

IDP Shelter & Settlements Environmental Impact Report

Environmental Assessment and Recommendations for Shelter & Settlement Interventions for Internally Displaced Persons in the Lac Province of Chad





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KAFIA IDP Site, LAC PROVINCE | © 2022 UNHCR- E.Zorawska



CONTENTS

	Acronyms	4
	Executive Summary	5
•	Overview	6
	Methodology	6
	Sampling	6
	Surveyed Sites	7
	Observations	8
	→ SHELTER	8
	Typologies	8
	Emergency Shelters	9
	Building Materials	10
	Construction Practices	12
	Conditions	13
	→ WASTE MANAGEMENT	14
	Sanitation Waste	14
	Household Waste	15
	Gauging awareness & Reuse	16
	→ COOKING ENERGY	17
>	Impact Assessment	18
	Key Findings	19
	Analysis	20
	Recommendations	21
•	Annex	25
	Kobo Questionnaire & Shelter Cluster Chad Dashboard	25
	Additional photos	26

ACRONYMS

ACTED Agency for Technical Cooperation and Development

CNARR National Commission for Hosting and Integration of Refugees and Returnees (Commission Nationale d'Accueil de Réinsertion des Réfugiés et des Rapatriées in French)

CRL Luxembourg Red Cross (*Croix Rouge Luxembourgeoise* in French)

CRT Chad Red Cross (*Croix Rouge du Tchad* in French)

ECOSAN Ecological Sanitation

ICS Improved Cookstove

IDP Internally Displaced Persons

IOM International Organization for Migration

NFI Non-food Items

OD Open Defecation

PoC Persons of Concern

GBV Gender-based violence

UNHCR United Nations High Commissioner for Refugees

EXECUTIVE SUMMARY

Background

The Lac Province of Chad in Central Africa shares its borders with Niger, Nigeria, and Cameroon. Since 2014, the Lac Province has been consistently subject to insecurity onset by violent attacks and military operations. In 2020, the security situation escalated further, provoking a surge of new population movements. As of October 2021, IOM estimates that over 457,000 persons of concern (PoC) are currently in the Lac Province, of which roughly 400,000 are internally displaced persons (IDPs)1.

Context

The hostile climate, extreme level of poverty and lack of infrastructure throughout the Lac Province, renders most host communities incapable of providing basic assistance to IDP arrivals. This turbulent socio-economic context leaves IDPs particularly vulnerable to intercommunity clashes over natural resources and almost entirely dependent on humanitarian actors for basic shelter, food, and water.

Shelter Cluster partners have been able to provide over 5,000 shelters to IDPs in the province in 2021, however a gap of more than 90% in basic shelter assistance needed persists. Furthermore, most shelters built require reconstruction after 6 months or less of use due to the harsh environmental factors of the Sahel region.

Assessment

With the financial support of the Global Shelter Cluster, an assessment was conducted in late December 2021 to measure the environmental impact of the overall shelter response and identify key environmental threats resulting from the construction of shelters and IDP settlements.

Key findings

The scale of demand for trees and vegetation for shelter construction and cooking energy has accelerated desertification and depletion of natural resources in the Lac Province, which compounds existing security risks and inter-community tensions. The lack of household and sanitation waste management in IDP settlements, poses the additional threat of contamination and degradation of groundwater and natural habitats.

Key recommendations:

- 1. Mitigate the overuse of wood in construction through improved construction and training methods.
- 2. Plan & Document IDP Settlements to align humanitarian interventions with regional development plans and projects through the Humanitarian-Development Nexus working group.
- 3. Integrate Green Cooking Energy solutions.
- 4. Build waste management awareness, capacities and mobilize changes.

¹ International Organization for Migration (IOM), October 2021, Displacement Tracking Matrix (DTM)



OVERVIEW

Methodology

Data was collected by surveyors in the field using a questionnaire. The questionnaire was prepared using the Kobo tool, allowing surveyors to easily register data provided by IDP households using smartphones.

The questionnaire covered the following three scopes in the assessment:

- 1. Shelter construction and materials
- 2. Household and sanitation waste generated by IDP settlements
- 3. Cooking energy



Sampling

The survey targeted beneficiaries of shelter kits distributed and constructed by Shelter Cluster partners, as well as IDP households living in makeshift shelters, built independently.

