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Detailed shelter response profile Syria northwest

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DETAILED
SHELTER RESPONSE PROFILE

SYRIA NORTHWEST

LOCAL BUILDING CULTURES
FOR SUSTAINABLE
AND RESILIENT HABITATS

1ST EDITION
JULY 2023



Shelter Response Profiles (SRP)

BACKGROUND

The organisations backing this document (see back cover) have been working for several years on the elaboration and dissemination of an identification method for local building cultures and practices (LBC/LBP), especially regarding their potential to contribute to Disaster Risk Reduction (DRR), and also to shelter and housing responses in post-conflict situations. The aim is to facilitate the identification of the strengths and weaknesses of LBC/LBP and the opportunities they offer – in an adapted version if necessary – in housing reconstruction, retrofitting or improvement projects.

In doing so, it is essential to consider that families and communities often live in changing environments due to factors such as conflict, climate change, urbanization, globalization, and changing socio-cultural attitudes. Thus, even if local practices are meaningful, they are challenged, and it is still advisable to find locally manageable solutions and limit innovations so that they can be adopted toward sustainable development and increased local resilience capacity.

SRPs are part of a broader set of tools and documents developed and used to facilitate contextualization of responses. They are one of the proposed activities of the Protocol “[Informing choice for better shelter](#)” in its step 1 “Understanding the context”, developed by the “[Promoting Safer Building Working Group](#)” (now evolved towards [Recovery CoP](#)) of the Global Shelter Cluster.

OBJECTIVES

SRPs have several complementary objectives:

- To help to recognise the importance of understanding a context before proposing any action or project.
- To favour the development of shelter and human settlements responses (preparedness, early-recovery or later phases linking with development stages) more focused on localization, reduction of climate change and environmental impacts, and promotion of self-recovery strategies.
- To help to better take into account the existing construction sector, natural and human resources, local knowledge, existing solutions and good practices, and local cultural and social practices such as existing DRR

knowledge, know-how and techniques at various scales (materials, building systems, house, compound, settlement organisation).

- To give a non-exhaustive overview of a country or territory: demographic, cultural, social and economic data; hazards, environment and climate change impacts; impacts of crises in the population; HLP issues; legal and institutional framework; construction sector, etc., and so to help orient practitioners in new contexts.
- To eventually become an advocacy tool for the shelter sector/cluster members, agencies, donors, or local authorities for more localized actions, facilitating self-recovery and communities’ resilience.

CONTENT AND SUGGESTIONS FOR USE

This document introduces reference data on local building cultures and sociocultural strategies that result in people’s resilience. It also provides evaluation criteria that can help in elaborating locally adapted project- strategies.

Context and details differ from place to place, and stakeholders benefit from the collected data to make comprehensive and accurate decisions. Thus, SRPs should not be considered exhaustive. They are a first level of information that needs to be deepened through field analysis of the specific intervention context. It remains essential to organize field surveys that will allow exchanges with local actors and inhabitants on the constraints and potentials of territories in terms of access to land, lifestyles, material and human resources, practices, knowledge, and construction capacities.

TARGET AUDIENCE

Local, national, international, governmental, non-governmental and civil society actors that are involved in the prevention, preparedness and response to humanitarian crises (disasters or conflicts) in the shelter, housing and human settlements sector.

HISTORY OF THE SERIES OF SRP

This publication is part of the series of documents “Local Building Cultures for sustainable and resilient habitats” that was launched in 2016. Several documents have been produced after a disaster (Fiji, Ecuador, Haiti) or before a disaster strikes

as a preparedness tool (Bangladesh, Tonga, Malawi, Nepal). Most profiles have been elaborated for situations of both protracted crises and disaster contexts (Ethiopia, Democratic Republic of Congo, Burkina Faso, Yemen, Venezuela, Somalia, North-West Syria...).

NW SYRIA PROFILE: INFORMATION, DATA COLLECTION AND PRODUCTION

This Shelter Response Profile was produced from September 2022 to April 2023. The process was coordinated by CRAterre and Northwest Syria – Turkey Hub Shelter Cluster, with several Syrian/X-border-based organisations having contributed to the process.

Besides those contributions, documentary research was undertaken, with a dedicated literature review of nearly 200 documents (see [Sources consulted to produce this document](#)).

This Profile has been revised by several international experts and shelter and housing actors in Northwest Syria.

It summarizes and disseminates strengths of local construction and practices, including a variety of hazard-resistant practices, considerations about disaster prevention, risk reduction and mitigation measures, environmental impacts, knowledge and experience developed by local communities, etc.

This document is intended to be a living one, and new contributions are highly appreciated – please contact secretariat@craterre.org and NW Syria – Turkey Hub Shelter Cluster coordination.

↳ For more information

SHELTER RESPONSE PROFILES

<https://www.sheltercluster.org/promoting-safer-building-working-group/library/shelter-response-profiles>

PARTICIPATORY ASSESSMENT OF LOCAL BUILDING CULTURES

<https://sheltercluster.org/promoting-safer-building-working-group/library/understanding-context-forms-and-report-template>

SHELTER RESPONSE PROFILES

[Fiji](#)

[Ecuador \(coast\)](#)

[Haiti](#)

[Bangladesh](#)

[Ethiopia](#)

[Democratic Republic of Congo \(southeast\)](#)

[Malawi](#)

[Tonga](#)

[Burkina Faso](#)

[Yemen](#)

[Venezuela](#)

[Somalia](#)

[Syria \(Northwest\)](#)

ABOUT TO BE RELEASED:

[Nepal](#)



Cover photos (from top to bottom):

Nomadic Bedouin tent, Syrian desert © CRAterre

Earthen dome houses, Aleppo governorate © CRAterre

Idleb – ancient part of the city © Alsouria

Foreword

► HUMANITARIAN CONTEXT

Nearly 12 years of war and economic collapse have left over 15 million people in Syria in need of humanitarian aid. Some of the most critical needs are in the north-west of the country, where 4.5 million people, mostly women and children, are trapped in a war zone along the border with Türkiye. Syria remains a complex humanitarian and protection crisis compounded by over ten years of hostilities, protracted displacements, and prolonged consequences, including destruction of civilian infrastructure and violation of international humanitarian and human rights law. Humanitarian needs in NWS remain immense, with an estimated 4.1 million people (out of 4.5 million) in need of assistance at the end of 2022. 2.8 million people in NWS are internally displaced, of which 1.8 million are living in over 1,400 IDP sites (up from 1.7 million in summer), many of them still in tents and makeshift shelters.

The Security Council Resolution 2672 renewed cross-border aid operations into Northwest Syria for six months, until 10 July 2023.

Access to essential services, including Education, Food Security, Health, Nutrition, Protection, Shelter and NFIs, and Water, Sanitation and Hygiene services, remain limited throughout much of NWS. 57 % of IDP sites in NWS do not have access to primary schools and 80 per cent to secondary schools, which severely hinders their access to education. 3.1 million people in NWS are food insecure and 1 out of 4 children under-5 is stunted. Only 13 % of households in NWS report having all official documentation they need.

The massive displacements during escalations in the conflict combined with the inadequacy of IDP sites and extreme living conditions, especially during winter, has become a major humanitarian concern. IDP sites have critical levels of overcrowding where 86% of IDPs are living in critical density situations. Some figures could hide a lot of vulnerable groups sufferings such as: Overcrowding, lack of privacy and being forced to share shelters with non-family members increases GBV risks for women and girls. Young children and older people are particularly vulnerable to extreme weather conditions specially during winter. Sites lack essential services such as drainage and sewage infrastructure and electricity. Every year, sites have flooded, leading to the destruction of tents and makeshift shelters and access roads, also as a result

of a lack of adequate planning. IDPs living in sites need access to livelihoods opportunities, education and health services.

► HIGH VULNERABILITIES

As of December 2022, close to 1.86 million people are living across 1,430 IDP sites in NW Syria. For ten years, shelter programming has predominantly focused on emergency life-saving responses, especially the distribution of tents. This was vital as an emergency response measure. However, as this is a protracted crisis, the humanitarian context has evolved and there is a need provide more dignified, transitional shelter and living conditions to IDPs living in these sites.

According to MSNA data only 21 % of all camps are connected to water networks and 64 % of shelter set-ups do not accommodate the needs of persons with disabilities. 93 % of camps do not have any easy access to basic services, while 76% of IDP sites do not have a camp management system in place. This disproportionately impacts women's, girls, boys' and people with disability's mobility and access to basic services, including to reproductive health and protection services.

2022/23 winter season in NWS started, with cold temperatures, rain, wind, and snow expected to add an additional layer of challenges to the people of NWS. CCCM's winter weather risk analysis indicates that 838 IDP sites in NWS are now in the "bad", "very bad" and "catastrophic" risk levels. Last winter season, more than 22,800 tents were damaged, and more than 6,700 tents were destroyed due to weather incidents. One-third of IDP sites were flooded, affecting over 540,000 people.

Cholera continues to rapidly spread in NWS. Until 26 November, there were 16,389 suspected cholera cases in NWS, of which 408 were confirmed positive. 12 people died during the same time because of cholera. The ongoing COVID-19 pandemic with still a low vaccination coverage continue to pose challenges.

Almost daily hostilities continue along the frontlines in NWS. Following renewed statements and reports about a possible military operation, humanitarian partners developed a contingency plan to meet the needs of up to 568,000 people who could potentially be displaced, up to 60,000 to NWS.

According to the CCCM Cluster, from 14 January to 3 March, more than 152,700 IDPs were affected by the flooding, with

one death and three injuries reported, as well as some 27,700 tents destroyed or damaged. Many people also had food and household items damaged or destroyed during the floods. This affected at least 418 IDP sites, and access issues were reported due to the flooding. The flooding increased the need for tent replacements, food, non-food-items, plastic sheets, multi-purpose cash assistance, ground levelling, winterization and gravelling support, and provision or repair of WASH services.

The earthquakes that struck Syria and Türkiye on 6 and 7 February 2023 have caused over 5,900 deaths and 11,000 injuries, as well as widespread damage and destruction of buildings and infrastructure inside North-West Syria, where around 1,900 buildings totally collapsed and over 9,000 buildings were partially destroyed. The Shelter Cluster estimated that 53,000 households [265,000 individuals] have lost their homes, 44,000 households [225,000 individuals] have suffered moderate damage and 126,000 households [632,000 individuals] minor damage and will need repair and rehabilitation support. The Shelter Cluster and its member organizations are continuing to work on better understanding the damage and needs in the most affected locations.

Since the beginning of the response Shelter cluster members have responded with emergency shelter, NFI reaching [reported on 27 March 2023]:

- 91,805 individuals reached with emergency shelter
- 191,495 individuals reached with NFIs
- 16,770 individuals reached with emergency shelter kits
- 43 Cluster members have reported completed activities in response to the earthquake

The first phase of the response focuses on addressing the immediate needs of those who have been affected by the earthquake through life-saving emergency assistance such as the provision of NFIs and emergency shelter.

The second phase of the response will focus on providing more life sustaining shelter response for those who have lost their houses due to the earthquake damage. This includes shelter repair and rehabilitation assistance for the minor and moderate damage houses as well as providing access to dignified shelter and living conditions for those who have lost their homes.

► ADAPTED LOCAL BUILDING CULTURES (LBC)

A new participatory approach for Dignified and Safer Living Conditions is needed, one that adapts to the more complex, inter-sectoral challenges of protracted displacement, ensures that affected communities are central to planning, while remaining within the parameters of humanitarian action.

IDPs and local communities including some humanitarian organizations have already started to develop shelter units using local materials that are available in the markets with cheaper cost if compared to imported materials and shelter.

Local materials used to establish new dignified shelter units offer good resistance against hazards such as heavy rains and wind. The installation materials are available locally and local contractors are familiar with these installation techniques. Despite this, to provide thermal comfort throughout the year further insulation could be provided to insulate the rooms.

In many cases, IDPs living in tents or other temporary shelters have appropriated camp spaces by expanding and modifying household shelter structures to suit their needs. In some camps, IDPs are encouraged to undertake shelter improvements, with assistance shifting from in-kind to cash with encouragement towards self-reliance and self-management approaches. As part of the approach towards dignified shelters, IDPs should play a vital role in their own assistance and ability of self-management. In such a protracted context in Syria through the course of the crisis, the host communities responded to the first urgent needs of shelter so we could see many IDP HHs have been hosted by other family where they used to share the shelter and facilities. Other IDP HHs headed to collective centres, unfinished buildings and apartments.



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[1] Introduction

WHY LOCAL BUILDING PRACTICES ARE IMPORTANT TODAY ¹

All over the world, societies have managed to produce, adapt and develop their habitat according to their needs, interests, aspirations, preferences, availability, affordability and abilities, making the best use of locally available materials. Strategies developed take advantage of natural resources to protect against the destructive forces of nature and have always generated rich and varied knowledges at local levels.

(Re)discovering the intelligence of local architectures and analysing their associated practices is often very useful in the process of designing disaster-resistant architectures in line with build-back-safer principles, but also to adapt to contemporary lifestyles and their evolution, respect the local environment and culture and conform to the technical and economic capacities of local populations.

Relying on, or at least getting inspiration from local knowledge, know-how, construction processes, and traditional means of organisation has proven to be very effective, as it favours:

- The implementation of solutions well adapted to local ways of life and the suggestion of viable improvements;
- The possibility to shelter many people quickly and cost-effectively while taking into account seasonality effects as well as factors like religious festivals and livelihood activities;
- Large-scale reproducibility of the improvements designed in continuity with local building cultures and an easy access, both financially and technically, to the promoted solutions for non-beneficiaries.
- A positive impact on local economies as local skills and materials are fully promoted while also taking into account environmental concerns linked to the construction industry;
- Extensive short and long-term ownership by the beneficiaries through their participation in decision-making and project implementation processes;
- Empowerment of local populations through the recognition of the value of their existing capacities for building and the improvement of their resilience.

¹ The concept of Local Building practices and other key terms related to the topics addressed in this document are defined in Section [Key concepts](#), p.74.

To develop a disaster-resistant architecture adapted to the local lifestyle, it is crucial to involve the beneficiaries, the local professionals and decision-makers from the very beginning of the recovery phase. Also, rebuilding is often necessary and can be very demonstrative and convincing; therefore, promoting appropriate repairs, when possible, may help achieve this goal. This way, the link between relief, recovery and development is enabled, so the long-term benefit of a shelter project is ensured. In addition to the supply of shelters, the project will have a higher level of resilience.

ARTICULATION WITH THE NORTHWEST SYRIA - TURKEY HUB SHELTER CLUSTER STRATEGY

The 2022–2023 Syria HRP retains the three Strategic Objectives of saving lives, enhancing protection and increasing resilience and access to services that underpinned the previous HRP. The additional Specific Objectives are representative of some emblematic, multi-sector, targets under the Strategic Objectives, but are not the totality of the planned response. A longer horizon for planning interventions allows for a stronger integration of early recovery response and their sequencing with shorter term, life-saving interventions.

(1) Saves lives: Provide life-saving and life-sustaining humanitarian assistance to the most vulnerable people, with an emphasis on those in areas with a high severity of needs.

Specific Objective 1.1: 2.05 M IDPs in last resort sites access life-saving and sustaining humanitarian assistance through basic services

Specific Objective 1.2: The health, nutrition and food security status of approximately 1.7 million pregnant and lactating women (PLW) and approximately 3.1 million children under 5 years of age are improved

(2) Enhance protection: Enhance the prevention and mitigation of protection risks and respond to protection needs through supporting the protective environment in Syria, by promoting international law, IHL, IHRL and through quality, principled assistance.

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Specific Objective 2.1: The threat posed by explosive ordnance is mitigated to ensure safe access to services and an inclusive protection environment.

Specific Objective 2.2: Gender-Based Violence (GBV) risks for 7.3 million people are mitigated through the provision of quality and integrated services.

(3) Increase resilience and access to services: Increase the resilience of affected communities by improving access to livelihood opportunities and basic services, especially among the most vulnerable households and communities.

Specific Objective 3.1: 12.3 million people have improved access to basic services, adequate housing, and community infrastructure.

Specific Objective 3.2: Enhance access to market-based livelihood opportunities and production for 236,000 households (approximately 1,416,000 people).

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.

The HLG supports emergency, temporary shelter for IDPs in NW Syria. This includes a range of different activities aimed at ensuring safe and dignified living conditions for displaced people.

All shelter support is provided in accordance with humanitarian principles, the Guiding Principles on Internal Displacement, and following due diligence on housing, land and property rights. All temporary shelter support for IDPs is provided while recognizing the right of people to seek and enjoy asylum, and the right of displaced people to return to their places of origin when the situation is conducive for safe, voluntary and dignified returns. While tents are suitable for the initial period of displacement (6-12 months), where possible the HLG supports improved temporary shelters for people facing protracted displacement that have longer life-spans and provide greater levels of protection.

All humanitarian shelter should be coordinated through the Shelter Cluster and follow agreed cluster guidelines.

[2] Profile

[2.1] GENERAL DESCRIPTION

► LOCATION, PHYSICAL AND TOPOGRAPHICAL DATA



CC Wikipedia Commons

Syria is a Western Asian (Middle East) country located in the Eastern Mediterranean and the Levant, bordered by the Mediterranean Sea (west).

With fertile plains, high mountains and deserts, it is primarily a semiarid and desert plateau, with a narrow coastal plain and mountains in the west.²

Straddling the northwest of the Arabian plate, Syria stands in one of the so-called “cradles of civilization” – the “Fertile Crescent”.³



Governorates of Syria – © World Atlas



Physical map – © World Atlas

The Euphrates River is the most important water source and the only navigable river in Syria. It originates in Türkiye and flows south-eastward across the eastern part of Syria.⁴

↳ Located in the Southwest of the country, at the foothills of the Anti-Lebanon mountain range, in an oasis at the foot of Mount Qasiyun and on the Barada River, Syria’s capital and largest city, Damascus (Dimashq), is believed to be one of the world’s oldest continuously inhabited cities.⁵

Official name: Syrian Arab Republic (English) / الجمهورية العربية السورية (Arabic) / al-Jumhūrīyah al-‘Arabīyah as-Sūrīyah (Romanised)

Capital: Damascus (33°30' N, 36°18' E)

Total land: 185,887 km² (includes 1,295 km² of Israeli-occupied territory)

Lowest point: -200 m (unnamed location near Lake Tiberias)

Highest point: 2,814 m (Mount Hermon / *Jabal a-Shayk*)

Coordinates: Latitude 35° to 38° N, Longitude 35° to 43° E

Coastline: 193 km

Borderline: 180 km

Neighbouring countries: Türkiye (north), Iraq (east/southeast), Jordan (south), Palestine (southwest), Lebanon (west)

Administrative data: Syria is a unitary republic divided into 14 governorates (*sing muhafazah*) – Aleppo (Halab), Al-Hasakah, Al-Suwayda, Damascus (Dimashq), Daraa, Deir ez-Zor, Hamah, Homs (Hims), Idlib, Latakia, Quneitra, Raqqa, Rifdimashq, Tartus.

These governorates are subdivided into 61 districts (*sing mintaqah*), each one with a number of sub-districts

With 42,223 km², the Homs governorate is the largest in the country, while the most populous is Aleppo, with 2,392,045 hab. (Feb.2021 data)

Data: United Nations, CIA-The World Factbook, UNESCO, Encyclopaedia Britannica, ICRC.

² (CIA, 2022)

³ (Encyclopaedia Britannica, [s.d.])

⁴ (Encyclopaedia Britannica, [s.d.])

⁵ (*ibid.*, [s.d.])

10 PROFILE

► CLIMATE

The Syrian Arab Republic has a combination of arid and semi-arid environments⁶, comprising several distinct climatic conditions: the western coastal plain is the most humid area of the country, with milder winters and summers than the rest of the country. East of the Orontes Valley begins the desert region. In general, the climate is mostly desert; hot, dry, sunny summers (June to August) and mild, rainy winters (December to February) along the coast.⁷

About 60% of the country averages less than 250 mm of rain annually. In the Syrian desert it is common for annual precipitation levels to fall well below 100 mm.⁸ Latakia is the region with the highest annual precipitation, while the region of Palmyra is the driest.⁹ Despite the low average rainfall, heavy rain episodes have been increasing the risk of flood (see [\[2.3\] Natural hazards](#))

In winter the prevailing winds blow from the east, the north, and the west. In summer the prevailing winds are either northerly or westerly. During the summer the coastal region is subject to westerly winds during the day and easterly ones at night. Once or twice a year sand-bearing winds, or *khamsin*, raise a wall of dust some 5,000 feet (1,500 metres) high, which darkens the sky.¹⁰

In spring (Mar.-May) and less often in autumn (Sep.-Nov.), Syria is sometimes affected by strong southerly winds that cause massive sandstorms that raise temperature considerably. These sandstorms damage vegetation and keep livestock from grazing.¹¹

► VEGETATION AND ANIMALS

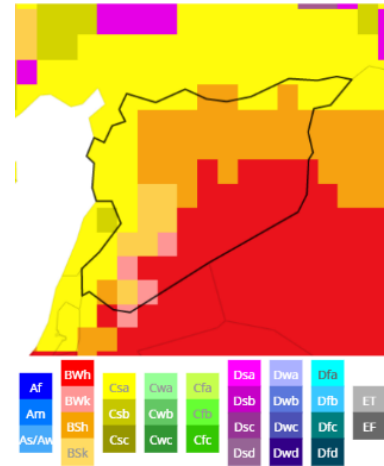
► **The majority of the country area is covered by the Syrian desert. Natural forests cover approximately 2% of the landscape, and water less than 1%.**

Syria is considered a poor country in terms of forests. Historically documented information shows that Syria was covered with forests and trees extended from the Mediterranean to the limit of Syrian Badia, constituting over 32% of land at the beginning of the last century.¹²

Yew, lime, and fir trees grow on the mountain slopes. The date palm is found in the Euphrates valley. In both coastal and inland regions, plants include grains, olive trees, grapevines, apricot trees, oaks, and poplars. Lemon and orange trees grow along the coast. Garigue, a degenerate Mediterranean scrub, and maquis, a thick scrubby underbrush, cover many slopes.¹³

In both Idlib and Aleppo governorates, plants include grain, olive trees grapevines, apricot trees, oaks, and poplars. Pistachio trees are so popular in NWS while olive trees are heavily planted in these sites with several olive oil refineries popular. The majority of the populations were dependent on agriculture, but access to their lands and safety could be the major burden.

Forests make up only a very small percentage of NWS. But the excessive exploitation of the forests for their wood has largely turned them into scrub. In Aleppo, the steppe



Köppen-Geiger Climate Classification, 1991-2020 - Climate Change Knowledge Portal © World Bank Group

► **Temperatures (1960 to 2022)**

Highest: 47.3 °C (Kamishli, Jul. 2021)

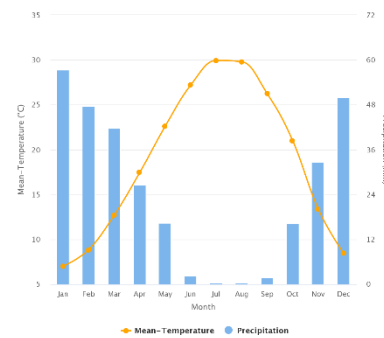
Lowest: -17.0 °C (Aleppo, Feb. 2001)

Hottest summer: 30.5 °C, 2010
(normal average summer temp.: 28.4 °C)

Coldest winter: 6.3 °C, 1992
(normal average winter temp.: 9.7 °C)

*Summer: Jul-Sep. / winter: Jan.-Mar

worlddata.info



Monthly climatology of mean-temperature and precipitation in Syria from 1991-2020 - Climate Change Knowledge Portal © World Bank Group

► **Precipitation measured from 1960 to May 2022**

Highest: 15.7 mm per day (Latakia, January 1981)

worlddata.info

⁶ (RCCC-ICRC-Country-profiles-Syria.pdf, [s.d.])

⁷ (Country Reports, [s.d.])

⁸ (RCCC-ICRC-Country-profiles-Syria.pdf, [s.d.])

⁹ (Worlddata.info, [s.d.])

¹⁰ (Encyclopaedia Britannica, [s.d.])

¹¹ (RCCC-ICRC-Country-profiles-Syria.pdf, [s.d.])

¹² (Initial National Communication of the Syrian Arab Republic - Submitted to the UN Framework Convention on Climate Change, [s.d.])

¹³ (Encyclopaedia Britannica, [s.d.])

is characterized by the absence of natural tree cover, except for some sparsely distributed hawthorns. For a brief period before June, the land is covered with a variety of flowering and grassy plants.

The mule is the beast of burden in the mountains, and the camel on the steppe. Other domesticated animals include horses, donkeys, cattle, sheep, goats, and chickens. Bees also are kept.¹⁴

[2.2] KEY DEMOGRAPHIC, CULTURAL, SOCIAL AND ECONOMIC DATA

➤ THE DATA IN THIS SECTION REFERS TO WHOLE OF SYRIA AND NOT JUST NWS

▶ DEMOGRAPHIC DATA

There is a significant population density along the Mediterranean coast. Larger concentrations found in the major cities of Damascus, Aleppo and Homs. More than half of the population lives in the coastal plain, the province of Halab, and the Euphrates River valley.¹⁵

The largest city in Syria is not its capital Damascus, but Aleppo, which is situated in the North East of the country. Aleppo's population was recorded at 2,132,100 in the 2004 Census, although it has dropped dramatically since, given the conflict and millions fleeing the country. Updated estimates on city populations are unavailable or may be skewed due to the fluctuations caused by the chaos.¹⁶

Damascus is the second largest city in Syria, with a population of 1,711,000 (estimate, 2009). It holds the record as the oldest continually inhabited city in the world; there is additional evidence of human habitation in Damascus dating back to 9,000 BC (however, historians have agreed that 2000 BC is the more likely time that Damascus was brought together into a single city from the smaller surrounding groups).¹⁷

➤ Now moving into its twelfth year, the conflict in Syria has inflicted an almost unimaginable degree of devastation and loss on the Syrian people and their economy. More than half the country's pre-conflict population (of almost 21 million) has been displaced, both internally and as refugees, mostly in neighbouring countries.¹⁸

▶ LANGUAGES

The great majority of the population speaks Arabic, which is the official language, and thus the medium of instruction in all schools and colleges in the country. Other languages spoken in Syria include Kurdish (Kirmanji dialect), spoken in the extreme northeast and slightly northwest, and Turkish, spoken in villages east of the Euphrates and along the border with Türkiye. English and French are understood, particularly in urban centres and among the educated.^{19 20} English is taught in Syrian schools starting

Population: 21.7 million ⁽ⁱ⁾

Pop. density: 119.48/km² ⁽ⁱⁱ⁾

Age structure⁽ⁱⁱⁱ⁾

- 0-14 years: 33.6%
- 15-29 years: 27.4%
- 30-44 years: 20.8%
- 45-59 years: 11.6%
- 60-74 years: 5.1%
- 75-84 years: 1.3%
- 85 and over: 0.2%

Population growth: 5.91% ^(iv)

Fertility rate: 2.8 per woman ^(iv)

Human Development index (HDI): 0.577 ^(v)

Life expectancy at birth: 74.28y
(male 72.82; female 75.84) ^(iv)

Gender Development Index (GDI): 0.825 ^(v)

(i) WFP, 2022

(ii) World Population Review, 2022

(iii) Encyclopaedia Britannica

(iv) CIA-The World Factbook, 2022

(v) UNDP, 2021

➤ FOR MORE INFORMATION

MINORITY RIGHTS GROUP

<https://minorityrights.org/country/syria/>

➤ EDUCATION

Expected years of schooling: 9.2

(male 9.2; female 9.1) ⁽ⁱ⁾ (UNDP, 2021)

Adult (15+) literacy: 86.4% (male

91.7%; female 81%) ⁽ⁱⁱ⁾ (World Factbook, 2015)

Total enrolment for Education: ⁽ⁱⁱⁱ⁾
(UNFPA, 2010 to 2020)

- Primary: 72%
- Upper Secondary: 62%
- Upper Secondary: 34%

(i) UNDP, 2021

(ii) World Population Review, 2022

(iii) Encyclopaedia Britannica

¹⁴ (*Ibid.*, [s.d.])

