractor
- Clear end state defined for how the site looks after works are complete
- Include Cash for Work as a potential requirement
- Facilitate the incorporation of, and support to, local businesses in the debris removal works
- Include and enforce keeping debris clean and dumping at the debris disposal site for later recycling
- Debris trucking payment mechanisms (per m<sup>3</sup>, truckload or daily rent)
- Damage to 3<sup>rd</sup> party properties
- Health & Safety minimum requirements

#### **15. Monitoring Debris Removal Works**

It will be important to establish debris management and monitoring team(s) for the works to ensure works progressing safely and to requirements.

Furthermore, reporting of the works undertaken is key for future documentation where based on before and after works:

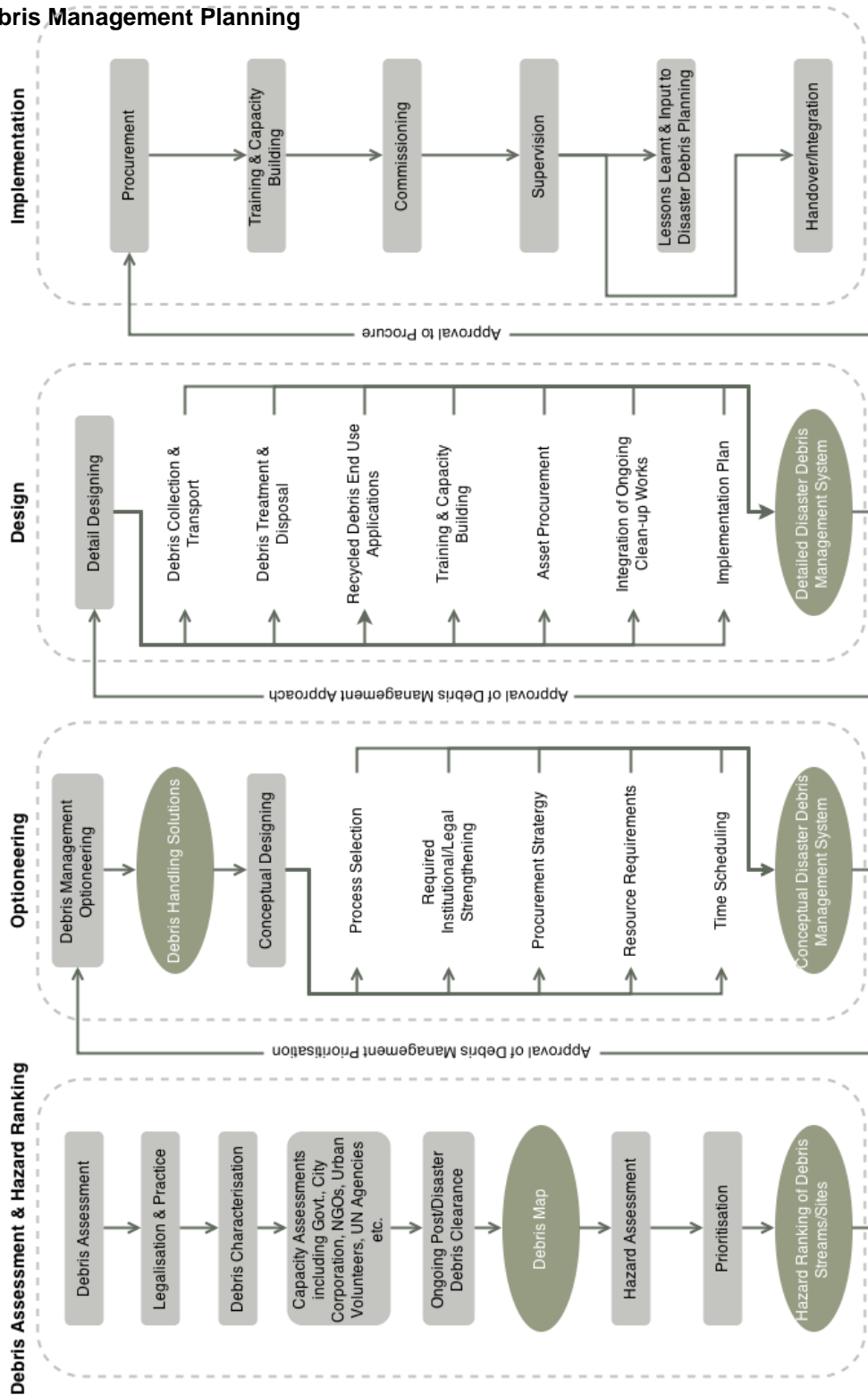
Before works start ensure photos are taken of the site, brief description of the works to be undertaken and confirmation that all authorisations are in place; and,

After works document the works undertaken including quantity of debris removed and any issues encountered. Include a photo of the site on completion of the works.

##### **Implementation Tools**

- Sample contract with debris handlers
- Contract monitoring tools
- Voucher template for paying contractors
- Debris removal approval forms (Debris permits)
- Debris loading/tracking/tipping forms
- Debris receipt forms at the processing sites
- Safety equipment – Issue register

## 16. Debris Management Planning



## 17. Checklist

Before debris removal starts have you got the following in place:

- Authorisations for the debris removal
- Debris Disposal site agreed and authorised
- Waste Disposal site agreed and authorised
- Clear scope of works for the debris removal works with defined end state of the works
- Sorting of the debris is included as a requirement
- Works sites are cleared for UXO and other hazards
- Services and utilities are disconnected
- A clear contract model and payment model in place
- All labourers and operators are trained in debris handling, H&S, UXO etc.
- Monitoring teams in place
- Monitoring forms and way of reporting established



## Authors and Institutions

### AUTHORS

The NW Syria Environmental Country Profile for Shelter and Settlement was drafted by C. Kelly, Disaster and Environment Advisor, WWF/US for the Shelter/NFI Cluster NW Syria XB Hub as a contribution to post earthquake response operations.

### INSTITUTIONS

Shelter/NFI Cluster NW Syria  
X- Border hub:

<https://sheltercluster.org/response/North-West%20Syria%20Hub>

Environment Community of Practice  
Global Shelter Cluster

<https://sheltercluster.org/communitypractice/environment-communitypractice>

WWF/US

1250 24<sup>th</sup> Street NW Washington,  
DC 20037

<https://envirodm.org/>

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