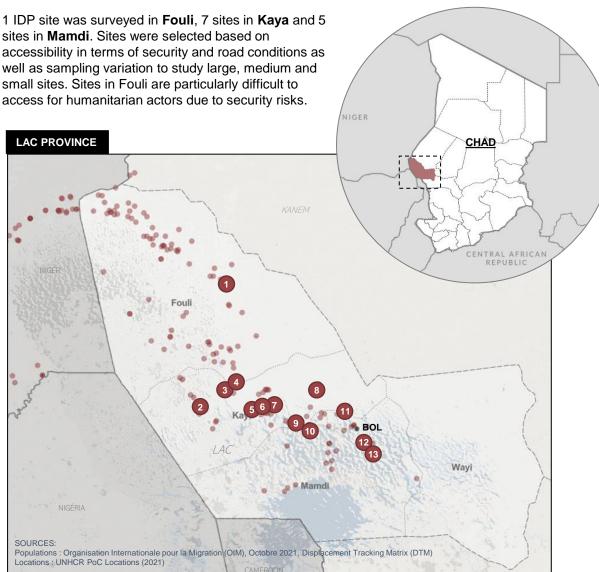
Both male and female surveyors were engaged in the data collection activity, to help dispel potential gender limited reservations around human and household waste questions.

Stratified sampling was applied to all 13 sites visited and 2625 households were selected at random.





Out of 200+ IDP sites in three sub provincial departments, 13 sites were surveyed.



- **1** Amma 1 (pop. 22,709)
- Fourkolom (pop. 30,200)
- **Doum-Doum** (pop. 4,982)
- **Mal Mari** (pop. 1,257)
- **Solution Kousserie 2** (pop. 25,599)
- 6 Kousserie 1 (pop. 14,000)
- **Kafia** (pop. 9,844)
- 8 Ngourtou Koumboua (pop. 9,375)

- Melea Djourou (pop. 1,550)
- **Malindoua** (pop. 4,166)
- **Mokolom** (pop. 5,206)
- **12** Koudoukole (pop. 11,005)
- **13 Ngororom** (pop. 4,154)

OBSERVATIONS

Shelter Typologies

Transitional shelter, KAFIA IDP SITE | © 2022 UNHCR- E. Zorawska

There are four shelter types currently in use in IDP Settlements. The two most common are emergency shelters (52%), provided by the Shelter Cluster and informal makeshift shelters (45%), built by IDPs themselves. Semi-durable and durable constructions remain very rare, accounting for less than 3% respectively of shelters built. The Shelter Cluster accounts for 92% of all emergency shelters constructed in the province, implemented by cluster partners such as ACTED, Care, Help Tchad, IOM, Luxembourg Red Cross (CRL) and UNHCR through its implementing partner Chadian Red Cross (CRT).

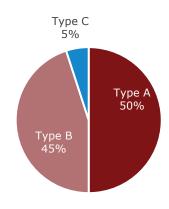
With regards to cost efficiency and durability, it should be noted that although costs related to semi-durable and durable shelters are higher than emergency shelters, the long-term costs are significantly smaller. For example, the durable model, although initially the most expensive option at 1,565 USD per unit, is equivalent to 26 USD per each month of use, versus the emergency model which in contrast is equivalent 73 USD per each month of use.



Emergency Shelter Types

With regards to the emergency shelters provided by Shelter Cluster partners, there are three subcategories based on cladding/siding materials used.

As of July 2021, the Shelter Cluster officially selected the Type A shelter as the recommended option for emergency shelters, based on durability, cost and overall environmental impact. The Shelter Cluster also advised against the use of Type C as the use of tarpaulins has proven to be the least durable, the least adapted to the climate and the most more vulnerable to supply risks.





TYPE A

Classified as a transitional emergency model, uses metal sheeting for roofing and straw siding and accounts for 50% of emergency shelters.



TYPE B

Uses tarpaulins for roofing and straw siding and accounts for 45% of emergency shelters built.