¹⁵ (CIA, 2022)

¹⁶ (World Population Review, [s.d.])

¹⁷ (*Ibid.*, [s.d.])

¹⁸ (World Bank, [s.d.])

¹⁹ (Encyclopaedia Britannica, [s.d.])

²⁰ (CIA, 2022)

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grade 1 as their primary secondary language, while French is taught from grade 7 up to grade 12.

► RELIGION

Although with a large Muslim majority, Syria is also home to one of the largest Christian populations in the Middle East (approximately 12% of the inhabitants of the city of Aleppo are Christian).²¹ The majority of people living in Northwest Syria – both host communities and displaced populations – are Muslim Sunni.

► EDUCATION

Education is free and compulsory from ages 7 to 15. The school system in Syria is divided into basic and secondary education levels: Primary Education Level: 1st to 6th grade; Lower Secondary Education Level (*taelim 'edady*): 7th to 9th grades; Upper Secondary Education (*taelim thanawi*): 10th to 12th grade.²² Early childhood education from ages 3 to 5 is also available in some schools.

When a student from the general secondary schools enters the 11th grade, he/she can choose the field of study from either literary or scientific branch. At the end of the 12th grade, students need to take an exam which will determine which university or college they can enter in and what specialization they can take. This exam is conducted nationally all throughout the country.

► Across the country, an estimated (Dec.2022) 2.45 million children are out of school, and an additional 1.6 million are at risk of dropping out.²³

The crisis in Syria has taken a devastating toll on education; leaving over 7,000 schools damaged or destroyed and over 2 million children out of school. Many of these children are the most vulnerable, including those recently displaced by insecurity.²⁴ More than one in three schools are damaged or destroyed, while others are used for purposes not related to education, such as shelter for displaced people.

Children attending school face daily challenges of over-crowded classrooms, the psychological scars of traumatic experiences, possible curricula and language problems, inadequate quality of teaching and a lack of materials. These factors place children at the increased risk of dropping out. Almost on-third of those enrolled do not make it to the end of primary school.²⁵

► According to the Idlib Education Directorate report (Nov.2021), there are 76 schools being used as IDP shelters, affecting approximately 30,000 children.

In NWS, learning spaces at IDP sites are linked to the local Education Directorates. All efforts were made to ensure education is recognized as formal so that students can have their credentials officially recognized for exam purposes when transitioning into public schools, to higher education, or into the workforce. Children usually have to walk long distances, especially to pre-primary and primary schools. More than 16% of camps without schools — nearly 100 in all — are 3km or more from a primary school.

► HEALTH

Physicians density: 14.1 / 10,000 pop.⁽ⁱ⁾

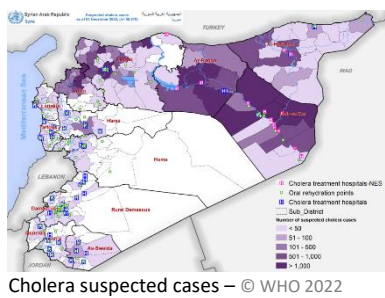
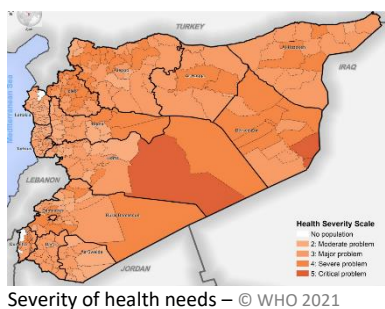
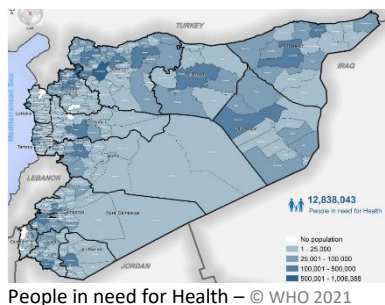
Nursing and midwifery density: 16.2 / 10,000 pop.⁽ⁱ⁾

Hospital bed density: 13.9 / 10,000 pop.⁽ⁱ⁾

Maternal mortality ratio: 31 deaths / 100,000 live births⁽ⁱⁱ⁾

Healthy life expectancy (HALE) at age 60: 13.9 (male 13.8; female 14.2) ⁽ⁱ⁾

(i) World Health Organization, 2021
(ii) UNFPA, 2017



²¹ (World Population Review, [s.d.])

²² (wikipedia, 2022)

²³ (ACAPS | Syria-anticipatory-winterNW_2022, [s.d.])

²⁴ (UNICEF, [s.d.])

²⁵ (Ibid., [s.d.])

315, which represents a majority of the camps without schools, are more than 3km from a secondary school. More than 35,000 IDP children and youth would have to travel at least 3km to reach a school. Safe and easy access to schools is needed. To facilitate access to education, projects should consider transportation as well as referring children to established local formal schools outside the camps.

► HEALTH

Weak, fragile and disrupted health systems, with concurrent public health emergencies and numerous challenges, affect not only the access, availability and quality of health services across NW Syria but also the physical and mental well-being of the vulnerable population.

In 2021, Syria experienced several major outbreaks of emerging and re-emerging diseases, including COVID-19, influenza-like illness (1,779,556 cases), acute diarrhoea (982,262), suspected leishmaniasis (111,144), severe acute respiratory infection (79,990), and acute jaundice syndrome (43,926). The principal risk factors contributing to this include acute and protracted humanitarian emergencies resulting in fragile health systems, increased population mobility, climate change and drought, environmental deterioration, weak surveillance and limited laboratory diagnostic capacity, and a decline in affordable health services.²⁶

Fewer cases of measles were reported in 2021²⁷ but, along with diseases of the digestive and respiratory systems, it remains the major causes for child mortality.²⁸

The increase of respiratory issues is most likely related to dust concentrations resulting from increasingly frequent sandstorms across the country. Infectious diseases, such as meningitis, conjunctivitis, and eye and skin infections, are also known to be linked to increased dust concentrations.²⁹ Climate-related disasters such as droughts, heatwaves, floods and sandstorms have an effect on an already strained public health infrastructure.³⁰

On September 2022, an outbreak of cholera has been declared³¹, with 57,000 suspected cases reported by December.³² This is linked to poor access to safe water.³³

COVID-19 vaccination coverage, preparedness, contingency planning, community health services, including outreach and engagement on integrated health messages, and management of severe acute malnutrition with medical complications remain essential components of comprehensive health services.

It is estimated that approximately 1 in 10 people in Syria lives with a mild to moderate mental health condition, and 1 in 30 is likely suffering from a more severe condition. Prolonged exposure to conflict increases the prevalence of mental health illnesses. COVID-19 pandemic exacerbated MH issues and made it harder for many to access treatment. Over 25% of households' children show signs of psychological distress.³⁴

► ECONOMY

Syria's economy has deeply deteriorated amid the ongoing conflict that began in 2011, declining by more than 70% from 2010 to 2017.³⁵ Syria's GDP shrank by more than a

► According to HNO 2023, IDPs, children, elderly, persons with disabilities, people with non-communicable diseases (estimated to account for 45% of all mortality in Syria), people with mental health and psychological conditions, and those with injuries are the most vulnerable groups in need of emergency lifesaving health services.

With recurrent disease outbreaks, particularly cholera, the key areas in 2023 that should be addressed throughout Syria, particularly in the north-east, are access to medicines and medical supply shortages, limited health care worker capacities, WASH in health facilities and surveillance systems.

(NWS-XB Shelter Cluster, 2023)

► Syria has long had severely strained (and damaged) health institutions. In 2013, the World Health Organization (WHO) reported that approximately 35% of Syria's hospitals are out of service; and, depending upon the region, up to 70% of healthcare professionals have fled the country. Many health facilities are either functioning at half capacity or have been forced to shut.

(ICRC, 2020)

► Only 59% of hospitals and 57% of public health care centres are fully functional

(OCHA, 2022)

²⁶ (World Health Organization | Syria - Annual report 2021, [s.d.])

²⁷ (*Ibid.*, [s.d.])

²⁸ (Encyclopaedia Britannica, [s.d.])

²⁹ (Sand and dust storms in the MENA Region, [s.d.])

³⁰ (RCCC-ICRC-Country-profiles-Syria.pdf, [s.d.])

³¹ (ACAPS.org, 2022)

³² (OCHA, 2022d)

³³ (Makieh, Makdesi, 2022)

³⁴ (OCHA, 2022f)

³⁵ (CIA, 2022)

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half between 2010 and 2020. The dramatic decline in Gross National Income per capita prompted the World Bank to reclassify Syria as a low-income country since 2018.³⁶ Before the conflict, extreme poverty in Syria (US\$1.90 2011 PPP per day) was virtually non-existent. It is now affecting more than 50% of the population.³⁷

The government controls the most vital sectors of the country's economy and regulates private business. The state operates the oil refineries, the large electricity plants, the railways, and various manufacturing plants.³⁸

Syria ranks fourth on the list of countries with the most corruption in the world. High paying jobs concentrate in Damascus, the country's capital.³⁹

↳ 90% of the population in Syria lives below the poverty line, and 44% of people in north-western Syria cannot afford bread.

↳ 67% of the population in Syria cannot afford essential items available in the market.⁴⁰

The agriculture sector employs 17% of the total workforce and represents 20% of the country's Gross Domestic Product (GDP).⁴¹ Syria's service sector – namely tourism – contributes heavily to the country's overall income, and at the beginning of the 21st century the sector employed about half of the country's workforce.⁴²

Syria faces an economic crisis, and the value of the Syrian pound has dropped to record lows. The economic downturn – which began when the conflict erupted – has accelerated since late 2019, leading to soaring prices of food, fuel, and other critical items. The cost of basic staples has increased by over 200% since late 2019. Food prices are 20 times higher than their pre-conflict levels. Households are forced to adopt negative coping mechanisms, including child labour, early marriage, and cutting or reducing meals. As of 2021, an estimated 12.4 million people in Syria – more than 70% of the current population, and the highest level ever recorded in the country – are food insecure, up from 7.9 million in 2020.⁴³

↳ 85% of household are unable to meet basic needs in 2022.

Average household income only covers 40% of expenses.

75% of households have less than 8h of electricity per day.⁴⁴

► GENDER

Gender based violence (GBV) continues to be a real and persistent threat in the lives of many women and girls. The continuation of armed hostilities significantly restricts women's and girls' freedoms, such as freedom of movement and the ability to seek employment, protection services, healthcare, information, and Assistance, trapping them in cycles of vulnerability and abuse. Inequitable gender norms which relegate women and girls to positions of subordination and justify the use of violence against them persist across Syria.⁴⁵

↳ ECONOMY

Currency unit: SYP - Syrian pound

GDP: \$11.08 billion (2020)⁽ⁱ⁾

GDP growth: -3.9% (2020)⁽ⁱ⁾

Real GDP growth (at constant market prices): -2.6% (2020)⁽ⁱ⁾

GDP per capita: \$533.4 (2020)⁽ⁱ⁾

GDP composition (by sector of origin): agriculture: 20%; industry: 19.5%; services: 60.8% (2017)⁽ⁱ⁾

Inflation: 60% (2022); (89.2% 2021); (114.2% 2020); (13.4% 2019)⁽ⁱ⁾

Poverty rate: 90% (2022 est.)⁽ⁱⁱⁱ⁾

Unemployment: 10.6% of labour force (modelled ILO 2021 est.)⁽ⁱ⁾

Labour force: 3.767million (2017)⁽ⁱⁱⁱ⁾

Labour force - by occupation: agriculture 17%; industry 16%; services 67% (2008 est.)⁽ⁱⁱⁱ⁾

Net migration rate: 40.58 migrants / 1,000 pop. (2022 est.)⁽ⁱⁱⁱ⁾

Agricultural products: cotton, wheat, barley, milk, olives, tomatoes, oranges, potatoes, sheep, lemons, limes^{(iii) (iv)}

Livestock raising: sheep, cattle, camels, poultry^(iv)

Industries: petroleum, textiles, food processing, beverages, tobacco, phosphate rock mining, cement, oil seed crushing, automobile assembly⁽ⁱⁱⁱ⁾

Natural resources: Petroleum, phosphates, chrome and manganese ores, asphalt, iron ore, rock salt, marble, gypsum, hydropower⁽ⁱⁱⁱ⁾

(i) World Bank

(ii) UNHCR (Nov.2022)

(iii) CIA-The World Factbook Organization

(iv) Encyclopaedia Britannica

³⁶ (World Bank, [s.d.])

³⁷ (World Bank, [s.d.])

³⁸ (Encyclopaedia Britannica, [s.d.])

³⁹ (Philipp, 2020)

⁴⁰ (OCHA, 2022e)

⁴¹ (RCCC-ICRC-Country-profiles-Syria.pdf, [s.d.])

⁴² (ACAPS.org, 2022)

⁴³ (*Ibid.*, 2022)

⁴⁴ (OCHA, 2022c)

⁴⁵ (*Ibid.*, 2022c)

Women and girls in northwest Syria face multiple forms of protection and mental health concerns. Displacement, negative coping mechanisms (such as child marriage), lack of education, and the economic crisis contribute to increasing trauma and depression rates, which trigger higher risk of suicide. Access to psychiatric and psychosocial support remains very limited.⁴⁶

MSNA highlighted that households headed by women were found to have higher economic vulnerability than households headed by men in all four population groups. They have higher food needs and are, on average, more likely to report certain security concerns, highlighting the gendered nature of the risks faced by households in Syria.

Out of school children remain one of the most affected groups, especially adolescents, exposing them to protection and GBV threats such as child labour (mainly for boys) and early marriage (mainly for girls).

► CULTURE AND HABITS

Syria is a collectivist society whereby strong loyalty is shown to family, ethnic and social groups. Nevertheless, while most Syrians identify as Arab, the country also contains much ethnic diversity; recent conflict has stressed sectarian tensions, but most Syrians remain very tolerant and respectful of both religious and ethnic diversity.

The rural-urban distinction has become quite prominent over the last 25 years as the government directed most of its resources to the cities. People from regional areas usually have lower levels of education and are more collectivistic in their community organisation.

Syrian society is quite hierarchical and people tend to adhere to the stratifications between social statuses. A person's wealth, education and profession are the biggest class indicators. One's age also determines the grading of respect in social interactions. Norms about behaviour are substantially influenced by a cultural perception of honour.

The family is the most important aspect of life to Syrians; the reputation, status and honour of a family define its members. Therefore, people will often put their family's reputation before their own needs.

The family dynamic is patriarchal – the father or oldest male has the most authority in the household and is expected to be financially responsible for the family. Families are also patrilineal with descent carried down through the male line; generally only men can inherit assets or pass on the family name.⁴⁷

► INFORMATION AND COMMUNICATION

The destruction to infrastructure during the years of conflict and crisis, continue to have a toll on the telecoms sector in Syria; although urban areas can make use of the network built and maintained by the government-owned incumbent, many underserved remote areas in the countryside are obliged to rely on satellite communications; mobile broadband penetration in Syria is still quite low, despite quite a high population coverage of 3G networks and some deployment of LTE infrastructure.

2021 GDI value		0.825	
GDI change from 2020		-0.001	
	Female	Male	Gender gap
HDI Value	0.503	0.610	-0.107
Life Expectancy at Birth	75.2 years	69.1 years	6.1 years
Expected Years of Schooling	9.1 years	9.2 years	-0.2 years
Mean Years of Schooling	4.6 years	5.6 years	-1.0 years
Gross National Income Per Capita (2017 PPP\$)	1285	7088	-5803

Gender Development Index – © UNDP, 2022

2021 GII value		0.477	
GII change from 2020		-0.001	
Maternal Mortality Ratio	31.0 death/100,000 live births		
Adolescent Birth Rate	38.7 births/1,000 women age 15-19		
	Female	Male	Gender gap
Share of seats in parliament	11.2%	88.8%	-77.6%
Population with at least some secondary education (age 25 and older)	37.1%	43.4%	-6.3%
Labour force participation rate (age 15 and older)	15.7%	70.8%	-55.1%

Gender Inequality Index – © UNDP, 2022

↳ Lifestyles in Syria have been significantly disrupted since the outbreak of the Syrian crisis, and most Syrians are now primarily focused on safety and survival as the people are confronted with the atrocities of the conflict

(Cultural Atlas)

↳ FOR MORE INFORMATION

CULTURE ATLAS
<https://culturalatlas.sbs.com.au/syrian-culture/>

↳ Syrian government used to have full control on the telecommunications and the internet, therefore, people in Northwest Syria are now fully dependant on satellite and/or Türkiye networks. (Shelter Cluster) 2/3 of Syrian homes have satellite dish providing access to foreign TV broadcast.

(Shelter Cluster)

⁴⁶ (ACAPS.org, 2022)

⁴⁷ (Cultural Atlas, [s.d.])

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The number of fixed-line connections increased markedly prior to the civil war in 2011 and in 2020 was at over 16%; mobile-cellular service is just over 95 per 100 persons. Since 2020, some aspects of the telecom sector have experienced a downturn, particularly in mobile device production; progress toward 5G implementation has resumed, as well as upgrades to infrastructure; consumer spending on telecom services has increased due to the surge in demand for capacity and bandwidth; the crucial nature of telecom services as a tool for work and school from home is evident.⁴⁸

State runs TV (2 networks and 5 satellite channels) and radio (3 channels) networks. The first private radio station was launched in 2005. Private radio broadcasters are prohibited from transmitting news or political content.⁴⁹ Radio and television broadcasting in Syria is overseen by the Directorate-General of Radio and Television.⁵⁰

The majority of Syria's publishing industry is concentrated in Damascus. Magazines and journals are run mostly by official or semi-official bodies. Daily, weekly, and fortnightly newspapers are published; all are subject to government restrictions.⁵¹

► TRANSPORT

The motorway system is well-developed in the western half of the country.⁵² The rail network is well-developed and links existed with adjacent countries – Türkiye, Iraq, Jordan and Lebanon – but with the outbreak of the Syrian conflict, they have all been suspended.⁵³ Besides transportation routes, also pipelines for oil crude and derivatives cross the country, in a total of 3,170 km for gas and 2,029 km for oil.⁵⁴

↳ Around 2/3 of Syrian homes have satellite dish providing access to foreign TV broadcast.

(Encyclopaedia Britannica)



Satellite dish, Djeb Madi village – © CRAterre

↳ Transport in Syria is possible by rail, road, air or rivers, and both public and private.

⁴⁸ (CIA, 2022)

⁴⁹ (*Ibid.*, 2022)

⁵⁰ (Encyclopaedia Britannica, [s.d.])

⁵¹ (*Ibid.*, [s.d.])

⁵² (Transport in Syria, 2022)

⁵³ (Syrian Railways, 2022)

⁵⁴ (CIA, 2022)

[2.3] NATURAL HAZARDS

► HAZARDS

- DROUGHT
- HEATWAVE
- FLOOD
- DUST STORM
- EARTHQUAKE
- FIRE
- LANDSLIDE
- VOLCANO
- TSUNAMI



DROUGHT

↘ **Drought hazard** is classified as **HIGH**. Droughts are expected to occur on average **every 5 years**.⁵⁵

Syria ranked among the 25 countries most likely to face extreme water stress by 2040. Since late 2020, the country has been facing a drought that studies estimate to be the worst in 70 years. Driving factors include the impact of climate change on rainfall and temperature. As a consequence, and with upstream countries building dams, Syria is witnessing unprecedented low water levels of the Euphrates River, affecting over 5 million people who rely on it for drinking water, irrigation, and electricity (which, among other effects, rendered 50% of the water and sanitation systems across the country non-operational). The cholera outbreak in October 2022 was linked to people drinking unsafe water from the Euphrates River and irrigating food crops with it.⁵⁶

A severe and long-term drought in Syria has created poor vegetation conditions and drier-than-normal precipitation seasons have persisted in 2022. Water deficits have been exacerbated by unusually dry conditions during the wet season and by abnormally high air temperatures. Combined with low water levels in the Euphrates River and damaged water infrastructure, these conditions have reduced access to water for drinking and domestic use for millions of Syrians, triggered substantial harvest and income losses, an increase in

waterborne diseases and malnutrition rates, displacements, and additional protection and gender-based violence (GBV), especially for women and children.⁵⁷

Studies suggest that the 2007-2010 drought might have contributed to the conflict in Syria, by causing widespread crop failure and mass migration of farming families to urban centres.⁵⁸

Precipitation has been projected to decrease by 11 % over the next three decades, especially in the winter, spring and fall.⁵⁹



HEATWAVE

↘ **Heatwave hazard** is classified as **HIGH**. Prolonged exposure to extreme heat, resulting in heat stress, is expected to occur at least **once in the next 5 years**.⁶⁰

Average temperatures have been rising in Syria, and the country is now approximately 0.8°C hotter today than it was 100 years ago, having experienced heatwaves in the recent past, with temperatures 8–10°C higher than usual.⁶¹

People living in urban areas are amongst the hardest hit when a heatwave occurs because these are hotter than the surrounding countryside, due to the prevalence of surfaces that retain heat and release it slowly (“Urban Heat Island Effect”). Along with climate change, urbanization is one of the most transformative trends of this century and the last.⁶²



FLOOD

↘ **Flood hazard** is classified as **HIGH**. Potentially damaging and life-threatening floods are expected to occur at least **once in the next 10 years**.⁶³

In northwest Syria, winter storms have the potential to generate devastating floods which have a disproportionate effect on IDPs living in camps and informal sites. Flooding within the IDP camps and sites throughout Idleb and western Aleppo has been widely reported over the last five years.⁶⁴

⁵⁵ (ThinkHazard.org, [s.d.])

⁵⁶ (ACAPS.org, 2022)

⁵⁷ (OCHA, 2022f)

⁵⁸ (Kelley, Mohtadi, Cane, et al., 2015a)

⁵⁹ (RCCC-ICRC-Country-profiles-Syria.pdf, [s.d.])

⁶⁰ (ThinkHazard.org, [s.d.])

⁶¹ (RCCC-ICRC-Country-profiles-Syria.pdf, [s.d.])

⁶² (Singh, R., et al, Heatwave Guide for Cities, 2019. RCRCCC, [s.d.])

⁶³ (ThinkHazard.org, [s.d.])

⁶⁴ (REACH_SYR_Flood_Hazard_Assessment.pdf, [s.d.])

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Globally, sea levels have risen by approximately 21 cm since 1880. This has impacts on coastal areas (where lives more than 11% of the population), with inundation risk, displacement of lowlands, and increased vulnerability from coastal erosion, coastal flooding and damage, and salinity of aquifers.⁶⁵



Floods in IDP site – © Shelter Cluster

DUST STORM

↘ **Dust storm hazard is HIGH.** In the summer months, Syria experiences the most dust storms.⁶⁶

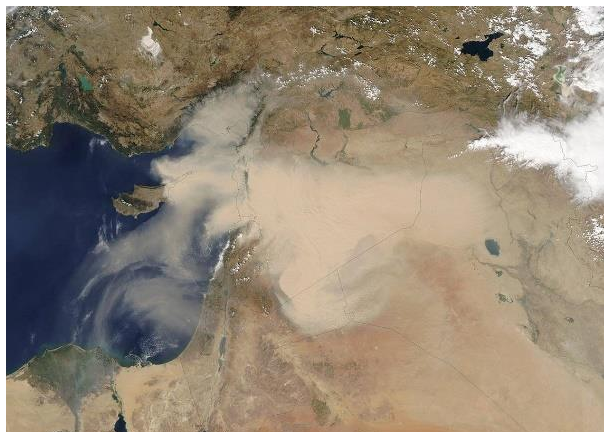
Syria's dry-hot summers are prone to dust storms.⁶⁷ Dust storms are capable of transporting sediment over thousands of kilometres, but due to the MENA region's proximity to the Sahara Desert, the region is one of the dustiest in the world. The highest density of dust sources in the Middle East is found in northern Iraq between the Tigris and Euphrates rivers and along the Syria-Iraq border. The dust from that region is mapped as natural in Iraq and anthropogenic in Syria.⁶⁸

Dust has been associated with leading to and exacerbating climatic events such as storms and droughts. Since dust storms happen during times of extreme heat and dryness, it is likely that climate change exacerbates the conditions that allow large dust storms to form.⁶⁹

Dust deposition has wide-ranging health impacts, and is also associated with many other costs such as crop damage, livestock mortality, fertile soil erosion, infrastructure damage, and interruption of transport.⁷⁰

Dust storms contribute to poor air quality. The World Health Organization estimates that seven million people die from poor air quality every year. In the Middle East and North Africa,

about \$13 billion in Gross Domestic Product (GDP) are lost every year due to dust storms.⁷¹



Middle East dust storm, Sep.2015 (MODIS) – © NASA

EARTHQUAKE

↘ **On February 6, 2023, an earthquake with epicentre in south Türkiye struck Syrian territory, with great impact in the Northwest part of the country. By February 24, a total of 8,553 Syrians were reported to have been killed by this EQ, including 6,760 persons in Syrian territory and another 1,793 in Türkiye, where many more Syrian refugees are believed to have died and been buried.**⁷²

Western Syria lies across the boundary between the African Plate and the Arabian Plate, which consists of the various segments of the Dead Sea Transform.

A total of 266 earthquakes with a magnitude of 4 or above have struck within 300 km of Syria in the past 10 years. This comes down to an average of 26 per year, or 2 per month. A total of 840 earthquakes (mag 4+) were detected within 300km of Syria in 2022. The strongest had a 5.3 magnitude.⁷³

The strongest recent earthquake near Syria occurred on Feb 6, 2023, during the completion of this very document. A first EQ of magnitude M_w 7.8 (and maximum Mercalli intensity of XI: *extreme*) struck at 04h17, with epicentre 32 km west-northwest from Gaziantep, Turkey, thus 115 km north of Aleppo, at a depth of 10 km. A second big EQ struck at 13h24, 95 km north-northeast from the first one, with M_w 7.7. These left widespread damage in an area of about 350,000 km², specially in southeast Turkey and northwest Syria, and were

⁶⁵ (Church, White, 2011)

⁶⁶ (Sand and dust storms in the MENA Region, [s.d.])

⁶⁷ (Faour, Meslmani, Fayad, 2010)

⁶⁸ (Sand and dust storms in the MENA Region, [s.d.])

⁶⁹ (RCCC-ICRC-Country-profiles-Syria.pdf, [s.d.])

⁷⁰ (Sand and dust storms in the MENA Region, [s.d.])

⁷¹ (UNEA-2 | 2030AGENDA-FactSheet_sand dust storms, [s.d.])

⁷² (amar, 2023)

⁷³ (The complete Syria earthquake report (up-to-date 2023), [s.d.])

felt as far as Egypt, Israel, Palestine, Lebanon, Cyprus and the Black Sea Coast of Turkey. Over 10,000 aftershocks were registered in the following three weeks. Power plants, water stations, hospitals and service institutions sustained considerable damage and some are non-operational or closed.



FIRE

↘ **Fire hazard** is classified as **HIGH**. There is greater than **50%** chance of encountering weather that could support a significant wildfire that is likely to result in both life and property loss in **any given year**.⁷⁴

Regions most vulnerable to fires are those extensively cultivated for agriculture (fires likely agricultural in purpose) and forest areas during periods of drought.⁷⁵

Specially in IDP camps and sites, there is a high risk of fires during winter because of the reliance on heating and cooking inside shelters, often in overcrowded tents.⁷⁶



Fire incidents in IDP site – © Shelter Cluster



LANDSLIDE

↘ **Landslide hazard** is classified as **HIGH**. There are rainfall patterns, terrain slope, geology, soil, land cover and earthquakes that make localized landslides a **frequent** hazard phenomenon.⁷⁷



TSUNAMI

↘ **Tsunami hazard** is classified as **MEDIUM**. There is more than a **10%** chance of a potentially-damaging tsunami occurring in the next **50 years**.⁷⁸

Risks are located only on the Mediterranean coastal area.



