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A Sustainable and Resilient Response to the Housing and Reintegration Problems of Displaced People from the NOSO's Crisis Situations in Cameroon

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Abstract:- The aim of this article is to present a comprehensive analysis of the living conditions and propose support mechanisms for displaced people from conflict zones in the NOSO who have taken refuge in the West region of Cameroon and a peace and security survey, focusing specifically on the Tchoualé neighborhood in Dschang. It highlights the need for improved services and facilities to adequately address the challenges faced by these populations. Through a detailed assessment, the research identifies gaps between existing services and the actual needs of the displaced, utilizing a SWOT analysis to provide insights into the current environment. Recommendations are proposed to enhance the capabilities of existing centers, expand service offerings, and involve displaced individuals more actively in center management. The article also outlines an adaptive architectural approach for designing a sustainable and resilient reception center that meets the unique needs of the displaced. Key architectural objectives, principles, and site-specific considerations are examined, including the use of local materials and eco-friendly construction techniques. This work contributes to a broader discussion on effective humanitarian responses, offering insights into the future of support systems for displaced populations in Cameroon and similar contexts.

Keywords:- *Resilient Reception Center; Displaced Individuals; Sustainability; Cameroon.*

I. INTRODUCTION

In this article, we begin by examining the living conditions and support systems for displaced individuals from conflict zones in the West Region of Cameroon, with a specific focus on the Tchoualé neighborhood in Dschang. This analysis highlights the pressing challenges faced by these communities and the need for comprehensive solutions. Following this, we outline our conceptual approach to the design and modeling of a reception center tailored to meet the specific needs of these displaced populations. Finally, we will present the evaluation report of the project, detailing its potential impact and effectiveness in providing sustainable support for vulnerable individuals in the region.

II. REPORT ON THE ANALYSIS OF LIVING CONDITIONS AND CARE FOR DISPLACED PERSONS FROM CONFLICT ZONES IN THE GREATER WESTERN CAMEROON

In response to the humanitarian crisis stemming from armed conflicts in Cameroon's Anglophone regions and chronic insecurity in the Far North, numerous reception and care centers for displaced populations have been established by national authorities, humanitarian organizations, and local communities. Documentary research on existing reports and standards at key reception sites in the region, combined with surveys and interviews conducted in the selected reception area, allowed us to produce a report aimed at evaluating the effectiveness and quality of these assistance mechanisms. This was done by analyzing the alignment between the services provided by the reception centers and the actual needs of displaced populations, identifying the main strengths, weaknesses, opportunities, and threats of the existing centers, and concluding with recommendations to improve the care and support for displaced persons.

A. Site Presentation

- *Context*

Since 2016, Cameroon's Anglophone regions, specifically the Northwest and Southwest, have been the battleground of an armed conflict between government forces and separatist groups seeking independence for these regions. Documentary research revealed that the violence, clashes, and atrocities committed by the various parties involved in the conflict have forced over 500,000 people to flee their homes and seek refuge in safer areas within the country, often hosted by local communities. The Greater West region, consisting of the administrative regions of the West, Southwest, and Northwest, has been particularly affected due to its geographical proximity to the conflict zones, becoming a refuge for many civilians.

In response to this humanitarian crisis, local authorities, humanitarian organizations, and communities have established reception and care centers for displaced populations. However, few studies have been conducted to evaluate the effectiveness and quality of these assistance mechanisms in the Greater West. This analysis aims to better understand the strengths, weaknesses, opportunities, and threats of these reception and care centers for displaced persons.