TYPE C

Uses tarpaulins for both siding and roofing and accounts for 5% of emergency shelters built.

Building Materials

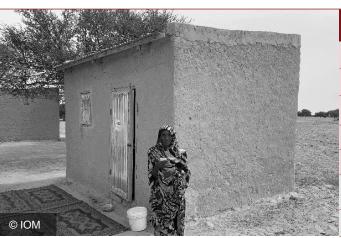
Construction materials are sourced either locally (Baga Sola and Bol towns and local markets) or are imported from the capital city N'Djamena. Makeshift shelters typically use vegetation found near settlements and used fabrics and/or tarpaulins.



Durable Shelter			
STRUCTURE	Cinderblocks		
ROOF	Corrugated metal sheet, wooden frame, cinderblocks		
DOOR	Corrugated metal sheet, wooden frame		
CLADDING	Plastered concrete cinderblocks		
JOINERY	Nails.		

PROS: Durable (60 > months), good protection from elements & security risks.

<u>CONS</u>: Requires detailed site analysis for long term planning and integration with local development plans.



STRUCTURE Banco Bricks (clay and sand based) Corrugated metal sheet, wooden frame

ROOF
Corrugated metal sheet, wooden frame
Corrugated metal sheet, wooden frame
CLADDING
Banco Bricks (clay and sand based)
JOINERY
Nails

<u>PROS</u>: Durable (36-60 months), satisfactory protection from heat, sand & security risks, low carbon footprint.

CONS: Poor resistance to moisture, requires long term planning and integration with local development plans.



Transitional Shelter

Semi-durable Shelter

STRUCTURE	Wood (Beams and Rafters)	
ROOF	Corrugated metal sheet, wooden frame	
DOOR	Corrugated metal sheet, wooden frame	
CLADDING	Palm stems and leaves, straw, woven matts (palm leaves) or tarpaulins	
JOINERY	Rope, nails	

<u>PROS</u>: Fast construction (<5 days), renewable materials, improved security and protection from rain & sun.

CONS: Cladding requires regular maintenance, insufficient protection from strong winds & heat.

Building Materials [Continued]

Other than tarpaulins, fabric and corrugated metal, construction materials are being sourced locally from the natural environment. In principle, this is desirable, however, in practice, the supply significantly outweighs the resources available. The number of shelters needed in comparison to the density of vegetation in the region poses a high risk of environmental degradation and accelerated desertification. In and around the majority of IDP settlements, severe degradation of trees and plants is already occurring.



Emergency Shelter			
STRUCTURE	Wood (Beams and Rafters)		
ROOF	Tarpaulin, palm leaves, wooden frame		
DOOR	Tarpaulin, straw mat, metal sheeting		
CLADDING	Palm stems and leaves, straw, woven matts (palm leaves) or tarpaulins.		
JOINERY	Rope, nails		

<u>PROS</u>: Fast construction (<5 days), low carbon footprint, improved security and protection from rain & sun. <u>CONS</u>: Requires regular maintenance, insufficient protection from strong winds & heat.



Traditional Shelter ¹

STRUCTURE	Tree branches & trunks
ROOF	Straw, palm leaves, tree branches
DOOR	Straw
CLADDING	Straw
JOINERY	Rope

<u>PROS</u>: Fast construction (<10 days), low carbon footprint, no construction training required, culturally appropriate, cost effective

CONS: Cladding requires regular maintenance, insufficient protection strong winds, rain, heat & security risks.



Makeshift Shelter ²

STRUCTURE	Tree branches & trunks
ROOF	Fabric, plastic sheets, leaves
DOOR	Fabric, plastic sheet
CLADDING	Palm stems and leaves, straw, woven matts (palm leaves), fabric, plastic sheet, mosquito nets.
JOINERY	Rope, fabric

PROS: None

CONS: Insufficient living conditions, high protection risks, impacts local deforestation through uncontrolled material acquisition.



¹ Traditionally built by both IDP and host populations

² Emergency shelters built by IDPs themselves

Construction Practices

Shelter assistance is either provided as a shelter kit (70%) or through cash assistance (30%)

Most shelters are either built by beneficiaries themselves (48%) or with support from NGOs (49%).