EPIDEMIC

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.⁷⁹

Outbreaks of cholera and measles have been reported over the last years, and tuberculosis remains a significant threat to human life among the most vulnerable. Leishmaniasis is endemic in Syria.

The last case of polio detected in Syria prior to the conflict was reported in 1999. Due to the crisis-induced deterioration in health services, Syria experienced two outbreaks of wild poliovirus in 2013 and 2014, and a vaccine-derived poliovirus in 2017, which were controlled in due time. While Syria is classified, according to the International Health Regulations, as a State no longer infected by either variant of the disease, it remains vulnerable to reinfection.⁸⁰

As droughts become longer and more intense, incidences of nutritional deficiencies are expected to increase, too. Drought-tolerant rodents can also be vectors of disease. Waterborne diseases such as typhoid and severe diarrhoea can flare up with irregular rainfall.⁸¹

FOR MORE INFORMATION

THINK HAZARD

<https://thinkhazard.org/en/report/238-syrian-arab-republic>

ACU - ASSISTANCE COORDINATION UNIT SYRIA EARTHQUAKE INJURY ASSESSMENT

https://acu-sy.org/imu_reports/syriaearthquakeinjuryassessment/

CAMP COORDINATION AND CAMP MANAGEMENT CLUSTER FIRE PREVENTION AND RESPONSE GUIDANCE NOTE

<https://ccmcluster.org/documents/fire-prevention-and-response-guidance-note>

⁷⁴ (ThinkHazard.org, [s.d.])

⁷⁵ (Faour, Meslmani, Fayad, 2010)

⁷⁶ (ACAPS | Syria-anticipatory-winterNW_2022, [s.d.])

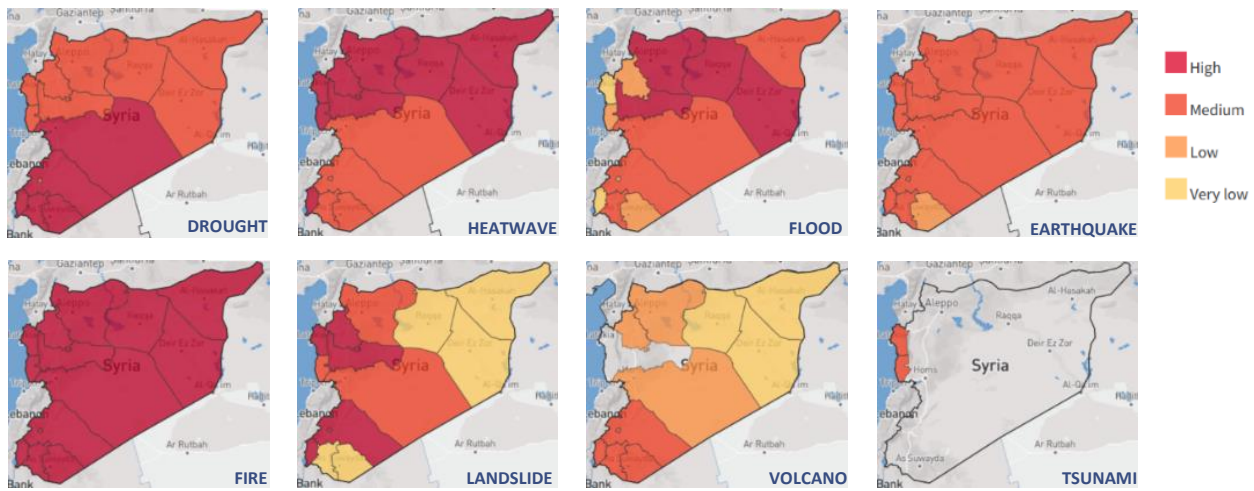
⁷⁷ (ThinkHazard.org, [s.d.])

⁷⁸ (*Ibid.*, [s.d.])

⁷⁹ (OCHA, 2022f)

⁸⁰ (World Health Organization | Syria - Annual report 2021, [s.d.])

⁸¹ (RCCC-ICRC-Country-profiles-Syria.pdf, [s.d.])



► **DISASTER RISK REDUCTION MECHANISMS (DRR)**

In 2022, the key drivers of humanitarian need in Syria were related to conflict, economic crisis, the COVID-19 pandemic, and the water crisis and drought like conditions. In 2023, most of those elements are expected to remain the main drivers of humanitarian need. The COVID-19 pandemic is not expected to remain a main driver, although the low level of vaccination is a concern. In addition, the geopolitical dynamics and push for refugees to return to Syria could have serious implications on needs across the country, as will the recently declared cholera outbreak.⁸²

> **Risks related to hostilities and geopolitical context:** Although hostilities in general have been declining over the last three years in Syria, the security situation remains highly dynamic, active and prone to escalation, particularly in areas of mixed or contested control and in the vicinity of the frontlines. Hostilities are likely to remain one of the key underlying causes of humanitarian need, whether due to new hostilities or protracted needs resulting from hostilities in previous years.⁸³

> **Risks related to displacement:** In 2023, displacement trends are expected to remain similar to those observed 2022, driven mostly by potential military operations and conflict activity in hotspots and frontline areas (particularly in Idlib, Aleppo and Dar’a Governorates). Up to 400,000 people could be displaced during the year. In addition to hostilities, displacements are increasingly reported to be driven by worsening socio-economic conditions that push individuals and families to seek better employment opportunities and living conditions. Any

potential new displacements are likely to result in further inflows to already overcrowded last resort IDP sites, particularly in north-west and north-east Syria, and will exacerbate GBV risks. In parallel, up to 180,000 displaced people could return to their areas of origin in the next year following temporary displacement at the peak of hostilities, with families often returning shortly after leaving their homes. These projections are based on the movement patterns of IDPs and spontaneous returnees over the past years across Syria, as well as trend analysis of hostilities and projections from readiness and response plans.⁸⁴

> **Risks related to the protracted nature of the crisis:** Women and girls will continue to face compounded forms of violence when exposed to overlapping and mutually reinforcing forms of discrimination and social exclusion, especially divorced and widowed women, adolescent girls, women and girls with disabilities, older women, and displaced women and girls. Boys below 12 years of age, adolescents and adult men also face distinct protection needs and risks, as they account for the vast majority of victims of explosive ordnance, mainly due to their frequent involvement in farming, herding, moving and travelling. The limited options for durable solutions will exacerbate protection risks and the inability of IDPs (especially in informal camps) and returnees to meet their basic needs, including concerns related to HLP rights.⁸⁵

> **Shelter designs** must not increase the vulnerability of occupants to natural hazards such as storms or disease, neither increase risk of death or injury. Location is as important

⁸² (OCHA, 2022b)

⁸³ (*Ibid.*, 2022b)

⁸⁴ (*Ibid.*, 2022b)

⁸⁵ (*Ibid.*, 2022b)

as design – poorly located shelters can increase the risks faced by occupants to flooding or fires or exposure to severe weather conditions, while well located shelters can reduce exposure to hazards.

Design should be based on the kind of event that is likely to occur within the lifespan of the shelter. Dignified shelters should be able to withstand expected events such as annual heavy rainfall or snowfall, strong winds and wet muddy environments during the winter season and strong sun and heat during the summer season. Shelter materials should also

be fire resistant were possible and/or adopt fire mitigation measures as part of site planning and camp management.⁸⁶

Lightweight structures are less likely to cause fatalities in the event of collapse, yet, they are more vulnerable to strong winds. Designs should calculate the wind forces and directions toward each node of the structure. Shelter designs should consider that those living in them are likely to make alterations, extensions or upgrades over time. Continued ongoing monitoring is required in order to ensure that any modifications to structures do not become hazardous to those living in the shelters.⁸⁷

[2.4] ENVIRONMENT AND CLIMATE CHANGE IMPACTS

↘ THE DATA IN THIS SECTION REFERS TO WHOLE OF SYRIA AND NOT JUST NWS

↘ Snowstorms, cold weather, strong winds, rain and floods are expected to have a serious humanitarian impact on people's lives, wellbeing, and access to services. Over 2.87 million people remain displaced in northwest Syria and around 1.82 million people are living in around 1,400 IDP sites. These sites often lack adequate shelter, infrastructure, and basic services.⁸⁸

In 2021, climatic and human-caused shocks affecting natural resources, particularly water, have intensified. Erratic rainfall in combination with historically low water levels in the Euphrates River have not just reduced access to water for drinking and domestic use for over five million people, but also triggered substantial harvest and income losses, decreased hydroelectricity generation, an increase in water-borne diseases, and additional protection risks. In the mid to long-term, these developments are expected to have serious and cumulative impact on health, food insecurity, malnutrition rates, as well as the protection environment, with potentially irreversible consequences.⁸⁹

Temperatures will continue to rise in Syria and are expected to be at least 2°C higher by 2050. Warming is expected to be more dramatic in the interior regions compared to the coast. Models predict that extreme temperatures will increase and the hottest days could be 4–10°C hotter by the end of this century, depending on the magnitude of global climate change.⁹⁰

Reduction in precipitation and elevation of temperatures will be the two main revealed consequences of climate change in Syria. Presently, drought, heat waves and dust storms are the major present environmental hazards associated with climate variability.⁹¹ Syria ranked among the 25 countries most likely to face extreme water stress by 2040. Since late 2020, the country has been facing a drought that studies estimate to be the worst in 70 years. Driving factors include the impact of climate change on rainfall and temperature.⁹² Several studies suggest that both the frequency and intensity of droughts, especially near the Mediterranean Sea, will increase as global temperatures rise. With much of the infrastructure in ruin and minimal governance because of the civil war, Syria is more vulnerable than ever to future climate-influenced shock.⁹³

↘ The Syrian 11th Five-Year Plan 2011-2015 includes several sectoral targets related to climate change, notably aimed at providing a sustainable transport matrix, enhanced renewable energy production, and the sustainable development of rural areas.⁹⁴

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.⁹⁵

More than 70% of arid land area in Syria is highly vulnerable to degradation. Another 23% (semi-arid lands) is vulnerable but

⁸⁶ (X-Border Operation - Turkey Hub, 2020)

⁸⁷ (Shelter Cluster | Northwest Syria -Turkey Hub, 2023)

⁸⁸ (OCHA | NWS winterization_plan_2022-23.pdf, [s.d.])

⁸⁹ (OCHA, 2022c)

⁹⁰ (RCCC-ICRC-Country-profiles-Syria.pdf, [s.d.])

⁹¹ (Faour, Meslmani, Fayad, 2010)

⁹² (ACAPS.org, 2022)

⁹³ (RCCC-ICRC-Country-profiles-Syria.pdf, [s.d.])

⁹⁴ (Climate-Laws.org, 2023)

⁹⁵ (OCHA, 2022f)

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with a lesser degree. Main forms of land degradation include wind/water erosion, sand encroachments, and salinization.⁹⁶

Globally, sea levels are projected to rise by an additional 20–30cm by 2050 and 50–200cm by 2100. This poses a significant

threat to Syria’s coastal communities and infrastructure, and increases the risk of saltwater intrusion along the coast⁹⁷ having an impact on urban areas, and agriculture zones.⁹⁸

[2.5] HUMANITARIAN CRISIS AND SHELTER SECTOR RESPONSE

► IDPS, REFUGEES, RETURNEES

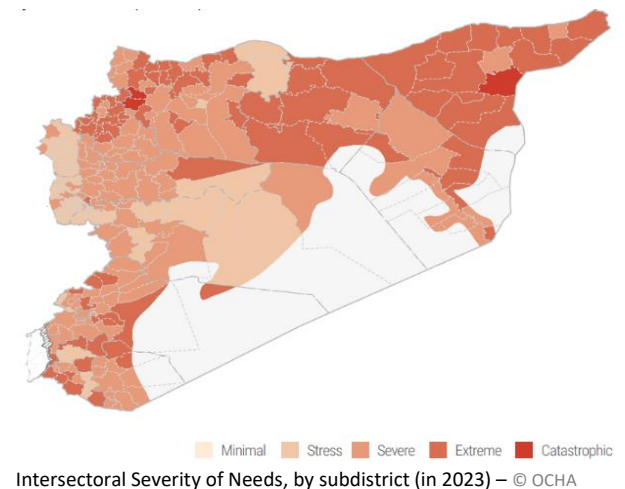
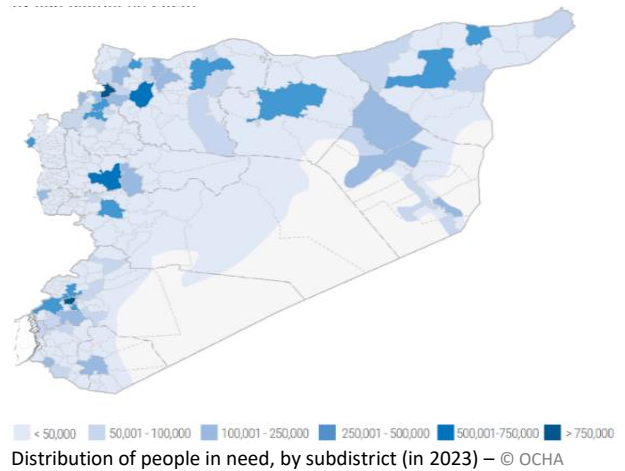
➤ **Over 1.8 million IDPs living in 1,421 last resort IDP sites in NW Syria need assistance in 2023, an increase from 1.7 million in 2022.⁹⁷ An additional 278,400 IDPs who reside in over 260 sites in northeast Syria also need assistance; the population in ten camps with a static camp management has increased by 4,320 individuals since the beginning of 2022, while the rate of new arrivals significantly outweighing departures, and with 7,000 individuals on camp waiting lists. In northwest Syria, 76% of IDP sites do not have a camp management system in place. Of the 1.8 million people living in IDP sites in NW Syria, 23% are women and 56% are children.**

The humanitarian needs in Syria are severe across all sectors, with significant health, education, WASH, shelter, protection, and food needs. Years of conflict have left healthcare centres, hospitals, schools, and water and sanitation systems damaged or destroyed⁹⁹

The ongoing conflict in several parts of the country continues to leave people in fear of attacks and at risk of new displacement. While large-scale hostilities have subsided following the March 2020 Idleb ceasefire agreement, localized hostilities and lasting impact from previous clashes have continued throughout 2022. Artillery shelling, air strikes, land mines and unexploded ordnance devastate civilians and humanitarian activities. With ever-increasing pressure in neighbouring countries on refugees to return, the geopolitical context is also creating a climate of fear for millions of Syrians who have known nothing but conflict and displacement. Safety and security concerns remain a gendered issue as women and girls continue disproportionately being affected by various forms of violence.

Protection risks in Syria continue to have a multifaceted and differential impact on all population groups. Displaced women, men, girls and boys in camps, collective shelters and informal settlements are particularly vulnerable and live in some of the

hardest places to reach. They face heightened movement restrictions and restricted access to their rights. Newly displaced and people who have returned to their home areas encounter additional challenges. As of 2022, almost 20 per cent of IDP households report going through five or more displacement cycles, which overstretch coping mechanisms and reduce resilience. The continuous deterioration of the protection situation will result in further neglect of persons with disabilities and the elderly. Child protection risks are equally likely to worsen in 2023, with rights violations (child recruitment, detention, neglect, exploitation, sexual violence, abduction, attacks on schools and hospitals, and denial of humanitarian access) continuously on the rise.



⁹⁶ (Faour, Meslmani, Fayad, 2010)

⁹⁷ (RCCC-ICRC-Country-profiles-Syria.pdf, [s.d.])

⁹⁸ (Faour, Meslmani, Fayad, 2010)

⁹⁹ (ACAPS.org, 2022)

► FOOD INSECURITY

↳ **50% of the population are food insecure.** ¹⁰⁰

According to HNO 2023, The impact of Syria's crisis continues to hinder people's ability to meet their immediate food needs and livelihoods, in a context marked by very complex drivers and contributing factors. This includes economic worsening and weakened local currency, soaring food and non-food prices, as well as drought like conditions and severe agroclimatic fluctuations, water scarcity, and limited energy supply. In addition, food and agriculture commodities prices increase, inflation, lack of purchasing power due to limited livelihood and lack of income sources, population movements that shows no sign of abating, and the Ukraine crisis have had an important economic impact on markets and commodities cost. The needs require the sector and partners to go beyond short-term responses, and to also focus on scaling up early recovery, restoration, protection, and promotion of livelihoods, over the short-to-medium-term, and to work around the entire food system and its related value chains, including water.

Syria's multiple crisis have severely affected the agriculture and agri-food sectors and supporting its resilience has become an urgent national priority. It is important to note that the sharp decline in crop production and the entrenchment of food insecurity during the 2021-2022 cropping season was not only driven by weather anomalies, but also a result of issues with water scarcity and availability, damaged infrastructure and productive assets, disrupted services, and scarcity of energy resources, especially diesel and electricity.

↳ **The drought conditions have affected food and nutrition security in Syria, especially for households that depend on agriculture. Wheat production in 2022, estimated in 1.05 million tons, is less than half of the 2.8 million produced in 2020, leaving Syria short of its domestic needs.** ¹⁰¹

Livestock has also not been spared from the impact of the prevailing water shortage and scarcity, limited access to livestock production inputs especially feed, and the generally unfavourable weather conditions.

The continuous burden of food insecurity and the deterioration of economic stability of households is causing an increase in the use of negative coping mechanisms, which

impacts children in particular. This is translated in increased withdrawal children from school, which in turn, increases risks of child labour and related protection concerns. ¹⁰²

► PERSONS WITH DISABILITIES (PWD)

↳ **In Syria, nearly one in four individuals (24%) aged 2 and above have disabilities. The rate of disabilities inside Syria is significantly higher than the global average of 15% and equates to slightly above 5 million people in need of humanitarian assistance. This number rises significantly in north-east Syria where 40% of individuals have a disability.** ¹⁰³

PWD living in NW Syria face particular challenges and have specific needs that too often remain unmet.

In May 2022, the Humanitarian Needs Assessment Programme (HNAP) reported that the rate of disability increases above the national average for older individuals above the age of 45 years, reaching 92% for people who are above 59 years. Nearly two-thirds (62%) of all households inside Syria have at least one member with disabilities which increases economic challenges due to the increased dependency of PWD on the income of other family members.

Overall, PWD face significant challenges in enjoying an adequate standard of living and leading independent lives. With a lack of accessible services, a lack of reliable data available about barriers, social stigma and no tailored assistance, persons with disabilities have limited means to meet their basic needs. These barriers to services elevate risks of exploitation and abuse and increase poverty.

Disparities exist between men and women with disabilities. Women with disabilities bear the brunt of this unequal distribution, where only 11% of women with disabilities are currently engaged in the labour force when compared to 80% of men with disabilities. Adults with disabilities have received a lower level of education compared with adults without disabilities, where 80% of adults without disabilities have attained at least a secondary-level education compared with 64% of adults with disabilities. Limited job opportunities are available for persons with disabilities often due to consequences of social stigma, low rates of engagement in education, lack of training and employment skills compared to what is available to persons without disabilities. Children with disabilities are in high risk of being abused and neglected due

¹⁰⁰ (UNDP | Syria, 2023)

¹⁰¹ (ACAPS.org, 2022)

¹⁰² (Shelter Cluster | Northwest Syria -Turkey Hub, 2023)

¹⁰³ (Shelter Cluster | Northwest Syria -Turkey Hub, 2023)

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to lack of reliable needs data as well as the significant disruptions in their education and development. Individuals with disabilities living in-camp are more prone to physical barriers, as well as attitudinal barriers (i.e., bullying, abuse and exploitation, discrimination).

Barriers to WASH facilities are also reported, especially by camp populations. Water points are either too far away or premises are not adapted to needs, including slippery ramps or lack of handrails, wheelchair access or ease of use for washing. These are reported to be serious barriers to accessing safe water for 57% of households with a PWD member.¹⁰⁴

► HUMANITARIAN RESPONSE

The strategic intent of the Shelter and NFI (SNFI) cluster in 2023 is to ensure the provision of life-saving support through timely, targeted, and appropriate emergency shelter and NFI assistance, while in parallel, improving resilience and the protection environment through housing and community infrastructure projects that allow access to basic services. The SNFI cluster will aim to strengthen their support to resilience and humanitarian early recovery through both needs and area-based approaches.

Shelter partners will respond to emergency shelter needs, in both last resort sites and substandard residential buildings. The most vulnerable families in last resort sites will be prioritized through interventions such as repair or installation of new tents or distribution and installation of emergency shelters kits. In last resort sites, resilience will be supported through transitional shelters and the implementation of household and site level improvements to enhance flood mitigation and access to basic services. In substandard residential buildings, partners will assist households to build resilience through 'longer term' and complementary activities including, housing repair and rehabilitation, solar energy installation, housing, land and property rights awareness.

Humanitarian assistance provides an essential lifeline to a growing number of Syrians, left with few other options for survival. With fewer savings than before, households across the country rely heavily on purchasing goods on credit, borrowing and remittances. They continue to develop harmful coping mechanisms to meet their needs. Dependence on humanitarian assistance (in kind and cash) has increased since last year, especially for IDPs in camps and newly displaced people. Illegal activities and begging remain widespread, while child labour, child recruitment and child marriage also

continue to have a devastating impact, including on children dropping out of school.

Beyond survival, shelter is an essential contributor to security, personal safety, protection from the climate and resistance to ill health and disease. Ensuring adequate dignified shelter provides HH with a place from which they can address other needs, promoting the use of existing capacities and resources.

Prioritized approach: The response which humanitarian partners will deliver under the 2022-2023 HRP has been prioritized based on comprehensive update of humanitarian needs in the 2023 Syria HNO, which is underpinned by several household-level assessments, key informant-based assessments, as well as a comprehensive review of secondary data. Current needs as well as expected trends in needs and the overall context were cross-checked against existing response capacity (eg. progress towards 2022 sector targets, current operational presence and reach, and resources), and intended response coverage (2022-23 HRP projects).¹⁰⁵

▼ Recognizing that the women, men, girls, and boys living in Syria are the primary stakeholders of the humanitarian response, the response has sought to centre them in its needs analysis and give them a voice in humanitarian planning and response.

Sectors undertook various household, site, and community level assessments, as well as Focus Group Discussions (FGDs) in 2022 to better understand affected people's perception of their key needs, challenges and required types of assistance. In July/August 2022, the MSNA included additional indicators on situation trends and priority needs as perceived by affected households themselves.¹⁰⁶

► HUMANITARIAN RESPONSE IN SHELTER

For a shelter design to be appropriate, it should reflect the needs, local culture, vulnerability and capacities of the affected community and the resources available. Some shelters can be relocated, upgraded by beneficiaries and the materials can be re-used, whilst others may be designed to be built on sites that should not be modified by beneficiaries. The design of a shelter should be reviewed by beneficiaries and their considerations should be taken into account to ensure any proposed shelter is appropriate for the target population. Appropriateness of designs should also take into account HLP

¹⁰⁴ (Shelter Cluster | Northwest Syria -Turkey Hub, 2023)

¹⁰⁵ (Shelter Cluster | Northwest Syria -Turkey Hub, 2023)

¹⁰⁶ (Shelter Cluster | Northwest Syria -Turkey Hub, 2023)

considerations and what is viable within the constraints and permission from public authorities and land owners.

While supporting self-build shelter activities by individual households is preferable in some cases, the scale of shelter needs, HLP considerations and the limited resources of IDP households means that the provision of dignified shelter solutions will require the use of temporary shelter solutions. Any such shelter designs need to reflect the local context, and where possible, local installation technologies and cultural preferences. The shelter should also fit within the wider Dignified and Safer Living Conditions approach to meet the multifaceted needs of the populations.

Concrete and blocks may be used for foundation bases and for WASH facilities, cooking areas and tank stands. Use of concrete for walls and roofing of shelters may be considered in some circumstances, based on HLP, donor approval and stakeholder feedback, but only as a temporary solution, which may be demolished if IDPs leave and return to their homes of origin.¹⁰⁷

FOR MORE INFORMATION

OCHA - 2023 HUMANITARIAN NEEDS OVERVIEW: SYRIA
https://reliefweb.int/attachments/5a13538d-a71c-4688-88c7-4f7ce8f4b4e0/hno_2023-rev-1.12.pdf?_gl=1*mrohr8*_ga*NDQ0MTAxMzM5LjE2NzE1NDA4MDk.*_ga_E60ZNX2F68*MTY3MjU0MzY3OC45LjAuMTY3MjU0MzY3OC42MC4wLjA.

SHELTER CLUSTER – IDP SHELTER SITUATION IN NW SYRIA
<https://sheltercluster.org/x-border-operation-turkey-hub/documents/idp-shelter-situation-north-west-syria-december-2022>



© Shelter Cluster

¹⁰⁷ (Shelter Cluster | Northwest Syria -Turkey Hub, 2023)

[3] Access to land, housing, and basic services

[3.1] OVERVIEW OF ACCESS TO LAND AND HOUSING

► INTRODUCTION

The problems with land documents within the statutory tenure system in Syria are renown. Even prior to the loss, destruction and falsification of HLP documentation during the conflict, there has been over recent decades a widespread practice in rural Syria of not updating formal land records and registries in matters of inheritance or transfer; with the result being that the land market is largely informal and lacking in registration. This means that the land documents which do exist, frequently only have the name of a long dead grandfather still listed as the current owner—and yet there appear to be very few problems associated with this. In addition, the descendants can have the same water rights associated with inherited land as the grandfather did.¹⁰⁸

Housing and infrastructural damage resulting from the conflict has severely affected Syria’s housing stock and economy. An estimated 328,000 dwellings have either been destroyed or severely damaged and are unable to be reoccupied. A further 600,000 to one million were moderately or lightly damaged.¹⁰⁹

In reference to HNO 2023, HLP challenges include sub-standard living conditions of IDPs; illegal or undocumented HLP transactions; disputes; lack of access to land for livelihoods; land contamination with landmines; and lack of documentation.¹¹⁰

Refugees are often without proper HLP documents. There are likely varying reasons as to why many chose not to bring their documents with them when they fled; for example, refugees in Jordan reported that because they heard the Jordanian government would confiscate any Syrian documents at the border, they chose to leave them behind, either hidden somewhere or with someone in Syria. However, given the high rates of infrastructure and housing destruction inside Syria as a result of the conflict, many who left their documents “somewhere else” fear that their documents or residences may no longer exist. Syria’s land registries could potentially contain records of HLP documents, but there is general uncertainty as to what degree registries and cadastres have been damaged or destroyed, and whether they still exist.¹¹¹

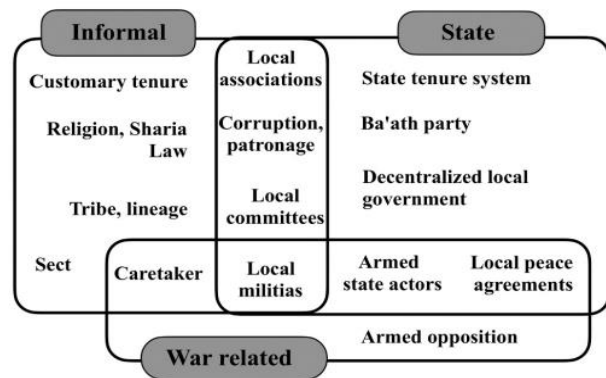
► TYPES OF LAND TENURE

▼ Different tenure systems in Syria: state; customary; religious; hybrids.