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➢ *Location*

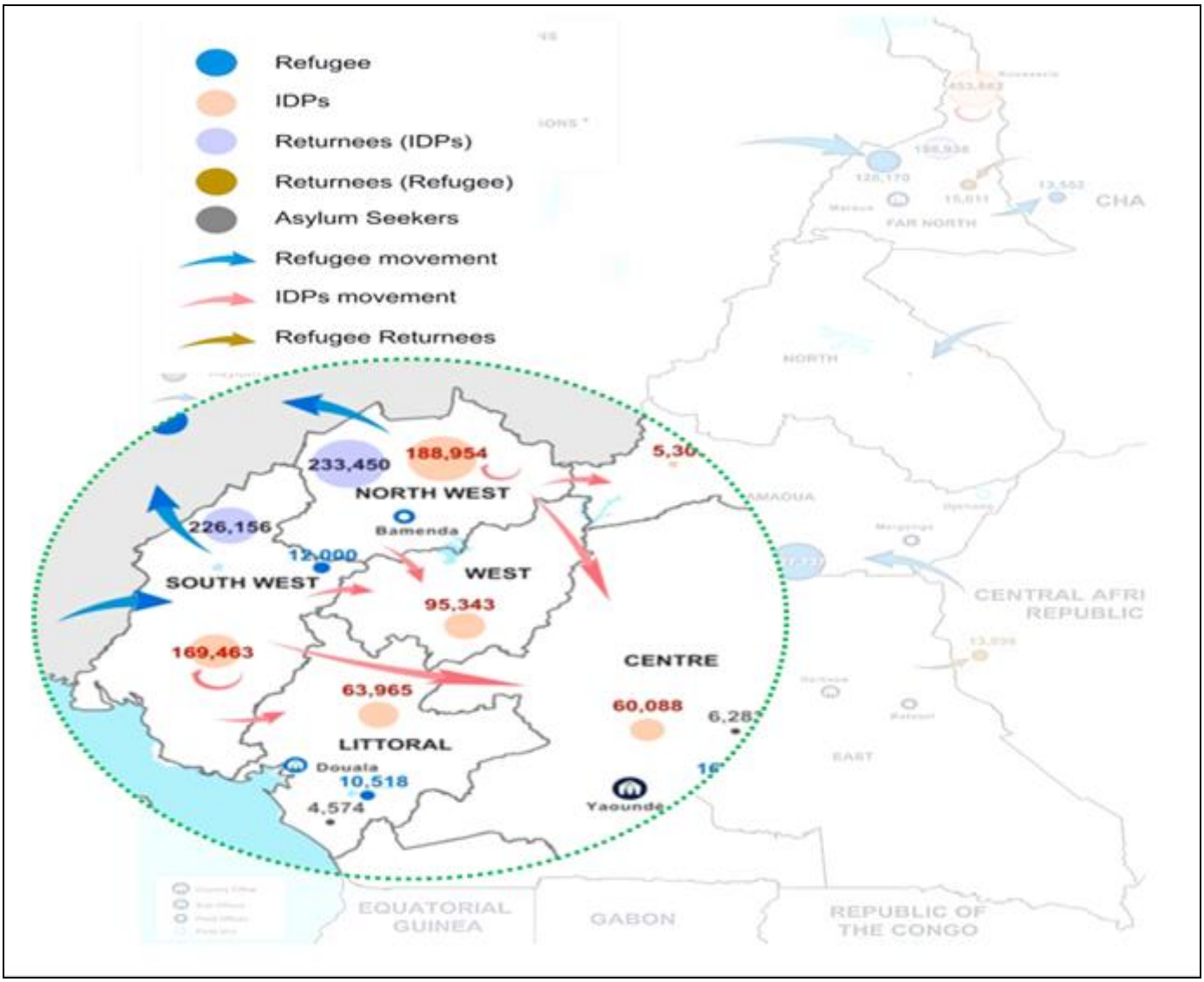

Fig 1: Conflict Zones and Displacement in Greater Western Cameroon (source: IOM, OCHA, UNHCR April 2024)

The Greater West of Cameroon is an administrative area comprising three main regions: the West, Southwest, and Northwest. Specifically:

- The Northwest region is one of the Anglophone regions in crisis. It shares borders with the Southwest to the west and south, Adamawa to the northeast, Nigeria to the northwest, and the West to the east. See Figure 1.
- The Southwest region is the second area affected by the conflict. It is located in the far southwest of the country, bordered by the Atlantic Ocean to the west, Nigeria to the northwest, the Northwest region to the east, and the Littoral region to the northeast. See Figure 1.
- The West region is geographically very close to these two conflict zones, making it a key reception area for displaced populations fleeing violence. See Figure 1.

As a whole, the Greater West region plays a crucial role in managing the humanitarian crisis caused by the conflict in the Anglophone regions. Its unique geographic position at the heart of the crisis made it the focus of our study, aimed at analyzing the humanitarian response and the effectiveness of the reception centers established in this region.

B. Presentation of Key Findings

The documentary research, interviews, and surveys conducted as part of our study allowed us to identify several key findings, which are reorganized and presented in the paragraphs below.

➢ *Alignment Between Services Offered and the Needs of Displaced Populations*

The evaluation of the alignment between the services offered and the needs of displaced populations is generally summarized in Table 1 below. This table takes into account the key findings and their impact on our target population, with bullet codes assigned to assess the magnitude of these impacts, as explained in the accompanying legend.