Shelters built by a community group account for less than 4%. These groups almost exclusively build for persons with special needs or reduced mobility that were otherwise omitted from construction assistance by NGOs.

Unfortunately, most households having benefited from shelter assistance report receiving insufficient training on building or maintaining their respective shelters. 76% of households report receiving only basic information on maintenance and building materials and 95% of households report not receiving any technical training in construction and maintenance.

This gap in construction and maintenance knowledge significantly impacts the durability of the shelters built by IDPs, which account for almost half of all emergency shelters. Poor construction not only poses safety risks but increases the material turnover period, further compounding the environmental impact of shelter construction.











Conditions

67% of shelters in acceptable condition, whereas 29% are in poor condition and 4% are dilapidated.

The quality criteria for shelters were based on the adequacy in protection from the elements as well as structural safety.

Shelters in poor or dilapidated conditions were visibly impacted by the harsh climate, which appears to pose a significant threat to the durability building materials and structures. For example, extreme heat can weaken the material integrity of tarpaulins and strong winds can easily topple entire structures as well as tear away cladding, roofing, and joints.

Adequate rehabilitation of shelters using more weather resilient building materials is also diminishing due to increasing costs of materials. The rising demand and depleting supply contributed to a price surge throughout the country, significantly limiting the capacity of the shelter response.



Sanitation Waste Management

31% report practicing open defecation

Households were also surveyed on sanitation practices and facilities available in IDP settlements. 67% of households report having regular access to communal pit latrines and 25% report having access to household pit latrines. 31% report practicing open defecation (OD), which poses significant health risks in addition to the negative environmental impact.

The conditions of latrines were gauged on quality of privacy and structural safety. 62% of latrines were indicated as adequate, 27% in poor condition and 11% were dilapidated. WaSH actors in the province have also referenced significant issues in preserving emergency pit latrines due to the soil type, posing durability concerns and potential ground water contamination risks.



Latrine Pits are reinforced with sandbags



Solid Waste Management

To date there is no distinct practice of household waste management in IDP settlements, with few or no designated refuse pits or compost piles. The same can be said however about host towns and villages. This is made especially evident by the amount of waste scattered throughout and near human settlements in the province. This lack of general awareness in household waste management also impacted the margin of error in data collection.

Household waste is typically burned, buried, or left scattered.

Although many durable items are reused and recycled in IDP settlements, solid household waste is typically burned, buried, or left scattered. This can be particularly dangerous in the case of batteries among other potentially hazardous materials.



Waste handled in IDP settlements per household can be classified into the following three categories and most common contents:

	ORGANIC	SOLID WASTE	RECYCABLE
Content	Cooking scraps, vegetables, fruits, leaves, straw.	Plastic bags, feminine hygiene products, batteries, broken shoes and worn clothes.	Plastic water bottles, broken jerry cans, metal scraps.

Gauging awareness for alternatives

88% of households expressed interest in implementing sanitation waste to fertilizer system.

Given the environmental risks linked to poor sanitation practices in IDP settlements, the survey sought to assess the awareness and perception of the ecological sanitation system (ECOSAN) in the communities, as a potential alternative to help mitigate both health and environmental risks.

The ECOSAN¹ system transforms human waste into agricultural fertilizer and eliminates the need for septic tanks or pits, which significantly decreases the risk of soil and groundwater contamination. However, the system requires diligent maintenance by users and durable construction materials, which can be particularly challenging in this context, despite the ideal arid climate.

When surveyed, 71% of households reported not being aware that human excrement can be transformed into agricultural fertilizer, however 88% of households expressed interest in implementing this type of system. Out of those against, 80% indicated personal and/or cultural reservations in handling of human waste as their primary barrier, whereas some expressed reservations about odors and perceived health risks.

Reuse

Most reusable items are retained by IDP households. The most reused items are tarpaulins and plastic bottles.

Households indicated reusing worn tarpaulins as interior floor mats or covering exterior cooking areas. Used tarpaulins are also used by IDPs to construct privacy screens around latrine pits and additional makeshift shelters in the case of a growing household. Once the tarpaulins reach an advance state of deterioration they are discarded or burned.