▼ Different ways the land is held: ownership; rental; squatting; commons; tribal; lineage; family.¹¹²

A great deal of the international concern regarding land rights in the country has to do with the nearly fifty new HLP-related laws passed by the Syrian regime and their potential to negatively impact land rights in ways that result in large-scale demographic change in the post-war period. These include Decree 66 of 2012; The Tenancy Law of 2015; Housing Law 26 of 2015; and the Urban Planning Law 23 of 2015. Most notable however is Law 10 of 2018 which utilizes a failure to produce the appropriate documents within a certain timeframe, to revert land to the state with no appeal or compensation. Many of these laws (particularly Law 10) could have the effect of obstructing returns and restitution, permanently expropriate lands, and subtract a variety of land rights from certain segments of the population.¹¹³

With the different tenure systems in the country and the different ways that land is held operating in considerable disarray due to the conflict, it can be useful to look at land tenure in the country (from a resilience perspective) in terms of where tenure security is based.



Sources of rural land tenure security in war-affected Syria – © Uruh, J.

¹⁰⁸ (Unruh, 2021)

¹⁰⁹ (OCHA, 2022f)

¹¹⁰ (Shelter Cluster | Northwest Syria -Turkey Hub, 2023)

¹¹¹ (NRC | Syria HLP brief - May2016, [s.d.])

¹¹² (Unruh, 2021)

¹¹³ (Ibid., 2021)

In urban areas, comprising approximately half of the national population, tenurial resilience may be weaker, or exist in different ways than described here, potentially resulting in greater risk of expropriations.

Syria has revealed three broad types of rural land tenure resilience: contextual, indirect, and purposeful. Forms of ‘contextual resilience’ comprise broad interrelated conditions pertinent to certain segments of society or a population. Some of these can be seen as negative with regard to land tenure in stable scenarios, but under the current circumstances act positively with regard to tenurial resilience.¹¹⁴

Contextual Resilience	Indirect Resilience	Purposeful Resilience
<ul style="list-style-type: none"> • Associational life • Local institutional re-attachment of people to lands • Customary & informal tenure <ul style="list-style-type: none"> • Often more valued & useful than statutory tenure • Deficits in statutory tenure <ul style="list-style-type: none"> • Enhances reliance on customary tenure • Default to informal tenure <ul style="list-style-type: none"> • Lineage held land & memory cadasters, • Escapes documentation & location • Opposed legalities <ul style="list-style-type: none"> • Creates opportunities to thwart HLP laws • Tribes <ul style="list-style-type: none"> • Strong land claim effect • Clientelism & corruption <ul style="list-style-type: none"> • Creates opportunities for HLP protection 	<ul style="list-style-type: none"> • Seed and other input distribution <ul style="list-style-type: none"> • Drives/secures attachments to land • Rehabilitation of livestock herds, veterinary assistance <ul style="list-style-type: none"> • Drives claims to grazing lands • Irrigation infrastructure reconstruction <ul style="list-style-type: none"> • Water rights attached to land rights • Reconstruction of economic tree plantations <ul style="list-style-type: none"> • Owners of trees supports claims to lands • Land rehabilitation: landmine clearance, land reclamation, building reconstruction <ul style="list-style-type: none"> • Attaches people to place 	<ul style="list-style-type: none"> • Technology <ul style="list-style-type: none"> • Monitoring lands with social media & digital platforms • Virtual claims-making • Mini-archiving by: <ul style="list-style-type: none"> • Preserves HLP documents • Caretaker role <ul style="list-style-type: none"> • Prevents secondary occupation & expropriation • Rental <ul style="list-style-type: none"> • Hides HLP from govt. • Allows ongoing claim

Summary of tenurial resilience features in rural Syria – © Uruh, J.

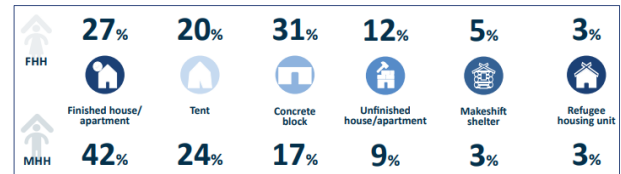
The post-war stabilization and recovery of rural areas may depend to a large degree on restitution of land rights for those who fled and tenure security for both returnees and those who stayed. Given the absence of a conventional large-scale internationally mediated restitution process, and the presence of expropriating legislation and agendas, tenurial resilience might be brought to the fore.¹¹⁵

► **GENDER AND ACCESS TO LAND AND HOUSING**

Displaced women face particular barriers in accessing HLP rights due to persistent discriminatory social norms and practices. Addressing these challenges is fundamental to any early recovery and long-term resilience as it can exacerbate

competition over increasingly dwindling resources and reduce opportunities for more vulnerable individuals.¹¹⁶

► **2 in 3 male-headed IDP households in Northwest Syria are able to afford repairs to their shelter, compared to just over half of female-headed IDP households.**¹¹⁷



Shelter types by sex of head of household – (Shelter Cluster, Dec.2022)

► **FINANCIAL CHALLENGES IN ACCESS TO HOUSING**

Syria’s forced displacement crisis has a significant impact on the housing sector. Large numbers of internally displaced persons have settled in cities, driving rapid urbanization rate increase, from 55% at the outbreak of the war to around 80%, in five years. The number of displaced seeking housing created a huge demand while the significant damage across Aleppo, Idlib and Hama to the existing stock reduced housing supply.

The impact of the destruction of homes represents a reduction in both wealth and the available capital stock. Housing is the main asset for many families. Banks and other financial institutions may incur significant losses due to housing units that were debt financed.

The three main constraints to accessing adequate shelter all relate to insufficient financial resources: lack of money, income or resources to buy tools and material to repair shelters; lack of resources to rent shelter, and the increase in rental prices.¹¹⁸

► **HOUSING POLICIES**

► **THE DATA IN THIS SECTION REFERS TO WHOLE OF SYRIA AND NOT JUST NWS**

The Syrian Arab Republic was among the first Arab countries to include housing issues in government policies since the 1950s. The Public Establishment for Housing (PEH) was created in 1961 and was assigned the roles of securing land to set up housing areas and to provide their utilities, selling and distributing plots in addition to constructing, selling and utilizing housing units whether in-house or by subcontractors. With regard to long term objectives, the housing strategy was

¹¹⁴ (Ibid., 2021)

¹¹⁵ (Ibid., 2021)

¹¹⁶ (Shelter Cluster | Northwest Syria -Turkey Hub, 2023)

¹¹⁷ (Shelter Cluster, 2022)

¹¹⁸ (Arshad, Aoun, 2017)

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focusing until the 1970s on the social role of the state, providing housing for low-income groups with exemptions and long-term instalments which suit their incomes.

In 2002, PEH launched the Youth Housing Project. The number of total applicants was about 60,000 units in different governorates requesting apartments of 60-80 m². The total cost was to be around 0.6 billion USD, 30% of which was funded by the government free of interest. Beneficiaries were expected to pay back in 25 years with monthly instalments not exceeding 30% of the average income in Syria. The apartments were to be delivered over stages (5-7-10 year phase).

While the public sector, represented by the PEH, met its commitments via the Youth Housing Project and other projects (Labour Housing, Savings Housing, and Popular Housing), the cooperative sector could not meet its commitments due to many difficulties, including the scarcity of land needed to

implement its plans. Instead, the cooperative sector has continued its focus on medium and large apartments (over 120 m²) with higher prices. The private sector had not made any contribution or commitment towards approved housing policies and plans. This is mainly due to lack of legal frameworks that organize or promote such contribution. Market indicators and cost variables are the motivators for this sector, and they still favour expensive and spacious apartments for high-income groups.

↳ The public housing sector (represented by PEH) produced 17% of the total planned houses in Syria and provided housing for limited income groups. The cooperative sector provided around 10%. The private sector comprised around 75% of housing activities.¹¹⁹

[3.2] ACCESS TO WATER, SANITATION, AND OTHER SERVICES

↳ THE DATA IN THIS SECTION REFERS TO WHOLE OF SYRIA AND NOT JUST NWS

► WATER

↳ Less than 10% of the population struggle with access to clean drinking water or improved sanitation facilities.¹²⁰

Before the crisis, access to safe drinking water in Syria was estimated at 92% in rural communities and 98% in urban centres. Seven major water systems serve the country's eight largest cities and account for 80% of the country's total water supply, reaching about 9.5 million people. Between 2011 to 2021, with the exception of the system servicing Syria's coastal area, all other essential water facilities suffered direct and severe damages. These were compounded by ten years of inadequate maintenance which intensified their level of fragility. By 2019, annual public water production in Syria had fallen by 40% relative to pre-crisis levels (from 1,700 million cubic metres in 2010 to 1,020 million cubic metres in 2019). Daily per capita water shares fell by 36% in urban areas and by 25% in rural areas, where the share had historically been lower. This already alarming situation significantly deteriorated from 2020 onwards, when electricity shortages in became acute. Public production fell a further 40% and is now at almost a third of pre-crisis levels. Daily per capita drinking

water shares are at 64% of pre-crisis levels in urban areas and at 38% of pre-crisis levels in rural areas. Levels in rural areas – at 30 litres per capita per day – are critically low.¹²¹

Shortage of electricity remains the root cause for water supply systems underperformance or cessation and is mostly related to the significant shortages of fuel for power plants (and water supply systems backup generators where they exist), and to the reduced Euphrates River flow that drastically diminished the hydroelectric potential of the dams. Power outages are common across many rural and urban areas with the electricity being available only for few hours a day. This impacts the functionality of water systems, leading to restricted pumping hours and bypassing of water treatment systems, to increase the quantity of (often raw) water pumped to the networks at the expense of water quality. The extremely low water level in the Euphrates not only affects the production of electricity, but also deteriorates the parameters of the river and irrigation canals' water (turbidity, algae growth etc.), hindering the treatment process, and in some cases disabling the drawing of water. Some large water systems (and associated electricity infrastructure) are split between different areas of control,

¹¹⁹ (Ismail, 2015)

¹²⁰ (World Population Review, [s.d.])

¹²¹ (UNDP | Access Electricity and Humanitarian Needs, 2022)

which challenges equitable water supply access for hundreds of thousands of people.¹²²

Samples taken from a variety of sources, including water networks, ground wells, reservoirs, water tanks, jerry cans and ice blocks, were tested throughout 2021. Of 2322 samples tested, 78.5 % were found to be contaminated.¹²³

There are three main sources of drinking water in Syria all of which depend on electricity to be exploited:¹²⁴

Groundwater: extracted using submersible water pumps, which run on electricity;

Rivers: communities tend to live at higher altitudes than rivers. Thus, electrically powered water pumps are required to pump water upwards. In some instances, like with the Euphrates River in Aleppo governorate, a river can be at a higher altitude than communities, and gravity can be used to move water. Yet, additional pressure is still required to distribute water to more distant households which requires electricity-powered pumps;

Springs: electrically run pumps are needed for distribution.

Syria was already experiencing increased water scarcity even before the start of the conflict, due to climate change.¹²⁵



Water supply in IDP sites – © Shelter Cluster

► SANITATION

By the end of 2021, the lack of electricity had rendered 50% of the water and sanitation systems across the country non-operational. 70% of sewage was discharged without proper treatment, and more than 5 million people lacked access to safe drinking water.¹²⁶

The situation has led many to rely on unsafe open sources and emergency water trucking for clean water. Others have resorted to non-hygienic practices, increasing the risk of spreading waterborne diseases.¹²⁷

¹²² (OCHA, 2022a)

¹²³ (World Health Organization | Syria - Annual report 2021, [s.d.])

¹²⁴ (UNDP | Access Electricity and Humanitarian Needs, 2022)

¹²⁵ (ICRC, 2021)

¹²⁶ (ACAPS.org, 2022)



Ad-hoc sanitation system at Djeb Madi (Lac Assad) — © CRAterre

WASH systems have suffered from damage owing to hostilities, strain from years of functioning at high capacity due to the growing demand, limited or no maintenance, continuous drain of technical staff and poor water resource management, exaggerated by cascade effects of climate change, economic downturn, and electricity and fuel supply crisis. In addition, imposed coercive measures present a huge burden on ease of access to WASH consumables and equipment, with negative implications on the WASH humanitarian response.¹²⁸

More than 1 in 5 IDP households in Northwest Syria share their toilets. This proportion is higher in camps where 1 in 3 share toilets.¹²⁹



Toilet sharing by shelter type (% IDP HH) – (Shelter Cluster, Dec. 2022)

► SOURCE OF ENERGY FOR LIGHTING AND COOKING

In 2020, 95% of the population was estimated to have access to clean cooking.¹³⁰

In rural Syria, balls of sun-dried animal dung mixed with hay, in addition to firewood, have become common fuel for outdoor stoves and ovens, as canisters of cooking gas often take three months to get delivered, and last only 20 days. In the freezing winter, families huddled around fires lit by dung for warmth.

People living in flats in the cities and thus having no means to use firewood, mostly use kerosene stoves for cooking.

¹²⁷ (*Ibid.*, 2022)

¹²⁸ (OCHA, 2022a)

¹²⁹ (Shelter Cluster, 2022)

¹³⁰ (Syrian Arab Republic_Middle East_RE_SP.pdf, [s.d.])

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Kerosene-lit lanterns are also used for light, coping with lack of regular power supply.¹³¹



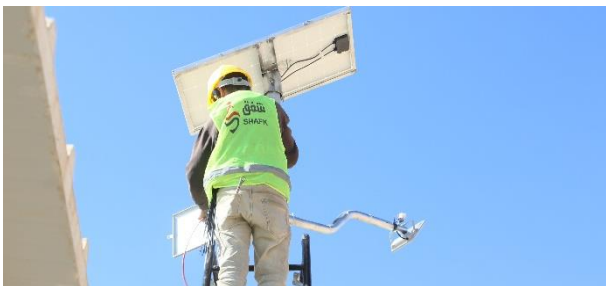
Domestic gas stove – © CRAterre

► ELECTRICITY

Access to electricity (2019):¹³² Total population: 92%; Urban areas: 100%; Rural areas: 84%

Electricity generation sources (2020 est.):¹³³ Fossil fuels: 95.1% of total installed capacity (tic); hydroelectricity: 4.8% of tic; biomass and waste: 0.2% of tic.

The reduced flow of the Euphrates River has drastically diminished the hydroelectric potential of Syrian dams. Low water levels have resulted in reduced energy production capacity, causing power blackouts that have affected more than three million people.¹³⁴ Due to the unreliability of the public network, people have devised innovative methods of procuring electricity for household consumption as well as for business needs. These alternatives include devices harnessing the energy of wind and solar power to produce electricity as well as an extensive network of commercial generators.¹³⁵



Solar panels installation, Arab Boran Camp – © Shafak

Today, solar energy is considered one of life's necessities in northwest Syria, used by everyone from factory owners, to shopkeepers, to ordinary civilians who need it for their domestic electricity needs. The range of solar panel prices and sizes makes them accessible to most people, even those with limited means. Solar panels of an array of different models and

sizes can be seen along the length of the Syria-Turkey border and cover the northwest region. They are arranged in twos and threes, on the rooves of houses and balconies and in front of the tents of the displaced. Densely packed rows are positioned close to farms and factories.¹³⁶

Lack of electricity has a substantial, negative impact on aspects such as Health, Education, Food Security and Agriculture, Nutrition, Shelter and NFIs, Early Recovery and Livelihoods, Protection, and Emergency Telecoms and Logistics.

► Despite the advantages of solar energy in securing electricity for domestic, commercial and agricultural use, it also carries deadly risks. Many have died or suffered severe burns due to equipment misuse.¹³⁷

► WASTE MANAGEMENT

Syria is one of the countries lacking updated and reliable data on the composition and generation of household solid waste. This issue and its adverse environmental impacts were present in Syria even before the conflict began. In this context, around 80% of the domestic solid waste was disposed of at illegal dumpsites, which were situated in the surrounding areas of cities. Due to the damage of waste management infrastructure, a massive amount of solid waste has accumulated in the roads within the Syrian cities. In many cases, the local authorities have resorted to alternative methods such as outdoor burning or illegal dumping.¹³⁸

Children collect garbage at dumpsters, select whatever can be recycled, such as plastic or metal cans, and then sell it.¹³⁹

According to the World Health Organization (WHO), waste accumulations in streets are breeding sites for pests such as mosquitoes, flies and mice that could transmit many diseases such as Leishmaniasis, causing epidemics and outbreaks, particularly in emergency and conflict situations.¹⁴⁰

► ACCES TO PUBLIC FACILITIES

Damaged and disrupted by the several years of conflict, water, sanitation and hygiene services and facilities have impacted the safe and regular access of about 14.6 million people to safe water, among other WASH services, while 7.6 million people are estimated to be in acute need for WASH services.¹⁴¹

¹³¹ (Ali, 2022)

¹³² (CIA, 2022)

¹³³ (Ibid., 2022)

¹³⁴ (ACAPS.org, 2022)

¹³⁵ (Arshad, Aoun, 2017)

¹³⁶ (Mansour, 2022)

¹³⁷ (UNDP | Access Electricity and Humanitarian Needs, 2022)

¹³⁸ (Noufal, Yuanyuan, Maalla, et al., 2020)

¹³⁹ (ABC News, [s.d.])

¹⁴⁰ (Clearing rubbish in Syria, 2013)

¹⁴¹ (UNICEF, [s.d.])

[4] Description of local housing and settlements

↳ THE DATA IN THIS SECTION REFERS TO WHOLE OF SYRIA AND NOT JUST NWS

[4.1] HOUSEHOLDS' DESCRIPTION

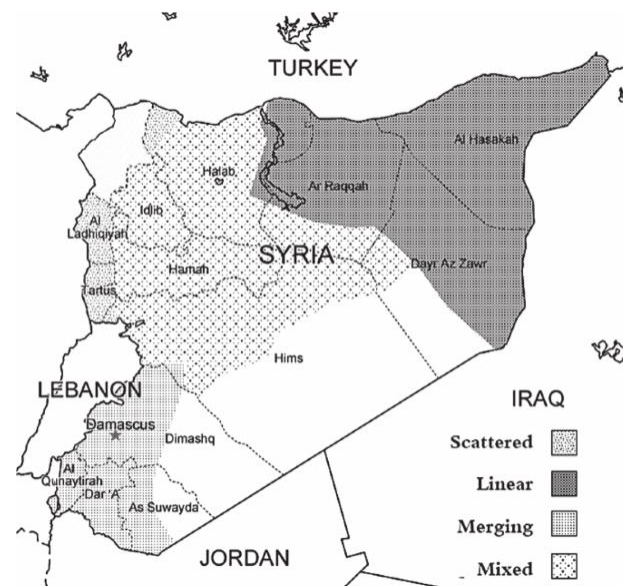
According to the 2006 Multiple Indicator Clusters Survey (MICS)¹⁴², the average Syrian household is composed of 5.7 members: 2% of HH are composed of only one member, 18% of 2-3 members; 32% of 4-5 members; 48% of 6+ members.

81% of households have at least one member under 20 years of age, and 17% of households have at least one member aged 65 years or over. Cumulating those two indicators (at least one member under 20y and one member over 65y) are 7% of HH.

[4.2] SETTLEMENTS

↳ Until the Ottoman era, the settlement of Syria was concentrated in the *Ma'moura*, around the historic centres, towns and agricultural villages located on the fringe of the "fertile crescent", an area of sedentary people, while the large part of the territory, the *Badya*, located east of the *Ma'moura* in the steppe zone, was a space of nomadism reserved for Bedouin herders.

The Mongol invasions of the 14th century pushed the sedentary populations of the arid margins westward. During the 18th and 19th centuries there was a widespread abandonment of villages after they were ravaged by nomadic tribes. In the middle of the 19th century, when the reoccupation movement began from which the contemporary villages of the arid margins emerged, the western limit of the *Badya* was located on the Homs-Aleppo axis.¹⁴³



Distribution of the different forms of villages – © Al Asali

► RURAL AREAS

In areas of traditional rural settlement, the choice of a village site is usually determined by the availability of water. Some of the villages in the mountains, however, have given priority to the requirements of defence and fortification. Individual scattered houses are an inexistant phenomenon; grouping seems to be a consequence of both physical and social climate.¹⁴⁴ Village dwellings stand close together, and the house extends horizontally and village streets are extremely narrow. Usually, there is a small central common space overlooked by a minaret.

In rural areas, agricultural machinery, introduced on a large scale after World War II, caused unemployment and drove many villagers to the cities.¹⁴⁵

Natural, human, and social factors affect the conditions of the formation of a village; thus, and except for the villages planned in advance, we can find three main forms of villages in Syria: **merging, scattered, and linear.**¹⁴⁶

> **Merging Form:** clustering of houses around a chosen spot within agricultural lands. The settlement area is separate and different from the surrounding agricultural lands. This form can be identified on maps as villages being visible gatherings of structures in specific positions separated by agricultural

¹⁴² (UN, 2022)

¹⁴³ (Bendakir, Meftah, Margueron, et al., 2008)

¹⁴⁴ (Aljundi, 1984)

¹⁴⁵ (Britannica | Syria - Settlement patterns, [s.d.])

¹⁴⁶ (Al Asali, 2016)

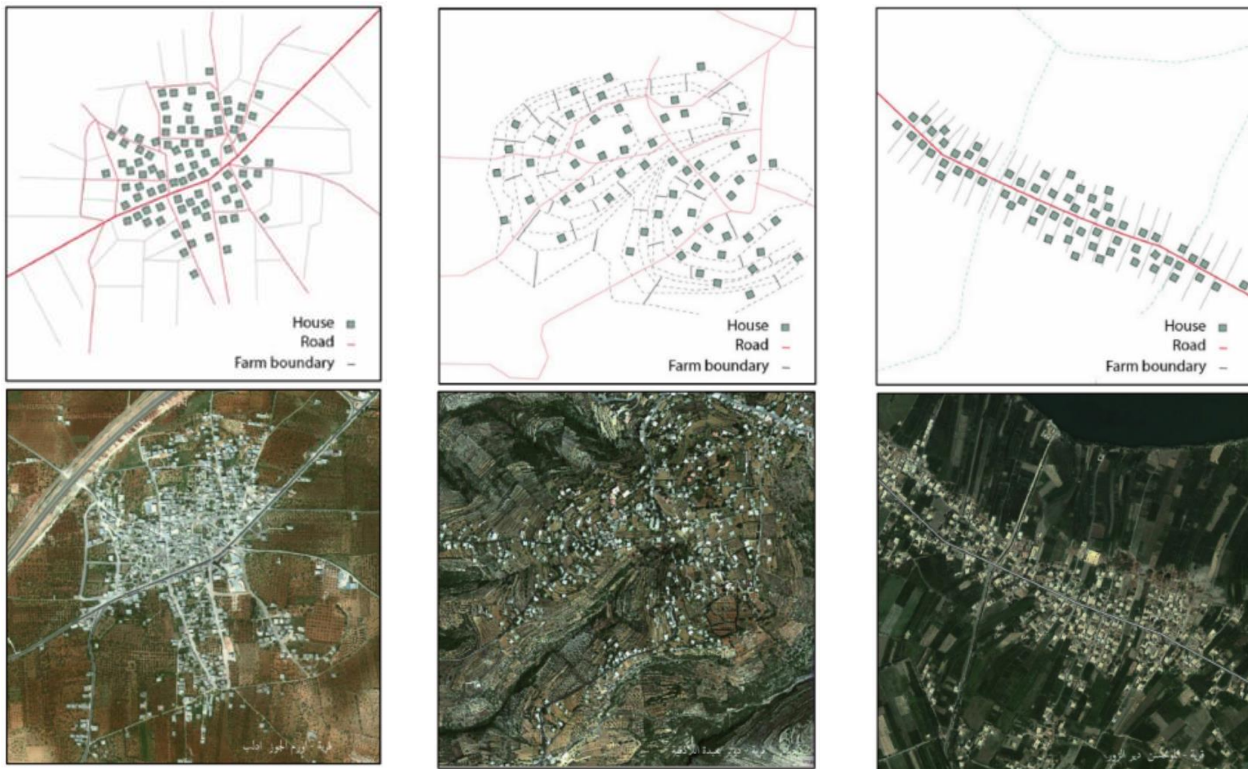
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lands and fields. Most villages in the southern region follow this pattern, making them look like congregations linked by a road network. This form can also be found next to other forms in the central region.¹⁴⁷

> **Scattered Form:** Houses are scattered across the land with no regular pattern. Here, the village is separated into a number of fields each with one or two houses in them. The scattering form signifies either a strong relationship between the place of work and the place of living so every farmer lives in his farm, or it is a result of the physical features of the land. Scattered villages are common in mountainous and coastal regions; they

can also be found on hills, where farms and the houses in them branch out from an ascending or descending road.¹⁴⁸

> **Linear Form:** This form is a product of particular features of the site. Here, buildings are constructed alongside a transportation line- such as a road or a river- that is an important factor of the creation and extension of the village in the first place. This form is also encountered in river basins, especially in the eastern region; however, it is rare for a village to expand directly on the riverbed, as that space is usually reserved for the fields so they can be irrigated easily. Instead, the houses expand linearly on the roads nearby the river, or on a branch of the river that crosses the agricultural fields.¹⁴⁹



Plan and photo of examples of the different village forms in Syria: Merging village (left); Scattered village (middle); Linear Village (right) – © Al Asali

► URBAN AREAS

Ten centuries of Greek and Roman rule left an urban mark still visible in such towns as Latakia, as the urban tradition of Islam appears in such cities as Aleppo. The continuation of old commercial and religious interests enabled the cities to maintain their economic and cultural supremacy under the four centuries of Ottoman rule. Following a period of rapid urbanization in the 1950s and '60s, rural-to-urban migration abated somewhat. Nevertheless, disparities between rural and urban areas, albeit reduced on several fronts, persisted into the 21st century and contributed to Syrians' continued movement from rural to urban areas.¹⁵⁰

▾ Prior to the crisis, over half of Syria's population lived in urban and peri-urban areas.

▾ Approximately one-third of the urban population lived in informal settlements

Norwegian Refugee Council, 2016

¹⁴⁷ (*Ibid.*, 2016)

¹⁴⁸ (*Ibid.*, 2016)

¹⁴⁹ (*Ibid.*, 2016)

¹⁵⁰ Britannica | Syria - Settlement patterns, [s.d.]

In the past, the cluster form of settlement was the main type of urban design in Syria and due to the Islamic influence, the outside façades of the whole residential settlement were quite similar and simple following the humbleness, simplicity and egalitarianism principle in Islamic doctrines. In contrast, the public buildings were different and designed as distinctive and symbolic edifices and were used as a landmark of the city. Although the dominant type of settlement was the cluster buildings, there was another type of residential settlement on the Syrian coast – the individual type with surrounding farm – which could be seen especially in rural areas.¹⁵¹

The urban fabric in most of the Syrian cities that lived, flourished, and developed in the past is still very much alive today, distinguishing itself through its intimacy and density. It plays with space and volume, shade and light, accessible and blocked roads, providing the desired environment and social needs of the inhabitants. Roads wind between residences, narrowing as they shift from public to private areas. Private spaces open onto an inside courtyard, allowing for a restrained amount of sun to come in, ensuring the right amount of ventilation in hot summers. Sub cultural groups in Syria played an essential role in forming the traditional housing design with slight differences between inland and coastal areas. These builders and users have exploited the locally available building materials and the construction techniques they inherited from thousands of years of civilization.¹⁵²

The current city is new in many aspects, material and immaterial. This expanding society is characterized by a gradual reduction in the size of family units. The appearance of the city reflects much more than before social and economic inequalities, voluntarily displayed. In the last few decades housing design has developed out of sync with current cultural change. Multi-storey building is the predominant housing type in Syria, which is designed generically speculatively by designers or developers regardless of users. Moreover, while uncontrollable expansion of informal settlement areas might be built by people's desire and choice, this occurs under unsuitable circumstances as it is an illegal process which forces them predominantly to implement cheap buildings regardless of real cultural needs.¹⁵³

Depending on the context, some strategies implement a mode of production and functioning of the city, "pre-legal" rather than illegal, commonly referred to as informal. The promoters of informal settlements are the inhabitants themselves, assisted by agents whose status may be official but whose function is not institutional in this case. These modes of production of space replace official town planning or complement it. The informal can be implemented in a legal or illegal context, and it can develop essentially as a consequence of legal acts.¹⁵⁴

↳ Informal mechanisms

The strict application of master plans and the control of space seem to be unachievable objectives. The high demographic growth and the resulting population movements, cause a demand for housing that neither institutions nor private investors seem to be able to meet. The call for the informal is inevitable.

Informal mechanisms can be classified according to the procedures and the type of space produced:

- neighbourhoods grouping vast subdivisions, covering tens or hundreds of hectares, actual collective solutions developed on a large scale. Here, almost all of the morphological and social characteristics and the relationship with the administration come out of legality while using the law; products of governance dysfunctions;
- illegal solutions developed in a legal context: collective or individual and diffuse solutions, well represented by the "small" cheating on building regulations in "legal" neighbourhoods or almost cultural behaviours, such as the *de facto* privatization of sidewalks in front of stores.

Boissière, David, 2014

↳ MAIN TYPES OF HOUSING IN URBAN AREAS

- Master planned areas
- Expansion areas
- Informal settlement areas

Ismail, 2014

¹⁵¹ (Ismail, 2015)

¹⁵² (CORPUS Levant, 2004)

¹⁵³ (Ismail, 2015)

¹⁵⁴ (Boissière, David, 2014)

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▶ IDP SETTLEMENTS

The following contents are extracted from the document “Shelter Types”, by the X-Border – Turkey Hub Shelter Cluster.

> Settlement types

There are four types of IDP settlements: **Informal/spontaneous site**; **Camp**; **Reception Centre**; **Residential urban area**.

> Shelter types

There are five types of shelter:

Solid/finished residential buildings: it can be houses, apartment blocks, or even hotels, as long as the building has doors, window and sanitation, even if there is no plastering/painting.

Substandard building: unfinished residential building; damaged residential building; non-residential structure (garage, farm house, shop).



Substandard buildings: damaged houses – © NWS-XB-Hub Shelter Cluster



Solid/finished residential buildings – © NWS-XB-Hub Shelter Cluster



Substandard buildings: unfinished houses – © NWS-XB-Hub Shelter Cluster



Substandard buildings: unfinished apartment blocks – © NWS-XB-Hub Shelter Cluster



Collective centre: religious buildings – © NWS-XB-Hub Shelter Cluster



Substandard buildings: non-residential buildings (garage; shop) – © NWS-XB-Hub Shelter Cluster



Collective centre: schools – © NWS-XB-Hub Shelter Cluster

Collective centres: religious building; school; warehouse; other public building (office, municipal, etc.).

Collective Shelters are mostly communal buildings serving as a temporary shelter for several families. Within a collective shelter, families may sleep in a wide-open space, in individual rooms, or in partitioned units but share the same facilities.

Emergency shelter: tent; makeshift shelter (made with light materials: metal pipes, wood, plastic sheeting, etc.).



Emergency shelter: tent – © NWS-XB-Hub Shelter Cluster

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Emergency shelter: tent – © NWS-XB-Hub Shelter Cluster



Emergency shelter: makeshift shelter – © NWS-XB-Hub Shelter Cluster



Transitional shelter: refugee housing unit (RHU) – © NWS-XB-Hub Shelter Cluster

Transitional shelter: container; refugee housing unit (RHU).



Transitional shelter: container – © NWS-XB-Hub Shelter Cluster



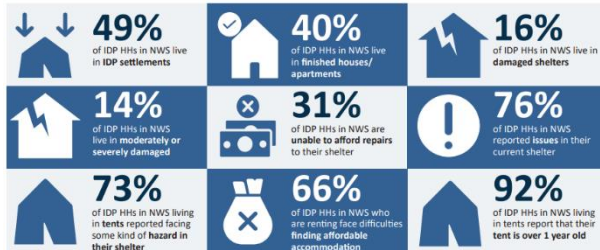
Transitional shelter: concrete block shelter – © NWS-XB-Hub Shelter Cluster

> Occupancy situation

In IDP settlements, there are three types of Occupancy situation: **Owner; Renting or Co-renting; Hosted for free; Squatting** (occupying without authorisation from the owner).

➤ In Northwest Syria, 51% of IDP households live in residential settlements; 42% live in informal settlements; 7% live in planned Settlements.¹⁵⁵

IDP households displaced outside their region of origin are more likely to reside in informal settlements, compared to IDP households displaced in the same region as their origin.



Key findings summary – (Shelter Cluster, Dec.2022)

[4.3] CULTURAL ASPECTS IN HOUSING

The form and architectural expression of Syrian villages do not result from aesthetic research, but from a deep knowledge – albeit often subconscious – of the environment-landscape from which the materials come. The inhabitant-builder has translated his social and cultural needs by building his village in this way, and has established a fragile but real balance between his village and his house on the one hand, and the nature from which he seeks to protect on the other hand.

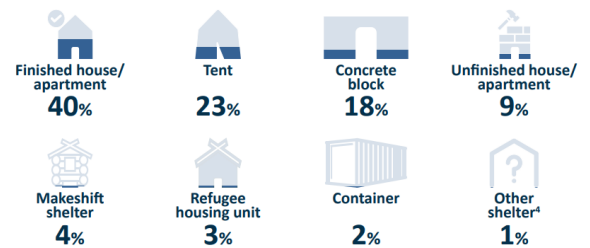
The courtyard of the house is the space where most of the daily life happens – the preparation of daily bread, cooking, provisions, the education of children, animal care, family reunion and reception of guests, etc.



Courtyard house in As-Safira, Aleppo governorate – © CRAterre

➤ More than 1 in 4 IDP households in Northwest Syria live in emergency shelters.¹⁵⁶

27% of households living in IDP settlements in Northwest Syria are obliged to pay rent (Aleppo: 3%; Idleb: 34%). 78% of renting IDP households in Northwest Syria report facing some kind of difficulty when looking for a place to rent.¹⁵⁷



households per type of shelter in NW Syria – (Shelter Cluster, Dec.2022)

The terrace roof is adapted to the climate as well as to the village economy. More than just a cover of the house, it is the place for drying the crops and vegetables, spreading out the bourghul in the sun and pile up the wood supplies. It is also the place to sleep during hot summer nights.

The organization of space, with the layout of the rooms in each set of dwellings, is directly affected by the patriarchal system reigning in the Syrian rural world, where the head of the family controls the budget, makes the purchases, designs the projects, and commands all family members. The head of the family has the most spacious and airy room, often located not far from the entrance gate. From him, each takes his place according to his own dignity, and in rotation of the sun: the eldest son or the first brother comes first, while the youngest are the opposite. Any married man or woman each occupies a room, as well as the mother of the head of the family. Daughters and grandchildren lodge with their mother or grandmother; older boys and teenagers huddle together in a single room with cousins belonging to the same age group.

In the traditional and most present typology of house with courtyard, a set of dwellings apart from the living quarters includes many outbuildings for domestic use: silos, bread oven, chicken coop, storeroom, etc. These buildings are no less important than the dwellings.¹⁵⁸

¹⁵⁵ (Shelter Cluster, 2022)

¹⁵⁶ (*Ibid.*, 2022)

¹⁵⁷ (*Ibid.*, 2022)

¹⁵⁸ (Aljundi, 1984)

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[4.4] SUMMARY OF LOCAL AFFORDABLE CONSTRUCTION TYPES

► VERNACULAR

↳ Building types in Syria can vary according to the region and people's lifestyles. However, two main lifestyles produce a major difference of construction and dwelling: *nomadic and sedentary*.¹⁵⁹

NOMADIC

> **Nomadic Arabic tent** is a nomads' dwelling, made of flexible and portable materials, mainly woven goat hair¹⁶⁰ or woven wool¹⁶¹, taut by ropes from the outside and fixed to the ground with stakes. It can be packed and ready to move within an hour. The tent is very well adapted to desert life as it is waterproof, warm in the cold desert night and a good shelter from the wind.¹⁶²

Of rectangular or square plan, tents can be of different sizes, according to their purpose or function: small tents are usually for household activities, including the kitchen and cooking area, or to stock fodder and store equipment; large tents are the dwelling, and they are split in two parts, one for men and one for women; there is also a section for guests separated from the other sections with a felt or cloth curtain, sometimes with supply bags and fine reeds. The tents are furnished with mattresses, pillows and reed mats, responding to nomad's life necessities which has almost remained unchanged: they still sit and eat on the ground.¹⁶³

Three-generation families usually live in these tents. In some areas, there are groups of tents in which a number of families live together, sharing water and pasture.

Nomadic life and its tent dwelling are disappearing and only exist in the eastern areas of Syria and near the banks of the Euphrates River – in 1980, this type of dwelling was under 7% of total housing in Syria.¹⁶⁴

SEDENTARY

Sedentary lifestyle is related to both cities and the countryside. House types in the city and the countryside also differ according to the geographic location – seaside, mountain, valley, etc. Traditional house design seems to appropriately reflect the culture and social life of Syrian society in the past, when the traditional courtyard house was the dominant type, mainly influenced by Islamic Law.¹⁶⁵

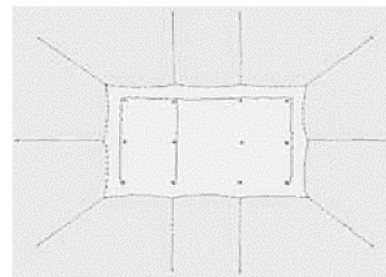
The countryside house, regardless of its form, has basic components that make it completely different from the city house. These components are related to the lifestyle of the countryside that revolves around agriculture, raising livestock, and related activities. Consequently, houses have three main spaces: the **human** space, the **animal** space, and the **food storage** space. These elements, and their different arrangements depending on the climate and seasons, constitute the essential features of the countryside house.



Bedouin Tent – CC wikimedia



Tent (view from inside) – © Corpus Levant



Plan of Nomadic Tent – © Corpus Levant



Bedouin Tent – © CRAterre



Simple house – © Mise/CRAterre

¹⁵⁹ (Ismail, 2015)

¹⁶⁰ (*Ibid.*, 2015)

¹⁶¹ (CORPUS Levant, 2004)

¹⁶² (Ismail, 2015)

¹⁶³ (CORPUS Levant, 2004)

¹⁶⁴ (Collelo, 1988)

¹⁶⁵ (Ismail, 2015)

Between late 18th century and the beginning of 20th century, construction of rural houses in Syria had undergone changes. The alterations in the ways of separating or integrating the three aforementioned spaces affected the form and capacity of rural houses to provide better living conditions. This led to the development of several major forms that rural houses can be categorized by: the **Simple house**, the **Iwan house**, the **Riwaq (arcade) house**, the **Courtyard house** (urban and rural), and the **Lebanese house**. Furthermore, these forms went through other changes in their structures and functions. For example, gabling roofs were added to the courtyard house, and arcades became more common and were added to simple houses as migrants from Crete and mainland Greece brought their construction methods with them.¹⁶⁶

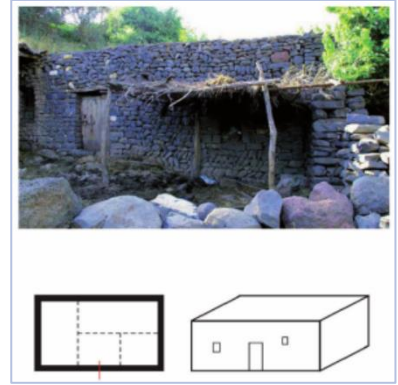
> Simple house

The simplest and the most common form of house in the Syrian rural areas consist of a housing unit of a single family and their food stores, along with a space where animals are kept. The house is fashioned of thick load-bearing walls, built from the materials available at the site. The walls usually have no exterior finishing if the building material is stone, while the insides would have a calcareous finishing. The walls in the simplest form usually do not have large openings except for ventilation and exhaust for smoke. The internal design contains different levels outlining the functional features of the house; bedrooms, living rooms, and food storage spaces are elevated with several stairs that clearly define these areas. Several external activities such as cooking, baking, sleeping during summer, and processing the agricultural products are designated to an outside area with an outhouse often attached to it.¹⁶⁷

The simple house usually has only ground level and a rectangular or square plan, and it is built with the locally available materials and traditional techniques that have proven to be effective and ensuring proper comfort, security and durability.

Foundations are either of stone and mud mortar, or the walls may be directly laid on the ground, when it is rocky. The walls are usually load-bearing (taking the load of the roof without any further structural elements than the wall itself) and they may be of stone, when available, or of adobe. According to the type of soil and the local climate (namely rain), adobe walls usually have a first few layers in stone, to protect the adobes from rain water, moisture or ascending humidity from the ground. When stone is not available locally, a sort of plinth is made at the base of the wall, by adding some adobes all around to create bigger mass, that must be repaired and replaced regularly (sacrificial mass). Both external walls and partition walls are built at the same time, and mud mortar is used for the laying of either the adobes or the stones. Adobe walls sometimes have stone at the top, for protection.

The roof is usually a flat earth terrace with wood structure, except in places such as the steppes and plateaus of Hamah, some regions of Aleppo and near the border with Turkey¹⁶⁸, where there are pitched roofs, or in cases of earth dome houses. Its structure is composed of wooden joists made with logs of round section, placed parallel and resting directly on the upper edges of the large walls. The distance between these joists, is very variable and depends on their diameter and on the roof that they will support. The width of the rooms is thus limited by the length of the logs,



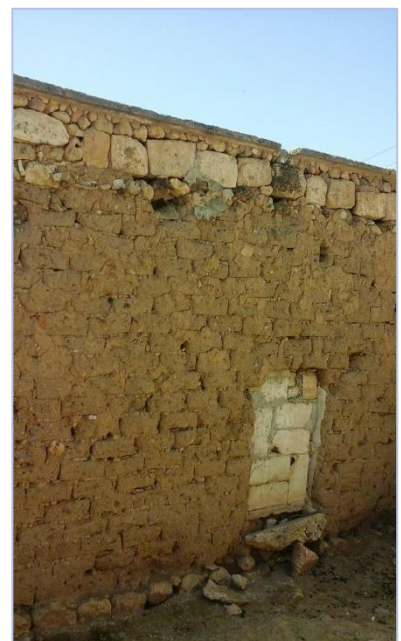
Simple house – © Al Asali



Simple house – adobe walls with stone plinth – © CRAterre



Simple house – stone walls – © CRAterre



Simple house – adobe walls with stone at the top – © QRC

¹⁶⁶ (Al Asali, 2016)

¹⁶⁷ (*Ibid.*, 2016)

¹⁶⁸ (Aljundi, 1984)

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which hardly exceeds 3 m. Among poor families, logs are replaced by more or less twisted trunks, or branches, which further reduces the width of the covered space. In order to allow larger covered spaces, one or two intermediate beams can be laid. This kind of system is widespread, used almost in all regions of the country, except in the steppes and northern interior plateaus. Depending on the size of the room, aligned wood vertical posts may be supporting the wooden beam, which is sometimes replaced either by a clean cut stone arch, or by one or more metal I-beams, this also having an impact on status perception and demonstration.

For covering the terrace, the spaces between the joists and the walls are covered with a layer of brush, then covered with a layer of earth 15 to 30 cm thick. When the families can afford it, they place a straw mat or reed screen between the trunks (joists) and the layer of brush, in order to avoid small brush pieces and dust from keep falling from the ceiling. It also prevents pests of all kind to refuge in the brushwood. Among wealthier families, the brush layer can be replaced by a more elaborated basketry mat made of woven palm leaves, or by wood planks that can be decorated. More recently, panels of plywood, or even compressed cardboard or treated wood coming from the city are also being used by wealthier families.

After tamped it is plastered with mud mortar, creating a kind of glaze to the surface for the water to flow. The weight of the earth ensures the stability of the roof.

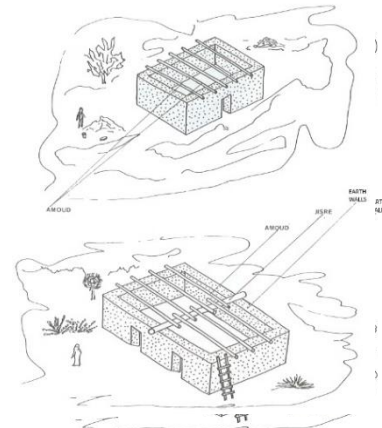
Openings are quite simple and almost always with a very simple wooden structure. In poor families, apart from the opening of the door, the openings are reduced to a minimum, since they can only be obtained with the help of wooden lintels or a stone arch. Sometimes, a few spaces are left between the bricks of a course, which serve to ventilate the house.

> *Iwan* house

This is one of the least common form of house found in the Syrian villages. The architectural definition of *iwan* is a space with a vaulted ceiling that is open to the courtyard on one side. In many contemporary cases, the *iwan* does not exist as a clear structure anymore because it is either connected to the residence to form a closed space, or it is considered a part of the courtyard as in urban houses. The *iwan* is the essence of the domestic life, as attested by the attention paid to the details of the ceiling and the walls throughout. It is the main reception space of the house, and the centre of social communication, similar in function to the arcades. The *iwan* is always located in the centre of the house, surrounded by two rooms used for living and housework; it is sometimes used as a working space, to store food, or to provide shelter to animals as well. The form and function of *iwans* vary between the city and the village; they face south in the countryside houses on higher altitudes, whereas in Aleppo (as in Damascus) *iwans* are oriented towards north to avoid direct sunlight.¹⁶⁹

> *Riwaq* house

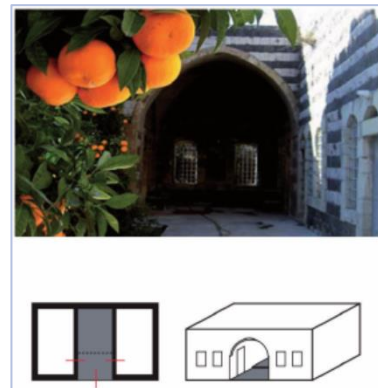
This form is mostly encountered in the central region of Syria, but it can also be found in scattered areas along the coast, as in the southern regions. It features a long arcade covering the entire elevation of the house, either in the ground floor, or in the first floor with external stairs reaching it. The arcade differs from the bench or the porch of a house, as it is a fundamental design element rather than a simple addition. In



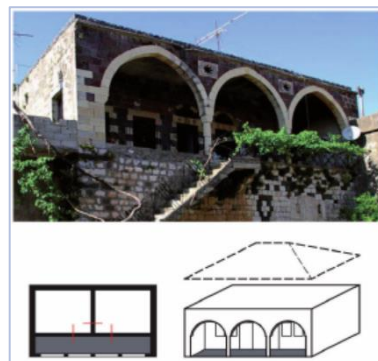
Simple house – roofing – © Aljundi



Intermediary metal I-beam to support joists for bigger width of room – © CRAterre



Iwan house – © Al Asali



Riwaq house – © Al Asali

¹⁶⁹ (Al Asali, 2016)

comparison to other rural houses the elevation of the arcade houses is considered among the most developed when in terms of the attention paid to their form and details. The animals are mostly kept in the ground floor, if the house is a two-story house, or in a separate structure built at the corner outside the house along with the outhouse.¹⁷⁰

> Courtyard house

Common in the plain's regions of north and central Syria, courtyard houses are mostly found in complex form villages. While the courtyard shape is clearly defined, the outline of the house is not planned but rather takes shape as the family expands. The structure extends to the limits of the property with an internal courtyard that all windows open to. The walls are made of the materials available at the site, they could be stone or earth. The courtyard is the external space for most activities and sometimes a part of it is allocated for animals. The courtyard can have an external wall on one side, forming what is called a *hosh*. In this case, the *hosh*, with other houses belonging to relatives lining around the courtyard, forms an external space for all the activities and social bonding between families.¹⁷¹

Generally, the number of inner courtyards in the traditional Arabic house differs; the more luxurious the house, the greater the number of families living in it: some very big houses have two or three courtyards. As for houses with a single courtyard, they differ according to their occupant's economic status; some houses have large courtyards with a fountain in the centre, surrounded by trees, while others, smaller in size have a plain simple courtyard.¹⁷²

The Courtyard House exist both in rural and urban context.

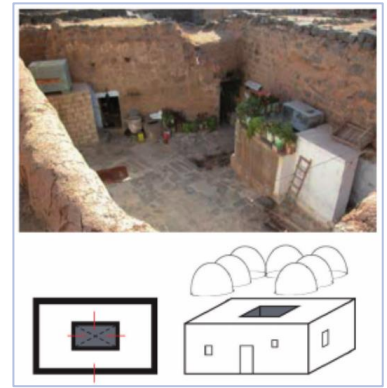
Urban house with courtyard

The traditional courtyard house can be found in all Syrian cities, being one of the most common building typologies in the country.

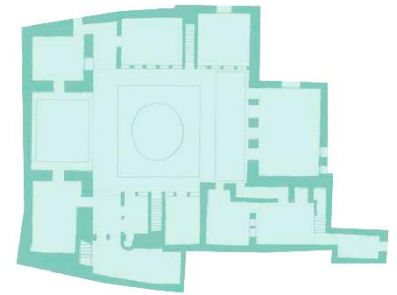
With few and relatively small openings in the external façade, this typology has a large number of openings onto an inner courtyard, around which all the rooms are set, varying in number, size and luxury level. The inner courtyard is often both a garden, where trees, shade and fountains freshen the air, and also the centre of household activities, giving a sense of privacy and privileging the relations between the individuals of the family. The courtyard is accessed from the entrance through a corridor, which ensures that sense of privacy.¹⁷³

Usually, houses have up to 10 m for two storeys. The ground floor is for living rooms and service rooms, whilst bedrooms are on the upper floor. In large houses with over one courtyard, spaces are separated into an area for the owners of the house, another one for guests and a third for servants.

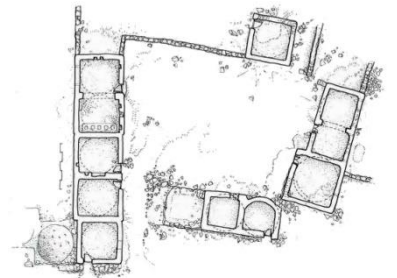
The thick walls and roofs are good insulators and help stabilize room temperature, while the variable roof heights and protruding elements in the facade provide shade.¹⁷⁴



Courtyard house – © Al Asali



Urban Courtyard House, Aleppo – © Corpus Levant



Rural courtyard house, village of El Rwhab, Aleppo Gov. – © CRAterre



Rural house with courtyard – © CRAterre

¹⁷⁰ (*Ibid.*, 2016)

¹⁷¹ (*Ibid.*, 2016)

¹⁷² (CORPUS Levant, 2004)

¹⁷³ (*Ibid.*, 2004)

¹⁷⁴ (*Ibid.*, 2004)

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Rural house with courtyard

In regions such as Aleppo and Hamah, the rooms bordering one or more sides of the rural courtyard are covered with **mud domes**.

➤ Syria is one of the countries in the world offering the most complete picture of the continuity of a tradition that has endured for more than eleven thousand years. The country was the theatre of the first civilizations which allowed the emergence and the expansion of an earthen architecture of the origins and of a singular constructive culture.¹⁷⁵

In some regions, the lack of trees and stones lead to the choice of earth (soil) as the main or single material for the entire construction.¹⁷⁶ Domed architecture is symbolic of the best possible use of earth as a material,¹⁷⁷ namely because they present a solution for roofing that does not require any wood or further materials or elements that earth.

This architectural form responds to climatic, environmental, economic and social conditions.¹⁷⁸ Perfectly adapted to its climate by the thickness of its walls, its insulating material and its conical shape which makes it less exposed to the radiation of the sun, this type of dwelling offers an ideal protection against the weather, especially against the heat.¹⁷⁹

In NW Syria, dome-houses are quite present in areas such as the steppes and plateaus of Idleb and Hamah, and in part of the Aleppo region – that is to say outside the scorching desert where one can obtain the trunks and leaves of palm trees, and far from the banks of rivers, where the trees sometimes offer logs and beams¹⁸⁰ – corresponding to the transition zone between the rain-fed agricultural areas and the dry areas (rainfall limit 200-250 mm/year) and mark the boundary between nomadic lands and settled agricultural areas.¹⁸¹

The dome (*goubba*), a symbol of traditional earthen construction in this region for millennia, has a very variable appearance from one village to another. Built by the peasants themselves, without using a mason or other building materials, it is the least expensive of all the construction methods used by the peasants, and it responds to the economic and social conditions set by the environment.¹⁸²

Built with adobes (sundried earth bricks, locally called *lebn*), the dome has a diameter that rarely exceeds 2.50 m, and a variable height that can reach up to 5 m. The adobes are bond by an earth mortar, in circular concentric superimposed layers of decreasing diameter in a progressive way, with each course of bricks cantilevered beyond the lower course until the void is filled. This is the corbelled dome technique.¹⁸³ Dome's thickness depends on the adobe dimension, but it's usually of 35-50cm at the bottom, and 15-20cm at the top.¹⁸⁴

They are plastered entirely with several thin and successive layers of mud, for protection against the hostility of the climate, and often whitewashed with lime, for decoration and protection – the white colour of the lime reflects solar radiation, thus



Cheikh Hilal village, Hamah Governorate – © O.Barge/Maison de l'Orient, Lyon



Courtyard earthen dome houses, Aleppo gov. – © CRAterre



Dome house in El Koubatine, Aleppo gov. – © CRAterre



Dome seen from the inside – © CRAterre



Dome houses, Djeb Madi (Lac Assad), Aleppo gov. – © CRAterre

¹⁷⁵ (Bendakir, Meftah, Margueron, et al., 2008)

¹⁷⁶ (Aljundi, 1984)

¹⁷⁷ (Bendakir, Meftah, Margueron, et al., 2008)

¹⁷⁸ (*Ibid.*, 2008)

¹⁷⁹ (Aljundi, 1984)

¹⁸⁰ (*Ibid.*, 1984)

¹⁸¹ (Pütt, 2019)

¹⁸² (Aljundi, 1984)

¹⁸³ (*Ibid.*, 1984)

¹⁸⁴ (Mecca, Dìpasquale, 2009a)

keeping the walls from receiving and absorbing less heat surplus during the long summer days.¹⁸⁵ In some cases, flat stones are left protruding on the external face of the dome, that work a permanent scaffolding, allowing an easy access to the upper parts, both during construction as for the periodic maintenance and repair of plasters and coating and their protective whitewash.¹⁸⁶

Regarding its shape, domes can be of three types:

> ground dome

The dome starts from the ground, where the first layer of bricks rests directly, thus without foundation,¹⁸⁷ although sometimes, there can be a stone perimeter base that rises a few centimetres from the ground, on which the dome rests.¹⁸⁸

A few voids are left between two bricks of the same layer, at the bottom and top of the dome, for natural ventilation. Two earthen "pillars" are built projecting from the surface of the outer wall, on which rests a lintel formed of wooden sticks, for the entrance door, which is usually orientated towards the south, when it's a residential dome.¹⁸⁹



Ground Domes in a village in Aleppo governorate – © CRAterre

> high dome

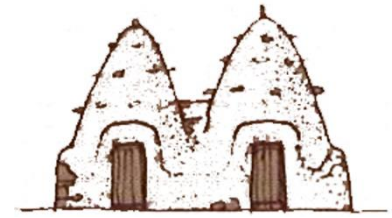
The dome rests on four thick vertical walls that form a cubic base often wider than the dome itself. The height of this cubic base is very variable in size, especially in height, which can go from 70 cm to 2 m. Vertical walls make the use of the room more convenient.¹⁹⁰

The transition between the square formed (in plan) by the vertical walls of the cubic base and the circle formed (in plan) by the dome, is made by using pendentives, or by laying small beams of wood or stone over the corners of the walls, in diagonal, thus "rounding the square".

> truncated dome

Same as the high dome, but without the upper curved point. Instead, a horizontal earthen terrace supported by some trunks covers the upper void of the dome.