Plastic bottles are typically reused by households as cooking oil and gasoline containers. Households indicated reusing their plastic bottles at least once, 64% of the time.



¹ By diverting and isolating liquid and solid waste, human waste is then transformed through a dehydration process.

Cooking Energy

Firewood accounts for 97% of all cooking energy in IDP settlements, whereas biogas stoves, dried African Palm fruits (dommes)¹ and animal excrement account for the remaining 3%. Households reported using roughly 8 tree branches per day for daily cooking needs, although the precise quantity was not confirmed. Most households cook on open fires as improved cookstoves (ICS) are rarely part of the NFI kits distributed by humanitarian actors.

Firewood accounts for 97% of all cooking energy in IDP settlements

Most households reported collecting firewood informally, which poses several environmental, social and security risks for the province. Collection of firewood near IDP settlements in an uncontrolled, unmoderated way risks further accelerating the rate of deforestation and desertification already occurring. Furthermore, this tendency also poses risks for intercommunity clashes over limited resources, which in turn increases exposure of women and girls to the risks of gender-based violence (GBV), as they are most often responsible for collection.



¹ Local Arab dialect name for Dried African Palm fruits (Borassus), used as an alternative to wood for cooking energy.





IMPACT ASSESSMENT

Climate change, the nature of the security crisis, the lack of basic infrastructure and the limitations of humanitarian actors due to insufficient funding has collectively resulted in the degradation of the natural environment of the Lac Province. The increasing scale of demand for wood and natural building materials has led to overuse of trees and vegetation, accelerating the desertification already occurring in the province. The lack of household and sanitation management in IDP settlements, poses the additional threat of contamination and degradation of groundwater and natural habitats.

All environmental impacts compound the existing security risks & community tensions. Three primary impacts were identified:

- Overuse of wood for shelter construction and cooking energy
- Lack of transitional & development phasing strategy and effective measures against climate change
- Inadequate solid and sanitary management

Overuse of wood for shelter construction and cooking energy

- → Unmoderated deforestation due to the predominantly informal collection of firewood as cooking energy in IDP settlements.
- → Deforestation compounded to keep up with demand for wood framing used in emergency and transitional shelter types.
- → Insufficient construction and shelter maintenance training impacting quality of shelters built, causing inadequate structural capacity, which increases reconstruction and maintenance needs.
- → Insufficient funding for durable shelter materials.

Lack of transitional & development phasing strategy and effective measures against climate change

- → Lack of a coordinated vision and strategy for the Lac Province to achieve transitional and development phases.
- → **Accelerating desertification** of the region and insufficient compensation measures in place by humanitarian actors and National Government.
- → Existing environmental initiatives are not context appropriate.
- → Construction of durable shelters in isolated, informal settlements outside the reach of basic services or livelihood opportunities, is creating a high risk of new challenges for economic, social and environmental sustainability of IDP settlements.

3 Inadequate solid and sanitary management

- → 30% of the IDP population practices OD, exposing health and environmental threats.
- → Insufficient sanitation infrastructure. Majority of latrine pits are not properly secured and at a high probability of contaminating groundwater.
- → Very poor overall awareness of waste management among IDPs and host communities, as well as government and humanitarian actors.



Analysis

The environmental impacts threaten to escalate the ongoing security crisis in the province. The scarcity of natural resources has already resulted in a surge of intercommunity clashes and violence; therefore, any further deterioration of the environment will significantly escalate the situation further.

As both displaced and host populations are predominantly agrarian, fishing, and herding communities, depleting natural resources and desertification threatens the loss of livelihood and nutrition sources as well as building materials and wildlife habitats.

Should the crisis continue to unfold without adequate environmental risk mitigation, this will inevitably compound the security situation and result in a renewed wave of displacement and violence.

The highest priority going forward is mitigating the high dependency on wood, as this activity has the largest scope and scale of environmental impact in the Lac Province. The long-term priority is to develop a transitional and development roadmap and strategy.

The short-term priority is mitigating the high dependency on wood.

The long-term priority is to develop a transitional and development roadmap and strategy.