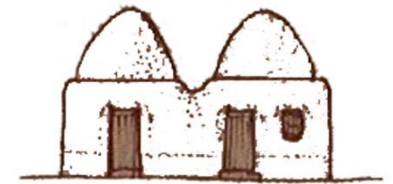
Although the egg-like section of the domes efficiently distributes the stresses on the shell surface, ensuring therefore good resistance¹⁹¹, the top part of the dome remains the most fragile bit, in other, due to its lower thickness. The bigger the diameter of the dome, the more this becomes relevant. Thus, truncated domes came up as a solution that allows wider internal spaces, but avoids the problems inherent to the two existing



Ground Dome house – © Mise/CRAterre



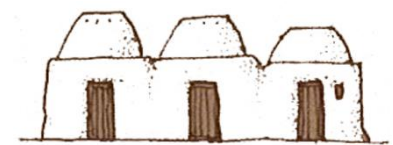
Ground Dome houses – © CRAterre



High Dome house – © Mise/CRAterre



High Dome houses – © CRAterre



Truncated Dome house – © Mise/CRAterre



Truncated Dome houses – © CRAterre

¹⁸⁵ (Aljundi, 1984)

¹⁸⁶ (Bendakir, Meftah, Margueron, et al., 2008)

¹⁸⁷ (Aljundi, 1984)

¹⁸⁸ (Mecca, Dipasquale, 2009a)

¹⁸⁹ (Aljundi, 1984)

¹⁹⁰ (*Ibid.*, 1984)

¹⁹¹ (Oliver, 2003)

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options: the problem of wood scarcity and its high cost, when building terrace roofs, and eventual structural problems, if choosing to build wider domes.¹⁹²

For any of the three aforementioned typologies (ground dome, high dome, truncated dome), the basic unit is of one single domed-room. Grouping of those units might be in **clusters** or in **lines** (row of units, usually along one or more of the border walls of the plot), and can either keep those units independent, each room having its own door to the exterior, or combine them by leaving an arched opening in the median wall to make communication between the rooms.¹⁹³

These houses are generally divided into a number of sections: the day sections, with rooms for men and rooms for women, the kitchen and service rooms, including the "tanour" (traditional oven), the bedroom section and a special area for animals, with a stable and animal stall.¹⁹⁴

A basic earthen dome courtyard house is usually composed by one or more rooms with various functions (living, sleeping or for visitors), along with external or independent kitchen, bath, store, cattle shed, toilet, fences, garden, dovecote, bread oven (*tannur*), stage (*mastaba*), and well.¹⁹⁵



Top of truncated dome – © CRAterre



Holes left for ventilation – © CRAterre



High dome with mud plaster – © CRAterre



Different domes – © CRAterre



Dome house with dovecote in-between domes – village of Er-Rouihab – © CRAterre



Inside a dome house – © CRAterre

Some of these domestic activities other than the living quarters take place in earth domes that are mostly built by women, using the cob technique. They take the mixed earth and straw paste with both hands and stick it directly to the ground in a round plan, thus forming the base of the dome to be built. Then, they compact the dough firmly and level the walls with their hands, thus forming circular, concentric and superimposed layers, slightly cantilevered inwards. Every 60cm of height approximately, the work must stop to allow the drying of the constructed part. This takes about two weeks, sometimes more, after which they resume the work, always in the same way and by steps of around 60cm, until the dome is filled. A glaze around the base of the exterior side and the dome is plastered entirely with a layer of clay soil. The construction is always done without scaffolding or reinforcement.¹⁹⁶

¹⁹² (Aljundi, 1984)

¹⁹³ (*Ibid.*, 1984)

¹⁹⁴ (CORPUS Levant, 2004)

¹⁹⁵ (Mecca, Dipasquale, 2009a)

¹⁹⁶ (Aljundi, 1984)

Earth rendering is used to cover the outer walls; the inner walls are usually covered with limewash. In storage room cupolas, a hole may be carved, to fill the inside with grain; it is then sealed back.¹⁹⁷

> *Lebanese (central-hall) house*

This is a form that is developed lately with its particular features and characteristics, and is sometimes called the *Lebanese house* as it commonly encountered there. This form can be found in both urban and rural zones; it first appeared in coastal cities in Syria and Lebanon during the late Ottoman era and it became a status symbol in rural society. Affluent families in Syrian villages brought and imitated this style from the northern regions of the Ottoman empire, i.e., Turkey and southern Greece. The most important feature of this house, hence its name, is the central hall that is formed by a group of elevated singular arcs that reach the entire depth of the house with rooms of living spaces opening to it. Formal symmetry of its elevations and the sloped gabled roof are significant features of this house. The food stores are kept in an outside space, or within the house if it is a two-story house, while the toilets and the kitchen are located inside. Moving the service facilities to the interior of the house signifies the aims to improve the quality of life of its residents to the socially accepted standard of development of the time.¹⁹⁸

There is also often a balcony which prolongs the room towards the garden or the street.

The Lebanese house generally found in Syria is very modest compared to the houses in Beirut, but it really is the most modern middle-class traditional house in Syria. These houses are found throughout the Mediterranean area of Syria.¹⁹⁹

► **TYPOLOGIES RESULTING FROM TRANSFORMATIONS IN VERNACULAR MODELS**

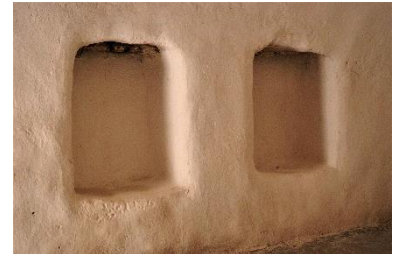
Traditional architecture usually depended on handcrafts, and building materials made from natural components were widely available locally. These materials differed from area to area, thus conferring particular characteristics to the architecture of every area in Syria: this is noticeable in the style, colour and dimensions of buildings, all adapted to local lifestyles and needs. Some of these characteristics have withstood time, others have changed or have been altered to adapt to modern times.²⁰⁰

Both in cities and countryside, uses and shapes of the buildings moved away from the traditional forms. In the countryside, the undergone changes were nevertheless often more limited to materials or techniques.

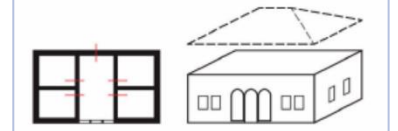
Several construction traditional crafts have been declining and facing near disappearance. This is partially due to the declining number of skilled craftsmen, whom alone knew the building arts and processes, how to prepare materials, determine spans, etc., but also to the shortage of traditional building materials, and to the emergence of “faster” substitute materials. Tourism in areas where traditional types of buildings exist also created a change in the way those building are used.



Wall with earth rendering – © CRAterre



Wall with lime rendering – © CRAterre



Lebanese (central-hall) house – © Al Asali



Electricity network embedded in adobe wall with cement mortar – © CRAterre

¹⁹⁷ (CORPUS Levant, 2004)

¹⁹⁸ (Al Asali, 2016)

¹⁹⁹ (CORPUS Levant, 2004)

²⁰⁰ (*Ibid.*, 2004)

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Cities like Aleppo expanded horizontally to the point that the downtown population, in need of central housing, transformed two storey traditional houses into multi-storey buildings.²⁰¹

Vernacular typologies and constructive models have undergone both formal as functional transformations. Formal transformations include increasing volume – height, width or both – or adding alterations that affect the original shape of the building or its overall appearance, such as openings or layout, or the introduction of modern (and often non-compatible) materials.

↳ In some villages, earth domes have been removed and replaced by concrete flat roofs.²⁰² The thermal and acoustic damages resulting from this change are quite expressive, not to mention the associated risks when considering that the gravity centre of the building has been dramatically shifted upwards – issue of great matter when considering seismic vulnerability, for example.

Replacing mud cupolas by concrete slabs can be the result of a need for vertical extension, as it can simply be just a reflex of a search for a certain notion of “modernity”, with local residents and craftsmen experimenting different ways of building and creating what can be considered as “new styles”.²⁰³

Formal alterations are also carried out in openings – not only windows and doors, but also arches and open and half open spaces such as internal courtyards and balconies – with different reasons, namely new living standards and resulting new ways of grouping rooms. Sometimes, this includes closing internal courtyards, blending partly or fully into inner rooms.²⁰⁴ This completely alters the light and ventilation inside the buildings, as it does its typology and shape.

Functional transformations may include new partitioning to cope with an increasing number of occupants. Rearranging the inner spaces or the functional distribution is also a current strategy for those purposes. In some cases, this goes to the point of constructing a wall inside the *liwan* (the main hall), dividing a vault or splitting a room covered with a cupola. Windows are sometimes fully or partly sealed with blocks, as new openings can be implemented. Even cases of wooden *kishks* replaced with blocks and reinforced concrete have been taking place, with the resulting transformation in typology and appearance, but also in light and ventilation performance of the altered building.²⁰⁵

► GLOBALIZED STYLES TYPOLOGIES

↳ The Socialist orientation of the government since the 1960s has emphasized public housing which is large, multi-storeyed housing blocs with no distinctive features.²⁰⁶

Public buildings are equally plain and built with grey concrete. On the other hand, inside an apartment or a house, the grace and elegance of the Syrian home is



Concrete slabs over adobe load-bearing walls – © CRAterre



City models imported to village - © CRAterre



Vertical recesses in adobe wall for pouring reinforced concrete pillar – © CRAterre



Concrete slabs and cement plasters over adobe load-bearing walls – © CRAterre



Cement town taking over the earthen dome house, Sfeireh – © CRAterre

²⁰¹ (*Ibid.*, 2004)

²⁰² (*Ibid.*, 2004)

²⁰³ (*Ibid.*, 2004)

²⁰⁴ (*Ibid.*, 2004)

²⁰⁵ (*Ibid.*, 2004)

²⁰⁶ (Ismail, 2015)

prominent. Many apartments have two salons; one with typical Syrian inlaid wooden furniture and the other one furnished with so-called European furniture.²⁰⁷

Concrete is also used in the villages with a general similar look. Most newer houses are one-story square form and more like a box. Most of these are left with columns of concrete and reinforced iron set up above the roof for a future plan to build a second storey to the house. However, concrete seems not to be an appropriate building material as it makes the house cold in the winter and hot in the summer, and families need sometimes to sleep on the roof. The newer houses sometimes have a back garden surrounded by a wall and this is used, the same as the courtyards in older village homes, to grow several fruit or nut trees. Village houses generally include one traditional sitting/guest room where usually guests are received and welcomed. The village elite may have two sitting rooms, the Syrian or Arab room and the other is the “European” room which is furnished the same way as the houses in urban areas.²⁰⁸

	Syria	Aleppo	Latakia
Villa (house)	3.2%	1.4%	7.2%
Multi-storeys (apartment)	40.4%	35.6%	73.9%
Dar-Arabi (traditional house)	56.1%	63.0%	13.3%

Housing types in different governorates of NW Syria (including informal areas) – (data source: Central Bureau of Statistics, Syria, 2010)

> Formal low-cost housing

Like the Simple house, it consists of a basic rectangular plan with four walls made with concrete block masonry, that can sometimes be reinforced with steel rods. Roof can be of wood structure and earth covering, or concrete slab. It is one of the most widespread house typologies, due to the availability of the materials and the reduced efforts and time needed to build it, when comparing with other types of construction.

Like the simple house, this typology can also be found in either one-unit or multiple-unit versions. Vertical expansion (adding a second or a third floor) may be the result of family expansion. This is an often repeated, juxtaposed model.

The foundations are usually in concrete, although sometimes (less often) they can be of stone. In some cases, the construction is made with no foundations.

The structure is of reinforced concrete post-beam type, with an infill of concrete blocks masonry with cement mortar and cement plaster.

Concrete (flat) slabs are the main option for the roofing, but CGI is sometimes used. There are some cases of earth terrace roofs.

[4.5] CONSTRUCTION MATERIALS AND TECHNIQUES

► GEOGRAPHICAL DISTRIBUTION

The materials used for the construction of the villages vary from one region to another, but they are always those found in the surrounding environment. From this comes the diversity of the houses. In the western mountainous region, the limestone chains of the Alawites, the Kalamoun, and the plateaus, the villages are generally made of limestone. To the south of the previous region, towards the mountain of Hauran and



Cement-based constructions taking the place of local traditional materials and typologies – © CRAterre

➤ The official housing census in Syria shows that the proportion of housing built with cement (concrete) was 78.1 % in 2006, whereas only 15.5% of housing was built with stone and 6.6% with adobe (earth) and other materials.

(Central Bureau of Statistics- Syria, 2010)

➤ In regions where stone is abundant, rough stone walls were undoubtedly the oldest solution adopted. Elsewhere, earth would soon be used and become the most widely used material in the Near East.

(Bendakir et al. / CRAterre, 2009)

²⁰⁷ (*Ibid.*, 2015)

²⁰⁸ (*Ibid.*, 2015)

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its plains, a volcanic region located in the south and south-west of Syria, the villages are made of stone and lava slabs. In the region of Damascus and Ghouta (the oasis of Damascus), the villages are mixed, made of earth and wood. As for the central and northern steppes, and part of the upper Jazirah, the villages are built entirely on earth.²⁰⁹

► CONSTRUCTION MATERIALS

The building typologies, as well as their shapes and overall appearance, are defined by the building materials available in each area.

> Stone (*hajar*)

Provided by limestones soft when extracted, easy to cut and polish, they harden very quickly by losing their quarry water, and over time cover themselves with an admirable patina of tones, which give the ancient monuments of Aleppo a unique colour.²¹⁰

The types (nature) of stone – such as basalt or limestone – are different from one area to another, and they are the main material used for construction of the walls of many types of buildings in most cities, such as the case of Aleppo, where limestone walls are mostly present. Traditional souks are also usually covered by stone vaults – namely barrel (half-circular) and cross vaults – and stone cupolas can also be found in mosques, churches, baths and great houses. Stone walls are also present in villages where this material abounds.

Ashlar or dressed quarry stones: The type (shape/size) of stone vary according to the type of the wall to be built and its function in the building. Usually, the stones come in large random shapes and are squared in workshop to a rectangular regular shape. Traditionally, there's a stone foundation, on which the stones are laid with a mortar of mud and straw, in a two-stone facing with around 30cm each, and a rubble and soil filling in between, resulting in walls with 70-80 cm thick.²¹¹

Rough stone: Used for the construction of many shapes and sizes of house walls in villages in regions such as around Lattakia. The foundation is made of large uncut rocks, with rubble and earth packed in between. The wall is then laid using mud mortar, in two-stone facing with around 25cm each and a filling with rubble and earth mixed with straw, resulting in walls with 60-70 cm thick that play an important role in thermal insulation.²¹²

Deposits of basalt in the vicinity of Aleppo deliver a blackish rock, which architecture has taken advantage of and which is used to make millstones.²¹³ Dry stone walls also exist in southern areas of Syria, where volcanic basalt rock is widely available.²¹⁴

> Lime

Used for rendering both stone and earth walls, in cities and villages all over the country, lime plasters play both an aesthetical and protective role, and they are usually laid in three layers – *bsmar*, *bitaneh*, and *dahra*. All three layers are prepared by adding clay (soil), sand and water to the lime, but the middle one may also have fibres; the last layer (*dahra*) also differs from the previous two for requiring rather fine sand.²¹⁵



Stone house in Aleppo – © Zahed Tajeddin



Rough stone house, Aleppo gov. © CRAterre



Dry stone wall, Aleppo gov. – © CRAterre



Whitewashed façades – © CRAterre



Lime rendering, Aleppo gov. – © CRAterre



External whitewash, Aleppo gov. © CRAterre



Internal whitewash, Aleppo gov. © CRAterre

²⁰⁹ (Aljundi, 1984)

²¹⁰ (*Ibid.*, 1984)

²¹¹ (CORPUS Levant, 2004)

²¹² (*Ibid.*, 2004)

²¹³ (Sauvaget, 1931)

²¹⁴ (CORPUS Levant, 2004)

²¹⁵ (*Ibid.*, 2004)

The quality and resistance of lime plasters depend much on the way they are prepared and laid, and they have to be renewed periodically.

Lime is also used for whitewashing, particularly on the internal side of the walls, both of stone or earth, since it gives a bright finishing and has a positive impact on the air quality and sanitarian control. It is prepared by soaking lime stones in water for several days until they dissolve, and it is then applied in one single layer as painting. It also prevents wall surface from dusting and avoids moisture caused problems, since it allows the walls to “breathe”.

Lime is also used as the binding element in mortars for laying stone walls or domes.

> Chalk (*hawwara*)

Used for decoration, due to its sustained yellow colour imparted by polishing²¹⁶. Its biggest use though is for whitewash – dipped in water for three days until it emulsifies, sprinkled then on mud walls, sometimes used as a first layer under the lime plaster to strengthen earthen surfaces.²¹⁷

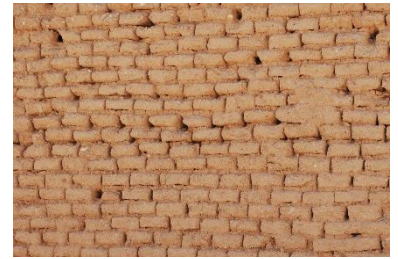
> Earth

Earth is one of the most present construction materials in Syria. In the northwest, it is used for adobes (sun-dried blocks) or cob, but also as mortars both for masonry as for plastering – either for stone or adobe walls or vaults. The soil types may vary a lot from one place to another, and depending on the type of the local available soil, it can be used directly or after adding sand and/or fibres (mainly, wheat or barley straw). Earth plasters may be of one single layer (coarse), for dressing the wall, or of several layers for smoother finishing. Quite vulnerable to water, when used on external walls they may require frequent maintenance and repair, according to the local climate.

↳ Recently, earth and lime plasters tend to be replaced by cement plasters and renderings. This prevents the walls from “breathing” properly and may trigger moisture related pathologies, accelerating the wall’s decay, whether it is of stone or earth (adobe or cob).

Adobe (sun-dried bricks): These are mostly used in the villages and rural houses. The earth is mixed with straw and water, and left maturing for several days. The mix is then poured into moulds, these being immediately removed, and the bricks are left in the sun for three or four weeks, until they are completely dry. The dimensions of the bricks vary according to the region and to their use. Common dimensions are 45-50x25-35x8-15cm for walls, 35x18x7cm for domes, and smaller bricks of 18x9x6cm construction in blocking. The manufacture of bricks is a feminine task, always done in the spring. Earth constructions in their traditional forms require annual maintenance to withstand the harsh climate.²¹⁸

Adobes of around 40x20x10 cm are laid with mud mortar for the construction of **load-bearing walls**. The mud mortar is made from the same earth as the adobes themselves, but previously stripped from any stones or larger gravel. Traditionally, these walls may start directly from the ground if it is rock, and for looser soils there is a stone foundation and a plinth that may rise up to over 50 cm from the ground level.



Adobe bricks and mud mortar – © CRAterre



Adobe bricks sun-drying – © CRAterre



Preparing mud plaster – © CRAterre



Mud plastering – © CRAterre



Mud plasters – © CRAterre



Wood structure (roof) – © CRAterre

²¹⁶ (Aljundi, 1984)

²¹⁷ (Sauvaget, 1931)

²¹⁸ (Aljundi, 1984)

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The thickness of these walls is around 60-70 cm, corresponding to the sum of one length (40 cm) and one width (20 cm) of the adobes, and the joint in between them. They are then covered with a mud or a lime rendering, mainly on the external side.

In cities, smaller adobes of around 17x17x10 cm are used for the infill of the spacing between a wooden load-bearing structure that consists of vertical, horizontal and diagonal bracing elements in wood. The adobes are usually laid in a 45-degree angle with mud mortar, and then covered with a mud or lime rendering. These **wood frame adobe walls** are used for upper floors, laying on the ground floor stone walls.

> Wood

Wooden roofing, and ground and upper floors are widespread in Syrian houses. The most used types of wood are **Poplar** for its widespread availability, and **Cypress** for its quality and durability. Both are commonly used in logs, but in more important spaces or prestigious houses, these can be covered with wooden boards (*al-tabak*) of 120x20x2 cm that can be ornamented with painted decoration.²¹⁹

> Fibres

Goat wool: Used in the woven fabrics for making the nomad's tents.

Straw: Mainly from wheat and barley, straw added to earth (usually from the local) and eventually sand, in the preparation of mud mortars, that are then used to lay either stones or adobes, but are mostly for plasters and renderings of walls.

Cane (reed): Collected from spontaneous local plantations, and used mostly as bottom layer in flat roofs, laid upon the horizontal wood rafters.

Palm leaves: Tressed in mats to lay over the wood joist of the terrace roofs, to receive the earth layer on top of it.

> Industrial materials

Woven polypropylene: Bags (mainly reused) made of this material are sometimes used as a screen under the brush layer of the roofing, to prevent dust or small pieces of brush to fall down from the ceiling. This is a "modern" substitute for the traditional reed or palm leaves mats.

Cement: It is produced in the country (by foreign company), but Syria remains a big importer of cement. In 2020, Syria imported 43.4M USD, becoming the 65th largest importer of cement in the world. In the same year, cement was the 18th most imported product in Syria, primarily coming from Türkiye (42.9M USD).²²⁰



Ceiling sealing screen made with fibres mat – © CRAterre



Ceiling sealing course made with woven polypropylene – © CRAterre



Ceiling without sealing course – © CRAterre



Roof with wooden structure and polypropylene screen course – © CRAterre



Different house types and roofs in the village of Rasm El Boukhar, near lake Assad, Aleppo governorate – © CRAterre

²¹⁹ (CORPUS Levant, 2004)

²²⁰ (Cement in Syria | OEC, [s.d.]

[4.6] ORGANIZATION OF CONSTRUCTION

► AVAILABLE SKILLS

The abundance and variety of materials specific to construction have contributed to favouring the development of stone industries in Aleppo: renowned since the Middle Ages for their professional qualities, the quarrymen and masons of Aleppo are still today the most expert and appreciated in all of Syria.²²¹

The lack of expertise and the shortage in skilled craftsmen has led to an abandonment of traditional construction techniques, materials and practices, in favour of globalized solutions such as the reinforced concrete, thus changing the typologies.²²²

► SELF-CONSTRUCTION, MUTUAL AID, INFORMAL AND FORMAL MARKET

In the village, the peasant (*fellah*) is his own craftsman, doing all tasks related to his living environment. He is a mason, carpenter, joiner, it is up to him to build the home and maintain it each spring. Agricultural equipment is often the work of the peasant, except for iron work, which is often entrusted to itinerant blacksmiths, or to the city.²²³

Traditionally, housing construction was always carried out by the collective work of village people or family relatives, with the materials being collected locally or in nearby places, and some manufactured on site, like adobe. For reasons of costs and availability, wood has been replaced by reinforced concrete; this new material is also seen as easier to use. Today, most of the construction is carried out by formal workers.

► WOMEN IN CONSTRUCTION

The layout and decoration being female tasks are entrusted to the peasant woman, as well as the making of domestic tools such as pottery, basketry, etc.

The making of mud sun-dried bricks is a women task, in which men only intervene at the preparation. This process – called *Gath-elleben* (all the operations concerning the preparation of the mud bricks) – always happens during spring. Women are, in most cases, also responsible for the construction of the cob domes – destined to domestic activities other than living quarters.²²⁴



Maintenance: replastering – © CRAterre



Globalized skills – © CRAterre



Women plastering with mud – © CRAterre



Earth domes village, Aleppo governorate – © CRAterre

²²¹ (Sauvaget, 1941)

²²² (CORPUS Levant, 2004)

²²³ (Aljundi, 1984)

²²⁴ (*Ibid.*, 1984)

[5] Analysis of local building practices

↳ The migration and displacement of people inside (and outside) the territory and the country lead to substantial differences between the current context and the one from origin. This may cancel the relevance of knowledges and skills of the displaced, whose practices are very closely related to the context where they learnt and practised them.



The practices presented below are not exhaustive and represent only a sample of those existing. Some need to be better documented. They are constantly evolving and must be analysed on a localized scale.

[5.1] LIFESPAN, MAINTENANCE AND ADAPTATION

(+) Positive points

Site selection

(+) Settlement and housing location is defined by proximity of water (drinking; agriculture), by the choice of elevated places (drainage), or by the possibility of controlling the access (security; defensive).

Maintenance

(+) Traditional Local Building Practices are completely based on local resources, which provides means for continuous periodic maintenance and adaptation, if resources properly managed.

Adaptation

(+) The close intimacy between the morphologies of both traditional buildings and landscape, provide an organic almost symbiotic relation between both and favour specific implementations of both adaptations and extensions to buildings.

(+) Local Building Cultures and practices are evolutionary and can and should integrate new aspects that enhance the existing ones by updating them and making them more affordable, effective or feasible. The maintenance of tradition should not include an adamant refusal of new materials or strategies, neither should it be replaced by these. Integrating new solutions and responses to new challenges, is one of the most self-defining aspects of LBC, allowing them to evolve and remain valid.

Lifespan

(+) Traditional local materials – stone, earth, lime, wood – are durable and easily maintained, and the constructive elements built with them are easily repaired, when compared to industrial materials (that have to be removed and replaced by new), thus providing great durability and lifespan of buildings.

Durability

(+) Local traditional practices, such as periodic whitewashing or plastering of stone or earth walls or domes ensure greater durability to the elements and thus to the buildings.

(-) Negative points

Site selection

(-) Climatic changes have rendered some settlements and housing more vulnerable to climatic extreme phenomena, such as drought and strong dust winds.

Maintenance

- (-) Local Building Practices include context-specific skills and knowledges; if these are lost or forgotten, the quality and efficacy of maintenance is in risk.

Adaptation

- (-) Modern lifestyle requirements often call for the use of more industrialized materials and constructive systems, including when adapting or extending existing traditional buildings. This may not be compatible with traditional materials and existing constructive solutions.

Lifespan

- (-) Traditional materials and buildings (stone, earth, straw, lime, ...) require smaller but more frequent maintenance and repairs. When this is not ensured, decay is accelerated and has eventually more impact than in conventional buildings (cement-based and other industrial materials)

Durability

- (-) The abandonment of villages and rural lifestyle and migration towards the cities, as well as all the IDP crisis, contribute to an accelerated degradation of the abandoned buildings, having a strong impact on their durability.

[5.2] BIOCLIMATIC COMFORT**(+) Positive points****Location**

- (+) Settlements located near sea (Mediterranean), rivers (Euphrates and others) and lakes (Assad and others) take advantage of the existing cooler breezes that mild the local climate, by being structured in a more open street and “square” form, whilst settlements in other regions are more based on protective (from climate) courtyard structure.
- (+) The clustering of several units (rooms), either in isolated clusters or around a courtyard, reduces the exposure surface of the house, thus reducing its vulnerability to both overheat by direct sunlight, and to heat loss during cold.

Orientation

- (+) Earth dome houses have very little openings and these are usually towards west, which is reported to limit mosquitoes inside and at entrance of the house.²²⁵

Thermal comfort

- (+) Earth thick walls have a very important thermal inertia, which provides an excellent passive thermal regulation mechanism: the walls “absorb” the excessive heat during hot days and release it back during cooler nights.
- (+) Mud plasters’ thermal effusivity (its ability to exchange thermal energy with its surroundings) provides a feeling of thermal comfort inside the house, despite variations of air temperature. This is valid both for hot as for cold seasons.
- (+) Earth walls and plasters are able to absorb and release big quantities of humidity (vapour) without compromising its mechanical behaviour or any other. This is a big contribution for both thermal and hygrometric comfort inside the house.

²²⁵ (*Ibid.*, 1984)

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- (+) Earth roofs (terraces) are a great insulation and hygrothermal regulation passive mechanism of the house.
- (+) Inclusion of fibres in traditional terrace roof – straw mixed with earth at upper layers, as well as the brush layer at the base – is an important contribution for its thermal insulation.
- (+) The fountains traditionally existing in the courtyards contribute for cooling the air, through the energy loss during evaporation. This interacts with hot air in other parts of the house, creating air flow that will cool the air inside.
- (+) Traditional typologies have small and few openings on the external façades. This ensures ventilation and a natural light inside, without direct sunlight, controlling overheat or dust winds from coming inside the house.

Acoustic comfort

- (+) Traditional thick stone or earth walls and roofs are excellent acoustic insulators.
- (+) Mud surfaces, either plastered or whitewashed over mud plaster, are very good sound absorbers, eliminating reverberation inside the house. This is valid for walls, for domed ceilings, and for floors.
- (+) The mass (thickness and density) and the composition (materials and layers) of earth roofs (terraces) provide these with great sound-insulations properties, thus largely contribution for the acoustic comfort of the house.
- (+) The textured inferior surface of the flat roofs – composed of wood joists, reed (or synthetic sackcloth) screen, and brush layer – is an excellent sound absorber, eliminating reverberation inside the house.

Ventilation

- (+) Courtyard house acts as a natural ventilation mechanism, allowing every room to have direct airflow entrance but avoiding direct sunlight, preventing from overheating.
- (+) In hot season, high domes allow hot air to flow up, thus bringing the air cooler at floor level, where people sit and do their activities.
- (+) Dome houses have little openings at low part and upper part of the walls/dome. This favours the entrance of cooler air and the extraction of hot air, by passive thermodynamics, favouring thermal comfort on the inside.
- (+) Earth materials – either adobes, cob, stone-binding mortar, or plaster, have the ability to exchange vapour with its environment, making possible for the building to “breathe”, thus contributing to fresh and healthy indoor air.
- (+) The *kishk* – wood closed balcony-like protruding windows (a sort of wooden *mashrabiyyah*) – allows a good ventilation while protecting from direct sunlight, and also ensuring privacy. When throwing over public space (if located on façades), the *kishk* creates a transversal ventilation system along with openings at courtyard level.

Shade

- (+) The arcades (*riwaq*) or *iwan* create shade, thus lowering the temperature of air mass next to the house. The difference of pressure between that air mass and

the warmer one will create airflow that will cross the house creating a cooling effect.

- (+) The same phenomenon happens with gardens in courtyards, through the evaporation of humidity that they create, but also due to the fact that they create shade, which will generate cooling of the air mass.
- (+) In urban context, some streets are partly covered, protecting walls from direct sunlight.
- (+) Traditional urban houses have elements that help to increase the number of shaded areas, such as the use of protrusions and cornices on the outer façades or on the inner court.
- (+) Traditional houses in urban areas also contain many architectural elements made to ensure a natural airflow through all the spaces; wind catchers as well as openings opposite each other are used. A great variety of ceiling heights are used and the main spaces of the house are conceived so as to be ventilated by soothing winds

(-) Negative points

Orientation

- (-) Urban expansion without planning leads to random choice of housing relation with natural elements such as sunlight and winds, generating lack of comfort or high energy demand to achieve it.

Thermal comfort

- (-) The replacement of traditional wood-earth-straw roofs by concrete slab roofs represents a big reduction in thermal behaviour, namely insulation and hygrothermal comfort.
- (-) New models based on industrial materials often do not respond to climate context, responding in a very poor way to thermal and hygrometric issues.
- (-) Emergency and transitional shelters have very poor hygrothermal behaviour, not providing comfort inside.

Acoustic comfort

- (-) Emergency and transitional shelters' poor acoustic behaviour makes it more complex to match IDP sites' high density with the importance of intimacy in Syrian society.

Ventilation

- (-) Recent transformations in traditional typologies, such as closing courtyards or windows, reduce the airflow inside and through the house, and may jeopardise the thermal comfort inside.
- (-) On the other hand, some globalized style typologies include wide windows without the proper criteria of exposure or orientation, thus creating new problems related to overheat from direct sunlight, heat loss during cold season, or dust entering from winds.
- (-) Lack of maintenance and resulting decay and abandon of traditional *kishks* means reduction or suppression of openings on the external (street) side of the building, thus diminishing or annulling the transversal ventilation effect.

Shade

- (-) Newly introduced typologies often lack shade areas around or in proximity (courtyards, *kishks*, arcades) that would favour ventilation and avoid direct exposure of walls to sunlight.

[5.3] ENVIRONMENTAL ISSUES

(+) Positive points

Construction materials

- (+) Mineral-origin materials (stone, earth) are widely available and are reusable *ad aeternum*. When used in construction, they don't produce any waste, neither in production or construction phases, nor in the whole life cycle of the building: a building made of materials such as earth, stone, straw, wood, goes back to its origin (site's ground) and "decomposes" leaving no trace nor harmful impacts.

Energy consumption and carbon impact

- (+) Traditional housing is totally based on the use of natural local resources, most of them (earth, stone, fibres) without any energy-consuming transformation and not requiring transportation.
- (+) Vegetal-origin materials (wood, fibres) are renewable and represent a negative impact in carbon release (meaning: using wood and fibres imprisons carbon instead of releasing it as transformation of industrial materials does).
- (+) The soil used for earth construction is mineral soil, which is not usable for anything else. Organic soil, suitable for agricultural purposes, cannot be used for construction purposes.
- (+) Local materials remain available during the whole life-cycle of the building, thus all the aforementioned advantages in terms of transformation, transportation, and waste, are extendable to maintenance and end-cycle (demolition, recycling, reuse, ...) phases.
- (+) Solar energy is increasing in Syria, much because of damage or dysfunction of the existing system. In a territory with high rates of sunlight, solar energy can be a good strategy for any settlement or housing implementation project.

(-) Negative points

Construction materials

- (-) Cement-based materials require a huge input of energy and carbon emissions, in transformation and transportation phase. The use of these materials in construction should be according to real needs, in order to limit those impacts.
- (-) Waste management in industrialized construction remains a big yet often partly ignored issue, with all the waste resulting from extraction, transformation, construction, and post-end-cycle phases.

Global warmth

- (-) Construction sector represents 30% to 40% of total consumption of final energy in the world.²²⁶ Industrial materials represent a big part in this, and thus should be used only where necessary, to limit impacts.

²²⁶ (UNEP, 2017)

- (-) Cement industry alone stands for the emission of 5% to 8% of the world total GHG (greenhouse gas) emissions.²²⁷ Limiting the use of cement-based materials to where it is necessary – structural elements or reinforcement – can help reduce these numbers.

[5.4] HAZARD-RESISTANT PRACTICES



Dust storm

(+) Positive points

Courtyard house

- (+) The courtyard is less impacted by dust storms, thus allowing to maintain a certain domestic outdoor activity, including stockage and animal shelter.
- (+) The courtyard works as a filter that reduces the intensity with which the dust storm strikes the openings (if these are towards the courtyard).

Dome house

- (+) Domes' "aerodynamic" shape offers the smallest possible area of impact to winds for a given internal surface.
- (+) Earth dome houses' small and few openings are usually towards west, avoiding prevailing direction of dust winds yet ensuring ventilation.

(-) Negative points

House surroundings

- (-) More vegetation around the houses and settlements would contribute to filter the dust transported by winds and thus lower impacts on human health (respiratory diseases, amongst others).

Erosion

- (-) Strong winds carrying dust (fine particles) are more likely to cause erosion in surfaces such as earth renders. This is most likely to require more regular and careful maintenance.



Floods

(+) Positive points

Typologies-materials-climate

- (+) Traditionally, materials and constructive solutions are very much adapted to local climate, including use of more water-resistant finishing materials or constructive details where it rains more – in these places, external plasters are sometimes lime-based, which makes them more resistant.

Constructive details

- (+) Traditionally, there's often the inclusion of a basement of a few layers of stone at the base of the water-sensible earth walls, keeping these dry and safe.
- (+) Domes allow a quick and effective drainage of rainwater, if properly plastered and maintained.

²²⁷ (*Ibid.*, 2017)

(+) Flat roofs (terrace) are actually not flat but rather have a slope, allowing rainwater to drain effectively. Gutters are also present.

(+) Dome units have a thick plinth at base, made with an extra layer of adobes on the outside, thus becoming more resistant to water presence. This sacrificial mass (the plinth) has to be regularly repaired and partially repaired.

(-) Negative points

Typologies

(-) Traditional typologies may need to be updated regarding current precipitation levels, namely in what concerns including basement and adjusting its height.

Settlements

(-) Collective drainage should be a key issue in any settlement planning or maintenance. IDP sites should integrate drainage as an early phase planning approach.



Drought

(+) Positive points

Typologies

(+) Traditional courtyard house usually has a water well. Besides directly providing water, wells allow easier strategies of collecting rainwater, either from roofs or other forms.

(+) Traditional buildings, due to their thermal behaviour and their hygrometric regulation capacities, ensure better comfort and living standards during drought periods.

(+) Courtyards with gardens create micro-climates, eventually reducing the felt effects of drought at house level.

(-) Negative points

Water harvest

(-) Strategies for harvesting water from roofs were not identified, during the production of this document.

Drinkable water

(-) With drought, levels of microorganisms potentially hazardous to human health increase in available water, bringing down the availability of drinkable water. Many people consume water with no safety standards, both for drinking as for agriculture, which also generates health problems at food level.



Fire

(+) Positive points

Local materials

(+) Traditional local materials, such as stone and specially earth, are non-combustible.

(+) In rural house, cooking usually takes place in the courtyard, minimizing the risk of fire.

(-) Negative points**IDP settlements**

- (-) There is a great risk of fire, given the precarious conditions in which people cook, as well as the inflammable materials some shelters are made of – fabric for tents, chemical products for sandwich panels, materials for makeshift shelters.
- (-) The density of IDP settlements and the amount of people sharing the shelter of various types are an aggravating factor for the dimension, impact and consequences of a fire.

**Earthquake**

The earthquake that stroke Syria on February 6 2023, makes any kind of conclusions hard to extract before proper and thorough assessment, focusing on the forces and weaknesses of every constructive system that has been challenged by the recent earthquake, triggering deep pondering on strategies to enhance or improve the different typologies and constructive systems according to their behaviour and damages observed.

(+) Positive points**Choice of materials**

- (+) The use of mud mortars in masonry – as used in Syrian vernacular construction – is believed to help dissipate the energy of EQ, thus lowering impacts in buildings.
- (+) Domes have a self-locking shape that tends to resist better to any shaking than angle-edge-vertex volumes.
- (+) Mud mortars are more likely to crack during earthquake, thus releasing some adobes or stones one by one, while stronger mortars, such as cement-based ones, bind harder and cause walls to fall down in one piece, which is potentially far more deadly. The same principle can be applied when comparing a traditional roof – with wooden joists and earth layers on top – with a concrete slab.

(-) Negative points**Choice of materials**

- (-) Cement can give a false idea of simplicity, thus making easier misuse or wrong design or execution. Reinforced concrete buildings are a major cause of death in case of earthquakes. Many of these buildings had been misconceived or executed not according to the rules and state of the art, discarding or not being able to ensure major aspects such as the use of skilled labour, proper procedures, and the quality of materials – both cement itself as aggregates. Concrete can have an important role in quality construction but it requires proper skills and knowledge.

[5.5] HEALTH AND HYGIENE ISSUES RELATED TO HOUSING**(+) Positive points****Air**

- (+) The use of lime renderings and whitewash is an important and effective way of sanitizing the interior of the houses, lime being bactericide.

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- (+) Lime's chemical reaction during the curing (hardening) process consists basically of "absorbing CO₂" [Ca(OH)₂+CO₂->CaCO₃+H₂O]. By whitewashing the walls inside the house, this chemical reaction represents a sort of "purification" of the air.
- (+) Natural materials (stone, earth, wood) do not release any volatile compounds or any other hazardous products or vapours, as most industrial materials do.
- (+) In traditional houses, cooking is usually done either in the courtyard or in specific domes for that. This keeps smoke away from living quarters.

Moisture

- (+) Lime plastering or whitewashing allows the walls to breathe, thus not only avoiding its degradation, but also avoiding outbreaks of mould or any bacterial phenomena.

(-) Negative points

Sanitation

- (-) In many IDP settlement, there's a lack of WASH facilities, and many shared toilets.

[5.6] USE AND AESTHETICS

(+) Positive points

Identity aesthetics

- (+) Specially the dome houses have become a symbol of rural Syria and a major factor of interest for tourism and cultural identity, contributing to their existence and maintenance.

Beauty of materials

- (+) The stone used in urban bigger or public buildings is of great beauty and has granted cities like Aleppo a recognition for that.
- (+) Great works of arches and vaults with those stones in urban buildings are also part of the aesthetics that value cultural identity.

(-) Negative points

Imported models

- (-) Globalized models brought from elsewhere have not been properly assimilated and translated into local reality, bringing out buildings and architectural options that are disconnected from any tradition or relation with the context, both aesthetically as functionally.

[5.7] ECONOMIC ASPECTS

(+) Positive points

Choice of materials

- (+) Vernacular materials are available locally, eventually some of them (stones and earth, for example) for free, and usually they don't require any special transformation nor transportation, or any paid operation at all. This potentially represents a big economy in construction.
- (+) Vernacular construction techniques and materials allow self-construction or community-driven implementations, which advantageously allows a drastic reduction of costs.

- (+) Vernacular techniques may require small affordable maintenance interventions regularly operated, but using only local and available materials, avoiding bigger investment in procuring non-local materials.
- (+) Vernacular materials allow small repairs and replacements, while industrial materials generally imply total removal and replacement with new elements. Thus, even in cases when initial investment is bigger for traditional local solutions, it becomes much cheaper with time.
- (+) Most of the materials used in traditional vernacular construction, such as earth, stone and wood, can be reused.
- (+) If properly managed, the use of wood in construction may represent an opportunity in terms of market, and thus thrust replantation strategies under an economical perspective.
- (+) Local Building Cultures rely mostly on what is really needed to provide proper and durable housing and buildings. This means a mindset of economic approach.

Local economy

- (+) Building with local materials and techniques means investing in local economy.
- (+) Moving from transitional to permanent shelter is an opportunity to create job opportunities within IDP settlements, as some projects have tested.
- (+) In many cases, local architecture and heritage (vernacular included) is a major point of interest in tourism-related activities.

(-) Negative points

Choice of materials

- (-) New construction and mass urban implementation, tend to a mindset of “disposable” construction materials and elements, due to the impossibility of reusing those, or to adapt buildings without throwing away everything and buying new. Combining vernacular and industrial materials, with the right choices for each element and seeking good and effective design can mitigate that effect.

Cost

- (-) 2 in 3 renting IDP households report facing difficulties in finding affordable accommodation.²²⁸

[5.8] SOCIO-CULTURAL PRACTICES THAT PROMOTE RESILIENCE

(+) Positive points

Community

- (+) Traditionally, Local Building Cultures are community related, and tend to be expressed through community actions and implementations.
- (+) The use of local materials with local knowledge, under local principles and with local concerns and options, strengthens the identity of the local community.
- (+) The passing of knowledge inherent to the continuity of local traditions, including construction, is a vehicle of intergenerational communication and interaction.

²²⁸ (Shelter Cluster, 2022)

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- (+) A community that can build its habitat with local materials and knowledge is a community that is stronger and with a higher degree of autonomy and resilience.
- (+) Traditional constructive practices promote the inclusion, calling on all groups to participate – elderly, youngsters, female, ...
- (+) Flat terrace earth roofs have a social and economic role, as they are the place for drying crops, stock products, but also to sleep during hot nights.

(-) Negative points

Exclusion

- (-) Industrial materials may require exogenous skills and expertise, which can keep people from taking more part in their own house-making process.
- (-) The loss of local solutions means, with time, the loss of understanding of *how and why* things were done as they were, and thus lower resilience levels for contextual risks and hazards.

[5.9] IMPROVABLE BUILDING PRACTICES AND RECOMMENDATIONS

Environment

- Planning for building should also include planning for planting, as a strategy to mitigate dust storm effects. “Green filters” designed and planned for the entourage of settlement and according to aspects such as wind direction, water level, soil type, etc., could filter the winds, as well as help soil become more permeable to rainwater and thus lower the risk of floods. “Green filters” could also become part of sustainable activities, such as vegetable gardens for inhabitants, especially in urban context and IDP settlements.

Site selection and urban planning

- Basic rules concerning flood areas should be better taken into account, when planning for any type of project.

Knowledge and know-how

- The loss of knowledge and know-how on traditional arts and skills is both a cause and a consequence of shifting to globalized models. Recent EQ damage levels suggest that poor workmanship might be operating in large scale.
- The evolution of the current formal education system discards training in traditional techniques. These techniques are also often not acknowledged and, when put through current formal requirements, may not allow the preparation of project calculations or even their application on construction site.
- Understanding the principles of traditional construction and the reason why it has been implemented that way for centuries is the key starting point to be able to update those principles and achieve “modern” versions of traditional practices and techniques, that may respond to current requirements and demand, but that stay anchored in ancient knowledge proven to be effective and adjusted. Evolution (and not rupture) as inherent element of tradition.
- Climate change and growing extreme weather phenomena, such as rising flood and dust wind storms, require better capacity of planning and design, in order

to make buildings and settlements more resilient and able to face the upcoming growing challenges.

Foundation, basement and walls

- The increasing incidence of floods and the level they reach, suggest a review and eventual update on some existing aspects, such as the height of the stone basement, which should always exist in earth walls.
- Some good existing practices should be valued and continued, such as the stone layer on the top of adobe walls, the existence of plinth at the base, or the “breathing” renderings.
- Proper assessment on the damages caused by the recent EQ will provide data to work and reflect on improved practices.

Roofing

- Earth thick roofs are a good strategy to protect the inside from overheating. If concrete slab is to be applied in roofing, insulation should be added.
- Earth domes remain an excellent solution for certain contexts, at different levels, and should be cherished. Its physical maintenance is not more important than the maintenance of know-how, which is reported to be declining. Promote training could include ponderings on how to update the constructive process.

Openings

- The intelligence of the passive ventilation should be highlighted and fostered: small and few openings towards the “aggressive” external sides, and more generous and protected openings towards the protective internal sides (courtyard).
- *Kishks* (unfortunately in decay, both in use and maintenance) play a very important role in ventilation and thus hygrothermal comfort, and its inclusion in new construction is an added value, both at bioclimatic as at social and cultural levels.

Finishings

- Lime is very compatible with earth supports – walls or domes – allowing the walls to breathe thus contributing to its longevity. Its efficiency depends a lot on the way lime-based materials (plaster, whitewash) are prepared, namely time and mixing procedures.
- Cement plasters have an opposite effect to the one referred for lime, and should only be used to coat cement-based walls, and not for earth or stone-and-mud-mortar walls.
- On the other hand, mud plasters can be laid over many supports, such as concrete blocks masonry walls, for example. Although not an ideal constructive choice, earth renderings on the inside could help bringing the comfort levels closer to desired, due to properties aforementioned such as thermal inertia and effusivity, or hygrometric regulation properties.

[6] Projects based on local building practices

[6.1] MUD VILLAGES (IDP) – QATAR RED CRESCENT / BINAA

A large number of IDPs was forced to live in canvas tents as an emergency response after the conflict. The Qatar Red Crescent Organization, with the help of its partner BINA for Development present in Syria, decided to build 5 mud villages between 2015 and 2017 as a more permanent alternative, with a total of 1,100 mud houses built using conventional mud and cost-effective building technology, derived from a heritage that is thousands of years old.

Materials and design stemmed from the local context, climate and social-cultural. In addition to that, the earthen buildings achieve the purpose of the houses, temporary settlements that can be easily dismantled upon the return of the displaced to their villages, and this is in line with the tendencies of local and international authorities not to establish permanent settlements. The project created 3,500 job opportunities, and some of the beneficiaries participated as workers in the construction process.

Location: Five locations in Harem and Idleb districts, Idleb governorate

Materials and technology: Over 20 tests were conducted, with different materials, different proportions of the components of the mixtures, different types of moulds and manual presses. Different earth construction techniques (adobe, cob and rammed earth) were also tested, adobe having been adopted for the projects, for few reasons: low demand of energy in production; manual process (extraction / transportation / mixing / production); low environmental impact and energy level. Although adobe is quite present traditionally, urbanization has contributed to its decline, and thus CRAterre was called on supporting the process. The elderly persons were also called on sharing their knowledge on earth building with the local workers.

Field and laboratory tests conducted (for each village) on the soil types and mixtures, and on the preliminary production of adobes

Design Principles: Based on the principle of the open area of Syrian rural houses – courtyard, *riwaq* (arcade), or *iwan* – as a socialization central element, small front gardens were planned in order to allow social interactions between neighbours.

IDP families participated in the ponderings about size, functionality and organisational guidelines for the architectural designs.

► (I) PILOT PROJECT IN AFES

Experimental project through which building materials, design method, construction details and options could be tested. It allowed the creation of temporary jobs and training workshops for the population. The success of this project expanded its scope to four other mud villages later to be built.

Location: Village of Afes, sub-district of Saraqeb, Idleb governorate.

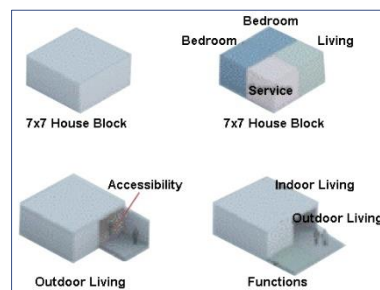
Number of houses: 92 units.

House typology: 36 m² containing 2 bedrooms, 1 living room, 1 kitchen, 1 bathroom.

Project duration: 10 months (July 2015 - January 2016).

► Preliminary steps

1. Construction of an experimental model;
2. Technical support from CRAterre, for evaluation of results and recommendations on the technical approach;
3. ToT (training of trainers), conducted by CRAterre (held in Turkey to allow all partners to attend);
4. Training repeated in Syria for the engineers of BINAA – organization that would later implement the construction of the mud villages.



Design principles – © QRC/BINAA



Afes implementation plan – © QRC/BINAA



Afes – production – © QRC/BINAA

Budget: 238,000 USD; Qatar Red Crescent as donor.

Project Partnership: Qatar Red Crescent; BINAA for development (project manager and contractor); CRAterre (technical consultant); Kudra (third-party monitoring and evaluation).

Techniques and materials

- Foundations: reinforced concrete.

- Walls: adobe (earth and straw); CEB - compressed earth blocks (non-stabilized earth).

- Roofs:

[type1] wooden structure (5x12 cm wooden beams topped with 2.2 cm thick wooden planks); geotextile sheet; slab (7 cm thickness of soil-straw mixture); protective geotextile sheet (laid after drying of the mud-straw layer).

[type2] reinforced concrete slab (9 cm thick) with 3% slope.

► (II) AL-FAROUKIA VILLAGE / BIN SAREE

The project targeted IDPs who live in collective centres – schools and public buildings in particular – aiming to give them more stability and better participation with the host community, by also obtaining schools and public buildings.

Location: Village of Al-Faroukia, district of Salqin, governorate of Idlib

(near the Oronte river, around 1 km from the Syrian-Turkish border)

Number of houses: 200 units.

House typology: 60 m² containing 2 bedrooms, 1 living room, 1 kitchen, 1 bathroom, 1 toilet.

Infrastructure: commercial (20 shops); services (school, bakery, two mosques, craft workshop Market, health centre, administrative centre, cleaning equipment); water, sewage and electricity networks; main and secondary roads.

Project duration: 12.5 months.

Budget: 1,173,567 USD; Mr. Nasser Rashid Saree Al-Kaabi as funder.

Project Partnership: Qatar Red Crescent; BINAA for development (project manager and contractor).

Technique and materials

- Foundations: local stone with cement mortar top levelling.

- Basement: stone up to 1 m high, for greater durability (as latter shown), resulting from preserving the adobe walls from moisture.

- Walls: adobe (earth and straw) laid on the stone basement.

- Plasters: mud (local soil and straw “macerated” for 24h previous to its use) and finishing layer with lime plaster. Cement plasters up to 1 m high in wet areas.

- Floors: 20cm rammed earth (local soil) bottom layer, and top finishing layer with sieved then moistened local soil. Wet areas floors in 8 cm thick ordinary concrete smoothed.



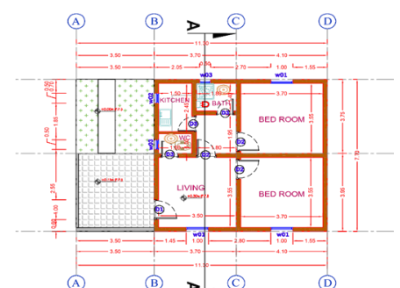
Afes – project houses in construction (top) and finished (bottom) – © QRC/BINAA



Al-Faroukia - general plan – © QRC/BINAA



Al-Faroukia - aerial view – © QRC/BINAA



Al-Faroukia - house unit plan – © QRC/BINAA

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- Roofs: wood structure (beams and planks) covered with two layers: 1. humid mixture of local soil and straw; 2. plastic mixture of local soil, straw and lime. Slope and gutters for efficient drainage of rainwater.

Constructive details (relevant/innovations)

- inclusion of DPC (damp proof course) at the base of the adobe walls;
- metal mesh (wall tie strap) every 3 courses of adobes at intersections and corners; and all around the walls at threshold level;
- insertion of a wall-top sill for beams/joists support and distribution of the loads of the roof through the walls equally (and not punctually).



Al-Faroukia - construction site, base of the adobe walls – © QRC/BINAA



Al-Faroukia - construction site: adobe masonry (left); roofing (middle); plastering (right) – © QRC/BINAA

► (III) A DECENT LIFE VILLAGE / HAREM

Architectural and construction plans were drawn up in accordance with the guidance and the levels of the mountain topography. The works began at the site by executing a main road that represents the artery of the project. Due to the large inclinations of the land, a base was excavated for each unit and sub-roads have been built to secure the access of building materials to all blocks.

Location: near the Town of Harem, Idlib governorate.

(Harem Mountain countryside, around 500m from Syrian-Turkish border)

Number of houses: 484 total units, of which 436 units within the village of Jabal Harem, and 48 housing units within the city of Sarmada of the Orphan Camp.

House typology: [type1]: small residential unit of 24 m² containing 1 bedroom, 1 living room, services; [type2]: large residential unit of 36 m² containing 2 bedrooms, 1 living room, utilities.

Infrastructure: All facilities, including water, sewage, a main reservoir, and 14 shops, along with a network of main and secondary roads.

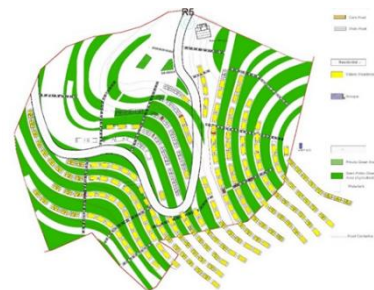
Project duration: Two years (1/2/2016 - 31/12/2017).

Budget: 837,470 USD; Qatar Red Crescent as donor.

Project Partnership: Qatar Red Crescent, BINAA for development (project manager and contractor).

Technique and materials:

- Foundations: local stone with mud mortar.



A decent life - general plan – © QRC/BINAA



A decent life - aerial view – © QRC/BINAA



A decent life - house unit plans – © QRC/BINAA

- Basement: local stone with mud mortar up to 1 m high in most units and 25 cm high in some units. Cement screed levelling on top, then DPC before laying the adobes.
- Walls: adobe (earth and straw)
- Plasters: mud (local soil and straw “macerated” for 24h previous to its use) and finishing layer with lime plaster. Cement plasters up to 1 m high in wet areas.
- Floors: 20cm rammed earth (local soil) bottom layer; middle layer with sieved then moistened local soil; top layer with mixture of stone waste, hay and a little cement
Wet areas floors in 8 cm thick ordinary concrete smoothed.
- Roofs: wood structure (beams and planks) covered with two layers: 1. humid mixture of local soil and straw; 2. plastic mixture of local soil, straw and lime 3. mixture of stone waste, hay and a little cement. Slope and gutters for efficient drainage of rainwater.



A decent life - construction site, foundations and basement – © QRC/BINAA



A decent life - plastering (left); general view of housing type 1 (middle); general view of housing type 2 (right) – © QRC/BINAA

► (IV) BTIA VILLAGE

The site required several bigger scale previous works, such as scraping before foundation, and the implementation of a main road that represents an artery for the project, winding from a starting at a point and returning to the same point.