Mitigating the overuse of wood in construction

SHORT-TERM ACTION - 1 -2 YEARS

- **1.1.** Design and distribute simple and clear pictogram information pamphlet on shelter construction methods and good shelter maintenance practices, as well as increasing training sessions for construction.
- **1.2.** Revise current shelter construction methods and designs to improve joinery and structural durability.
- **1.3.** Integrate reforestation activities within IDP Shelter & Settlement interventions.
- **1.4.** Ensure appropriate parcels sizes and distances between shelters adhere to minimum standards to decrease fire risks.
- **1.5.** Consultations with IDP communities to ensure durable shelter model is culturally appropriate and relevant to household needs.

LONG-TERM INTERVENTION - 2+ YEARS

1.6. Incremental increase of durable shelter construction and upgrading of transitional shelters.



Tukul House - Tunaydbah Refugee Settlement, SUDAN, 2021 © ACTED





Planning & Documenting Integrated IDP Settlements

SHORT-TERM ACTION - 1 -2 YEARS

- **2.1. Prepare settlement site plans**, including shelter parcels, zoning for agricultural and environmental conservation activities, for all new construction projects (based on SPHERE Standards¹ and the UNHCR Guiding Principles for a Master Planning Approach ²) to:
- a) Adequately plan, implement and monitor "greening" initiatives to compensate for shelter construction, and mitigate flash flooding/desertification impacts on agricultural activity.
- b) Initiate documentation of shelters constructed using site plan indexing, to assure an efficient monitoring of rehabilitation and upgrading.

LONG-TERM INTERVENTION – 2+ YEARS

- **2.2. Support the provincial government in the master planning** of two integrated IDP-Host community developments in Baga Sola and Bol Towns to:
- a) Cluster populations in support of decreasing environmental and protection risks related to isolated and sprawling sites.
- b) Include IDPs and host communities in the planning process of settlements.
- Align humanitarian interventions to support transitional and durable development projects as well as the National Development Plan through the Humanitarian-Development Nexus working group.
- d) Identify key infrastructure and basic service capacities required for socioeconomic resilience of both IDP and host communities.

https://spherestandards.org/wp-content/uploads/Sphere-Handbook-2018-EN.pdf

2 UNHCR Master Planning Approach

https://intranet.unhcr.org/content/dam/unhcr/intranet/protection-operations/shelter-settlement/doucments/english/settlement/master-plan/MPA%20Guiding%20Principles Low%20Resolution.pdf



¹ SPHERE Humanitarian Standards Handbook



Green cooking energy & ICS

SHORT-TERM ACTION - 1 -2 YEARS

- 3.1. Distribution of ICS as part of Standard NFI kits.
- **3.2.** Piloting the distribution and use of alternative cooking energy available and conducting a supply chain analysis for larger scale distribution in IDP sites.

LONG-TERM INTERVENTION – 2+ YEARS

3.4. Piloting the use and manufacturing of alternative cooking energy, such as briquettes, biogas, etc.



Improved Cookstove - Kakuma Refugee Camp, KENYA, 2017 © UNHCR | S.Otieno



Waste Management

SHORT-TERM ACTION - 1 -2 YEARS

- **4.1.** Building awareness on composting, waste sorting and the environmental impacts of poor waste management.
- **4.2.** Construction of designated and secured solid waste pits.
- **4.3.** Increase collaboration with WaSH Cluster in latrine construction, sanitation infrastructure and an awareness campaign on OD health and environmental risks.
- **4.4.** Building awareness for using baskets made from local materials (woven palm leaves) for shopping and resource collection to decrease dependency on plastic bags.

LONG-TERM INTERVENTION - 2+ YEARS

- **4.5.** Cost analysis of ecological sanitation latrine system construction, waste management systems and composting centers in formal IDP Sites.
- **4.6.** Piloting recycling & composting projects.



Composting Center - Maratane Refugee Camp, MOZAMBIQUE, 2021 © UNHCR

ANNEX

Questionnaire used (only available in French)

https://enketo.unhcr.org/x/dnPXKmM7

- 1. Shelter/NFI Cluster Chad Dashboard (only available in French)
- 2. Additional Photos

2021 Shelter/NFI Cluster Chad Dashboard (FRENCH):

https://bit.ly/34svTfq