Location: the countryside of Salqin, near the town of Azmarin, Idlib Governorate.

Number of houses: 200 housing units (grouped in blocks of two or more units each).

House typology: 60 m², containing 2 bedrooms, 1 living room, services.

Infrastructure: commercial (12 shops); services (school, mosque, health centre, administrative centre); water, sewage and electricity networks; main reservoir and pressure reducing tank; main and secondary roads network.

Project duration: 18 months (1/5/2016 - 31/10/2017).

Budget: 1,358,200 USD; Qatar Red Crescent as donor.

Project Partnership: Qatar Red Crescent, BINAA for development (project manager and contractor).

Technique and materials:

- Foundations and basement: local stone with mud mortar.
- Walls: adobe (earth-straw) with mud plaster, then finishing layer with lime plaster.
- Roofs: wood structure (beams and planks) covered with two layers: 1. humid mixture of local soil, sand and straw; 2. plastic mixture of local soil, sand and straw; 3. mixture of stone waste, hay and a little cement. Slope and gutters for efficient drainage.



Btia - general plan – © QRC/BINAA



Btia - general view – © QRC/BINAA



Btia – basement and start of adobe walls masonry – © QRC/BINAA

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[6.2] ATMEH CAMP, HARIM – GLOBAL COMMUNITIES

Atmeh camp was established with the beginning of the Syrian crisis in 2011, where the displaced people from the countryside of Idlib, Aleppo and Hama gathered in Al Dana district which was considered as a safe area because of its location near the Turkish border. At first, the people set up their tents among the olive trees near the border, but with the increase in the number of displaced people, the camps began to expand, and the people began to improve their tents by pouring cement floors and building walls of cement bricks, then, NGOs working in the area began to support the camps with water and infrastructure services for example: establishing water and sewage networks and rehabilitating the camp's roads.

Atmeh camp established by the displaced people from rural Idlib. After that, people from rural Aleppo and Hama began to settle in the camp. Then, as hostilities escalated and spread to other locations in Syria, people from Daraa, Homs, and rural Damascus came and settled in the camp as well. Most of the residents of Atmeh camps are Sunni Arabs with average incomes (workers, farmers, employees, and craftsmen) whose economic conditions worsened after their displacement and the loss of their jobs.

The camp's economy is based on some shops that sell basic items such as food, new and used clothes, craftsmen, and people who raise livestock and poultry. Most of the camp's residents go to the surroundings communities (Atmeh, Qah, Jandairis and Afrin) to work in agriculture and construction works.

<Atmeh camps are located on the road connecting Atmeh and Jandiris, and this road is newly paved, which made the camps easy to access. As for the sub roads inside the camps, their ownership varies between public property (near the Turkish border), and private property that belongs to the original people of Atmeh. Some residents of Atmeh live in free shelters (located in the public property area) and some live in shelters they have rented or bought from the original owners (located within the private property area)

Existing typologies:

- Tents;
- Shelters with walls made of cement blocks and roof covering with plastic or corrugated metal sheets;
- Shelters with walls made of cement blocks and concrete foundations and roof.



General view – © Global Communities



The camp entrance – © Global Communities



Shelters – © Global Communities



Shelter kitchen – © Global Communities



Wood stove – © Global Communities



Courtyard – © Global Communities



General view – © Global Communities



General plan and risk zone along the river – © Global Communities

[6.3] ZOGHARA CAMP, JARABLUS - CARE

Zoghara camp is located near the border with Turkey, about 27 km from Jarabulus city of, where 11,872 displaced people who fled the conflict from different parts of Syria are live and settled in a self-built shelters and tents in late of 2017. Most of the camp's residents are displaced people who came from the central region of Syria, Homs, while others came from different regions of northern Aleppo. They are all Muslims. For their income, some of them opened markets inside the camp, and some work in agricultural lands, as the area was famous for its olive and pistachio trees, while the majority relying on humanitarian aids (multi-cycle cash).

The camp was established on a public land secured by the local authorities, having two types of shelter: tents and self-built. There are access roads available within and to the camp, and no sensitivity with surrounding villages have been reported.

The displaced people were displaced together as groups of relatives and settled next to each other for their safety, as some of them developed their shelters and erected concrete walls with plastic sheet ceilings, while others stayed in their tents due to lack of income resources. The shelter units were adjacent to each other, affecting their privacy as well as sharing communal latrines was a major concern for the IDPs living in the camp. Seeking the support from the NGOs working in the same area, to cover sanitation and water needs in the camp was the constant concern for camp management.

The constructed dignified shelter units are based on the houses in which IDPs used to live in before the crisis. The materials are locally available, and the construction is entirely based on cement materials.

Shelters' average dimensions are 6x5m, with 2 rooms. All shelter units are connected to the water and sewage networks, where safe and sterilized water is pumped through the main water station in the camp, in addition to the wastewater that is driven away from the dwellings to the main septic tank, to avoid the formation of swamps or stagnant that lead to the spread of disease. Electricity is provided through solar panels.

Design was made by CARE and approved by IDPs, then built by qualified contractor, who was full responsible on securing all materials and skilled labours as well as securing the site, where beneficiaries remain in their tents until finalizing the works and start the hand over process. CARE sought through a competitive bidding process to contract with qualified contractors who have experience in more similar work and have access as well as acceptance in the area in which the project will be implemented.



Zoghara Camp, Jarabulus – © CARE

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[6.4] AL-HALWANIYA CAMP IN RURAL JARALABUS

► SELF-BUILT RESIDENTIAL VILLAGE

A residential village built by the residents who refused tents as an option for shelter after they were subjected to displacement from their homes.

Having set tents in an early stage, they decided to evolve to more comfortable and durable shelter, and organized themselves in a mutual-assistance system to build with local materials, techniques and practices.

The choice laid on adobe, given the fact that this would cost less while providing good thermal comfort and protection, both in summer as in winter, as testified by Hajja Zakia Al-Youssef, who has been living in this camp for 6 years. He states that these houses are a real salvation from the crisis associated with living in tents, as they represent a wall on which they lean their backs, better than a tent that the wind may uproot.

Working in a mutual-assistance system, they created an adobe production unit that would provide the sundried blocks for building the shelters for everyone. Stones and soil were hand carried on the shoulders, and the knowledge was present among the elderly in the camp.

The camp's residents come from different places, such as the eastern countryside of Homs, the eastern countryside of Aleppo, the countryside of Hama, Maskanah, Al-Arima and Al-Shuyukh area.



Al-Halwaniya camp in rural Jarabulus – YouTube captions



Al-Halwaniya camp in rural Jarabulus – YouTube caption

► FOR MORE INFORMATION

PEOPLE IN AL-HALWANIYA CAMP TURN THEIR TENTS INTO MUD HOUSES - YOUTUBE
https://www.youtube.com/watch?v=d-MTv4vCX_4

MUD CAMPS – THEY BUILT MUD HOUSES WITH THEIR OWN HANDS - YOUTUBE
<https://www.youtube.com/watch?v=pQ5fdji5UCw>

BUILDING MUD HOUSES IN SYRIA. AN ALTERNATIVE OPTION FOR TENTS - FOCUSALEPPO
<https://focualeppo.com/2022/10/11/>

[6.5] MA'ARRAT MISRIN, IDLIB COUNTRYSIDE

► MUD VILLAGES TO PROVIDE HOMES FOR ORPHAN CARE

Starting from the concern for the vulnerable groups in society, such as children and women, and after many people were displaced to Idlib province and with a high number of widows and orphans, it was decided to replace the ballet tents they were living in with houses. The solution was to build mud houses, as they are low cost, provide energy-saving heating, and are warm in winter and cool in summer. In coordination with the United Nations, the Syrian Civil Society Organizations Union built 150 mud houses. The Community Support and Development Foundation (CSD) executed the project.

The village has roads and a sewage network planned and established after identifying problems with other camps lacking sewage networks, which led to the spread of diseases, particularly Leishmaniosis. A well was dug and is being utilized. Infrastructure was secured before construction began.

The choice of mud houses was due to their low cost, environmentally friendly, earthquake-resistant, and many other advantages in the area. Before starting construction, a committee of ten active organizations in the area was formed, and they toured the camps and chose those who met the requirements, with widows and orphans being the main targets for housing, totaling about one thousand individuals. The organization was planned in blocks with streets and green spaces. There will also be animal facilities to provide employment for the villagers, in addition to attached structures like a mosque, school, health center, and a commercial market, so that the village is self-sufficient. USCSO's hopes are that this becomes a model village in the region.

> **transcription form an interview with USCSO engineer** (to be seen in the link below):

The truth is that this year there was a lot of rain and snow, and the mud village proved its worth and withstood the difficult weather conditions. I compared the condition of the mud village with other camps and found that it withstood weather fluctuations. Its distinguishing feature compared to other projects is its low cost.

We used the materials available to us, as the soil was available, and the labor force in the region did not use technology. We used simple equipment from the Arab region's culture, and 150 workers worked on this project. Also, the wood was from the area, and its cost was low. We did not import it, and we did not incur the cost of transportation. This is an advantage for us because we achieved all the required specifications for housing at a low cost. The workers who work on the project are those who are familiar with the technique of building with soil, as you can see there are female workers on the construction site. The reason is that the houses will need maintenance in the future, and they will have experience in maintenance since they are the ones who completed the work. Those who knew about building with soil technology benefited us with their experience, and those who did not know learned with us. Ultimately, they will be the ones to perform maintenance operations.

The tent needs to be changed every year, while mud houses are hundreds of years old and only need maintenance every year or two. A mud house fulfills all the requirements



Ma'arrat Misrin – YouTube captions

► USCSO – Union of Syrian Civil Society Organizations

The USCSO is the first coalition between Syrian civil society organisations in the modern history of Syria. It is concerned with lands and citizens' issues and accepts for membership any Syrian civil society organisation, inside or outside Syria. The USCSO is an independent, non-governmental, non-political union. It has 79 member organisations. Its areas of specialisation are relief, health, and education.

(peaceinsight.org, 2010)

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for a good and healthy life, and its cost is limited to the building stage. We will not need additional costs in the future, and it will be sustainable. In contrast, the tent is exposed to burning, rain, and in the summer, intense heat, while in the winter, it is freezing, and it needs to be changed every year. All of this we surpassed with the mud house. We advise anyone working in housing to build with mud.

The apartment consists of two rooms and services and is 24 square meters. Its cost does not exceed 900 dollars to be ready for housing. The tent costs approximately the same price but needs to be changed every year, while the mud house is permanent and stable. It is the least expensive form of housing.

▶ FOR MORE INFORMATION

AL JAZEERA MUBASHER - YOUTUBE

https://www.youtube.com/watch?v=st_R_wkXh44

STEP NEWS AGENCY - YOUTUBE

<https://www.youtube.com/watch?v=h1xqdH17UfQ>

[6.6] OTHER ISOLATED CASES USING LOCAL BUILDING PRACTICES

▶ ALAKHILAS CAMP, NORTH IDLIB

A woman builds earth domes as shelter after a camp flood.

published by: SY Plus / YouTube, Feb. 2021

<https://www.youtube.com/watch?v=5YP1TnwF1e0>

▶ IDLIB COUNTRYSIDE

A woman builds an earth house for the family, seeking thermal protection.

published by: Enab Baladi / YouTube, Oct. 2020

<https://www.youtube.com/watch?v=oltU7lvCwhM>

▶ KAHR DARIYAN

A family uses their ancient knowledge to build with earth, for having more space than provided by the tent where they are living,

published by: Enab Baladi / YouTube, Oct. 2020

<https://www.youtube.com/watch?v=Ngvoz-YfS3Y>

[7] Conclusions: key points

► APPROACH

- A new participatory approach for Dignified and Safer Living Conditions is needed, one that adapts to the more complex, inter-sectoral challenges of protracted displacement, ensures that affected communities are central to planning, while remaining within the parameters of humanitarian action.

Dignified Shelter & Living Conditions are more robust approaches to shelter and site improvement, aiming to upgrade unplanned self-settled IDP sites and promote inter-sectoral programming: Shelter, WASH, Early Recovery, Protection, and CCCM (Camp Coordination and Camp Management) in particular.

- Planning for a settlement or housing project (either new construction or rehabilitation) should include an early assessment, identifying existing strengths and weaknesses, opportunities and threats. A participatory phase should conclude on aspects such as:
 - what is really valuable and should absolutely be kept;
 - what is very useful but has become difficult to apply – which implies studying the reasons for it;
 - what needs to be adapted to better meet today's requirements;
 - what has been modified from traditional models with negative impacts at different levels;
 - what is no longer relevant or has become negative in the current context and must absolutely be "replaced".
- Humanitarian sector should promote approaches that foster the use of self-help or mutual-aid systems, either existing or to be implemented. These not only contribute at the construction phase, but they have an important impact on the build-up of social bonds inside the communities and thus promoting long-term capacities and resilience

► SITE SELECTION

- The choice of location for IDP sites should go through a careful preliminary analysis of the topography of site and surroundings, as well as of the associated climatic factors. This allows for planning with risk mitigation strategies, namely for flood, at the same time as it would try to make the best of the site's strengths, such as presence of water (drinking, agriculture), vegetation (hygrothermal control, wind filters), existing access, etc.

► SITE PLANNING

- Critical levels of overcrowding are a crucial issue in NW Syria IDP sites, thrusting problems at different levels, such as lack of privacy, increased gender-based violence risk, and fire hazard.
- IDP sites are sometimes located nearby existing villages or towns. Planning should bear in mind the creation of "bridges" between the existing and the new communities, aiming for sain coexistence and for possibilities of individual development of arriving IDPs. Strategies such as the location of services and public buildings (market, school, leisure spaces, etc.) on the fringe of the IDP sites may contribute to create that social hinge.
- Site planning should consider all basic aspects of housing settlements, rather than a simple juxtaposition of houses. Planning for "sain" and liveable settlements should integrate different aspects as fundamental as houses:
 - access to water, both for domestic needs and for agriculture (vegetable gardens or green spaces);
 - sanitation, including WASH facilities in adequate number and adapted persons with disabilities, proper sewage infrastructure and treatment, and waste management strategies;

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- health and education facilities;
- green and leisure spaces;
- livelihood opportunities for income generating activities.

→ Besides site selection, site planning should also integrate risk reduction measures from an early stage of preliminary concept:

- floods: terrain modulation favouring natural and quick drainage (slopes and swales) and the creation of well-placed gutters and sumps;
- fire: lower density; safe access to electricity; less fire-prone cooking facilities (built with non-combustible materials, separated from the other rooms of the house, ventilated);
- dust storms: plantation of vegetation around the settlements, that can work as filters for the strong winds and for the dust they transport; shelter orientation taking into account wind direction; shelter design taking into account erosion and the risk of uprooting.

► HOUSING CLUSTERS

→ Syrian lifestyle, either in urban or rural context, is deeply connected to outside living. The courtyard offers an excellent response to different issues: it is a place for different domestic tasks, it ensures privacy in an outdoor space, and it is a bioclimatic “mechanism” that provides hygrothermal comfort to the house. The organization of the house around courtyard is a support itself for the social-cultural Syrian lifestyle, and a major asset in housing design.

→ The courtyard can also be seen as a risk mitigation device: it allows for cooking outside, thus reducing fire hazard and keeping air clean inside the house; it contributes to protecting the house interior from dust storms; it allows some control over floods, by keeping water from entering the courtyard (when there is a wall) and allowing to dig sumps inside; it helps in drought periods, by providing access to water (when water wells are present) and air regulation when there’s vegetation.

→ Floods are often the result of a combine factor of drought followed by heavy rain. The fact that the soil has dried to its limits creates a sort of “crust” on the soil that will not allow rain to infiltrate. Site planning should consider the idea of rain harvesting – collecting rainwater from roofs. An important percentage of the surface of a settlement is occupied by houses, thus by roofs. Rain harvesting would not only keep all the rainwater that falls on the roofs from joining the water on the ground, thus reducing flood hazard, as it would allow to stock big amount of water, thus helping to cope with drought periods.

► SHELTER DESIGN

→ A great number of shelters are overcrowded and/or shared. This has consequences at privacy, sanitary and functional levels. Planning for well-dimensioned shelter should include the idea of evolutionary construction, allowing the building (or the occupation of a plot with several buildings) to expand according to the household expansion – which becomes more important when IDP situation is protracted.

→ IDPs living in the same settlement are not necessarily all coming from same geographical or cultural origin. Shelter requirements may thus be different from one household to another. Shelter design cannot aspire to be individualized. But it can take into account the adaptability factor, so that each household can get identified with the physical space they inhabit, and so that they can more easily adapt it according to their requirements and habits. To this end, participatory design strategies, “incomplete” design (with phases to be completed by the occupant and to his liking) and evolutionary architecture (possibility of extending the building or occupying the plot) can be adopted.

► MATERIALS AND TECHNIQUES

- Local Building Cultures are the result of a continuous experience which includes the use of certain techniques and materials, evolving from deep rooted knowledge and skills that have proven to be valid, within a logic of improvement, adaptation and enhancement of the existing, and integrating new potential solutions. By having reached our days, buildings that have withstood the passage of time have proven to be the best fit for a certain context – climate, use, needs, risks, representation. These context criteria are themselves permanently changing – climate changes, different use, evolving needs, changing symbols. Housing based on this evolutionary approach (and not under a logic of cutting with the past and re-starting from superficial insights of imported models and global unspecific approaches) will necessarily be more resilient and capable of responding to the contextual criteria of comfort and functionality of a community and its individuals.
- IDPs and local communities including some humanitarian organizations have already started to develop shelter units using local materials that are available in the markets with cheaper cost if compared to imported materials and shelter (NWS-XB Shelter Cluster). Results and lessons-learnt from these experiences should inspire other projects and implementations.
- Traditional arts & crafts include skills that can be channelled to housing and shelter design. An example (amongst others) of that would be the use of woven fabric – traditionally used for nomadic tents – for covering shaded outdoors courtyards or terraces. This would have an impact at several levels: highlight of a cultural traditional skill; mechanism for sun protection and thermal comfort control; opportunity for income activities (for women that produce these fabrics); cultural anchor of shelters; “green” approach by using local and natural materials; community owner-driven maintenance of the shelter.
- Earth and stone construction techniques use what exists locally, and therefore represent a major asset for local communities to manage their housing, from design to construction to maintenance, by allowing virtually-free material gathering and none or little costs in transportation (especially in rural areas) and maintenance – local materials may require a yearly-based maintenance but with little or no costs, while industrial materials may require less frequent interventions but demand procuring external materials.
- Vernacular materials and techniques, such as the use (production and construction) of adobe, stone masonry, and mud or lime rendering, are locally mastered in most places of NW Syria. They are affordable and promote comfortable conditions in houses. These techniques have other advantages such as their cultural adaptation and the facility of construction and maintenance for households.
- Survey and analysis assessment of the damage caused by the recent earthquake, will define a basis for weighting strategies to improve existing (both new and vernacular) building practices, including the possibility and pertinence of integrating new materials and construction elements into traditional constructive systems.
- Earth constructions are vulnerable to water. Therefore, a regular maintenance of the exposed areas and protection mechanisms (namely plasters) is required. This procedure rarely requires any costs other than time and effort.
- Another protection against water is the inclusion of a basement or plinth, elevating the base of the earth walls above the rising level of floods – with the eventual need for update and adaptation of those levels due to climate change. Furthermore, a DPC (damp proof course) can be added, consisting on simply laying a plastic film between the top of the basement and the first layer of adobes. This avoids water or moisture to rise by capillarity and soak the adobes – which would cause a drastic reduction in the mechanical resistance of the adobe wall.
- Despite the thermal discomfort, especially during the day, corrugated iron (CGI) is a material with some advantages, such as being light and therefore requiring no more than a light frame. It can also be easily transported and eventually reused. To improve comfort under this type of roof (used in some IDP shelter types) though, it would be advisable to provide ventilation systems, as well as false ceilings. Reed layers, such as used in Syrian traditional flat roofs, could eventually be adapted for this purpose.

► “GREEN” SUSTAINABLE DESIGN

- Climatic changes are a worldwide major concern. They should amongst the preliminary criteria for housing and shelter design, at every level, including IDP shelter and settlements. “Green” design consists on the intersection of the multiple choices for morphology (shape, size, orientation, adaptation, evolutionary, ...), materials (natural, local, recyclable, reusable, renewable, embedded energy, carbon emission, ...) and strategies (functionality, energy consumption, passive systems, bioclimatic, ...).
- Shelters usually have a low specific surface (relation between the volume of the house and its external surface – with big impact on energy transmission, thus thermal behaviour).
- Housing planning should integrate trees and vegetation plantation not just as an added value, but as a core element of a site’s organic functionality. Plantation of trees has impacts at all sustainable development axis: environmentally, it acts as a micro-climate regulator; at sociocultural level, it provides shade areas that favours conviviality and different community activities; economically, it can become a source of material (wood) for construction, as well as for several other purposes.
- The use of local materials, with low requirements in some of the life-cycle stages (transport and transformation), ensures a low impact in both energy and carbon balance. Local traditional materials such as earth and stone are available and environment-friendly, and they require few or none external inputs.
- Bioclimatic design allows a house and a settlement to be more efficient and comfortable with less operating costs and environmental and social impacts. Some relevant bioclimatic strategies (some already existing in LBC) for shelter design for NW Syria are:
 - Making the best use of thermal inertia and effusivity of materials such as stone and especially earth;
 - Using the capacity of earth to regulate humidity (hygrometric control) in the living space;
 - Designing small windows towards the exterior and openings towards shaded internal open spaces (courtyards, *iwan*, *riwaq*), to avoid overheating and direct sunlight inside the house (and dust winds), yet ensuring proper transversal ventilation for coolness and fresh sain air;
 - Using shaded areas to create fresh air mass that enters the house as hot air escapes through high exits (hot air goes up). This can be done by arcades, *kishk*, gardens in courtyards, etc.;
 - Using direct sunlight for heating in winter. Sun height is quite variable from summer to winter, thus designing for direct sunlight during winter (when the sun is lower) and sun protection during summer (when the summer is higher) is possible;
 - Using lime-based finishing (plasters and especially whitewashing), which reflect sunlight, thus contributing largely and in a passive (energy-free) way for keeping the buildings from overheating;
 - Eventually considering the introduction of small greenhouses for heating in winter. Solar radiation captured by a greenhouse can be accumulated as heat by walls with good inertia (such as earth walls) and later released to the inside of the house during the night. Similar strategies can be outlined through including larger well-oriented openings to allow more sun radiation to enter the house and be stocked in thermal mass elements (walls, floor).
- The coexistence of vernacular materials with new ones, and the interaction between vernacular constructive systems and industrialized elements, namely cement-based ones, can be a strategy for improvement of construction and buildings at different levels: mechanical resistance, feasibility, social appreciation, etc. However, cement is a huge contributor for global warming, given its huge energy consumption and GHG and carbon emissions, and it also generates built environments that tend to overheat. Therefore, the use of cement-based materials and elements should be restricted to where it is really necessary and represents a technical or mechanical enhancement of constructive elements, such as foundations, lintels, reinforcements elements, etc.

- Globalized typologies housing can be improved with adopting bioclimatic and passive strategies, such as:
 - Designing for proper ventilation ensuring protection from overheating by direct sunlight, or by openings that are oversized or misoriented (towards west, where sun is lower at hottest hours; or towards south without proper shading elements that protect the openings during hottest periods of the year, when sun is higher);
 - Adopting mud plasters on internal walls, for hygrothermal regulation and better acoustic behaviour (reverberation);
 - Constructing (or properly maintaining) traditional elements such as *kishk* for ventilation and shaded areas on external façades, ensuring privacy and enhancing cultural added value to the house;
- Earth dome houses are a great response to context: they represent a way of building without wood; with a shape that withstands sun and wind exposure in the best possible aerodynamical mode; they allow a very good hygrothermal regulation inside due to their height and the material (earth) they are made of; the constructive technique is mastered by local community; it stands for a major cultural interest, representing an economical potential.
- Shelter design based on local materials could rely almost entirely on local labour, thus creating jobs and generating income amongst disadvantaged communities. Furthermore, they could trigger different actions on training and skills and knowledge building and enhancement in different communities, thus contributing to specialisation and job opportunities.
- Training and skills-building has huge potential for establishing a construction sector able to respond to the challenge of building sustainable housing with “green” materials, and ensure its maintenance, thus increasing durability, comfort and access to dignified housing and shelter, both on short and long term.

[8] Additional resources and bibliography

► KEY CONCEPTS



Adaptive Capacity: The ability of systems, institutions, humans and other organisms to adjust to potential damage, take advantage of opportunities, or respond to consequences²²⁹.

Disaster: Severe alterations in the normal functioning of a community or a society due to hazardous physical events interacting with vulnerable social conditions, leading to widespread adverse human, material, economic or environmental effects that require an emergency response(s) to satisfy critical human needs and possibly external support for recovery²²⁹.

Exposure: The presence of people, livelihoods, species or ecosystems, environmental functions, services, resources, infrastructure, or economic, social, or cultural assets in places and settings that could be adversely affected²²⁹.

Globalised habitat: Housing is influenced by “global trends” promoted in the media, but also by industrial companies and the formal education system. Cement, steel and CI Sheets are gradually replacing traditional materials, but such changes don’t always result in real improvements. Difficulties in affording respect for norms and standards lead to compromising space quality, thermal comfort and even structural safety.

Hazard: The potential occurrence of a natural or human-induced physical event or trend or physical impact that may cause loss of life, injury, or other health impacts, damage and loss to property, infrastructure, livelihoods, service provision, ecosystems and environmental resources²²⁹.

Local building cultures: A building culture is the intangible dimension of what is produced by humans to live, work, thrive, etc. It includes assets related to each phase of the building life cycle: design, construction, use(s), maintenance, replacement, extension, adaptation, etc., that are linked to social, economic, environmental and cultural aspects. The genesis and evolution of building cultures are closely linked to their environment and the specific history of each territory. This is why they are so diverse worldwide and why several building cultures can co-exist within a single territory.

Precarious habitat: This covers different realities depending on the factors that generate it: economic difficulties, climate change, disasters or armed conflicts. It characterises houses or shelters built by low-income families or those who, without a land property title, prefer to limit their investment by choosing light structures that are easy to dismantle or repair.

Resilience: The capacity of social, economic and environmental systems to cope with a hazardous event or trend or disturbance, responding or reorganizing in ways that maintain their essential function, identity and structure while also maintaining the capacity for adaptation, learning and transformation²²⁹.

Risk: The potential for consequences where something of value is at stake and the outcome is uncertain. Risk is often used to refer to the potential for adverse consequences on lives, livelihoods, health, ecosystems and species, economic, social and cultural assets, services (including environmental services) and infrastructure.

Vernacular habitat: It is characterised by using local resources to respond to people's needs, way of life and local climate. It results from reproductions, improvements and ongoing adjustments or adaptations over time and often includes external inputs and imported solutions, though rather parsimoniously. Such constructions often rely on strong links between the inhabitants, their families and neighbours, and their persistence facilitates housing accessibility, pride and feelings of belonging within the community.

Vulnerability: The propensity or predisposition to be adversely affected. Vulnerability encompasses a variety of concepts and elements, including sensitivity or susceptibility to harm and lack of capacity to cope and adapt²²⁹.

²²⁹ (IPCC, 2014), AR5 Synthesis Report: Climate Change 2014

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↳ For more information

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SELF-ASSESSMENT SUSTAINABILITY TOOL FOCUSED ON SHELTER AND SETTLEMENT RECONSTRUCTION IN THE AFTERMATH OF NATURAL DISASTERS: QSAND TOOL
<http://www.qsand.org/>

SUSTAINABLE HOUSING DESIGN TOOL TO ASSIST HOUSING PRACTITIONERS IN DESIGNING SUSTAINABLE HOUSING PROJECTS: SHERPA TOOL
<https://unhabitat.org/shepa/>

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