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Table 1: Summary and Interpretation of Findings from Collected Data

Legend: *: Low **: Medium ***: High ****: Very High			
No.	**Findings**	**Consequences**	**Level**
1	Reception centers provide temporary shelter	Makeshift housing	***
		Overcrowding, lack of privacy	***
		Limited access to electricity	***
2	Basic food assistance is limited	Limited access to drinking water	***
		Limited access to sanitation	***
		Undernutrition and malnutrition	***
3	Restricted access to basic services	Insufficient infrastructure	***
		Difficult access to healthcare	***
		Difficult access to education	****
4	Increased vulnerabilities of specific groups, particularly: single women, unaccompanied children, the elderly, or people with disabilities	Increased risk of violence	**
		Increased risk of exploitation	**
		Increased risk of abuse	***
		Risk of stigmatization	**
		Risk of discrimination against displaced people	**
		Difficulty integrating into the community	***
5	Displaced persons face broader needs, particularly in terms of employment, psychosocial support, and long-term integration	Difficulty accessing employment	****
		Tensions with host communities	**
		Competition for resources and opportunities	***
		Risk of stigmatization	**
		Risk of discrimination against displaced people	**
		Strong dependence on short-term humanitarian funding	****
6	Challenges with coordination and sustainability of centers	Lack of synergy between different actors involved	***
		Lack of harmonization of services and reception conditions	***

➢ *SWOT Analysis of Living Conditions and Care for Displaced Persons*

A SWOT (Strengths-Weaknesses-Opportunities-Threats) analysis of the living conditions and care of displaced persons in the Grand West of Cameroon is of critical importance. This SWOT analysis provides a comprehensive and balanced assessment of the situation by identifying both the strengths and weaknesses of the support systems in place. It helps to gain a clear and nuanced understanding of the reality on the ground, beyond subjective perceptions or political rhetoric. It objectively evaluates the current situation, helps to understand the challenges on the ground, directs priorities and intervention strategies, and also promotes coordination and mobilization of the actors involved. The results are presented in Table 2 below.

Table 2: Analysis of Living Conditions and Care for Displaced Persons in the Grand West of Cameroon

S **Strengths**	**W** **Weaknesses**	**O** **Opportunities**	**T** **Threats**
Mobilization and involvement of local authorities and host communities Existence of emergency shelter and aid distribution structures Cooperation between various humanitarian actors	Limited capacity of shelters and care centers to handle the massive influx of displaced persons Lack of funding and resources for long-term support Poor living conditions in the centers (hygiene, security, privacy) Low involvement of displaced persons in the management of the centers	Growing mobilization of the international community and donors Existence of economic and social reintegration programs for displaced people Willingness of authorities to strengthen the resilience of affected communities	Risk of tensions and conflicts with host communities Deterioration of the security situation and resumption of violence Fatigue and depletion of resources in reception centers

This SWOT analysis helps to understand the situation as a whole, guide intervention priorities, and foster a more effective and sustainable humanitarian response.

- The analysis of strengths and weaknesses highlights the main challenges faced by displaced populations and reception centers.
- Identifying opportunities and threats helps to grasp the broader dynamics (political, economic, security, etc.) that influence the situation.
- It helps to target priority areas, allocate resources wisely, and design interventions that meet the actual needs of displaced people.

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- By identifying strengths and opportunities, the SWOT analysis allows us to leverage existing local resources and capacities.
- This analysis contributes to the development of programs aimed at strengthening the long-term resilience of communities affected by forced displacement.

The results of the SWOT analysis provide a solid foundation for formulating recommendations and defining relevant action plans.

C. Formulation of Recommendations

Based on the findings and results of the analysis, we propose the following recommendations to improve the care and support for displaced populations in the Grand West.

➢ *Strengthening the Capacity of Existing Shelters and Support Centers*

This recommendation aims to :

- Increase the financial and logistical resources allocated to reception centers;
- Build new shelters in the most affected areas;
- Improve living conditions in the centers (sanitation facilities, security, privacy).

➢ *Expanding the Services Offered to Displaced Persons*

This recommendation aims to:

- Implement psychosocial support and trauma care programs;
- Facilitate displaced persons' access to education and vocational training;
- Develop economic integration initiatives (microcredit, apprenticeships, etc.).

➢ *Involving Displaced Persons More in Center Management*

This recommendation aims to:

- Promote the participation of displaced persons in decision-making processes;
- Encourage self-organization and empowerment of displaced communities;
- Value the skills and expertise of displaced persons in managing the structures.

➢ *Enhancing Coordination Among Humanitarian Actors*

This recommendation aims to :

- Improve communication and information sharing among different stakeholders;
- Define a common and coherent strategy for responding to the displaced persons' crisis;
- Mobilize new partners and resources for more sustainable assistance.

➢ *Supporting Host Communities*

This recommendation aims to:

- Implement social cohesion and intercommunity dialogue programs;
- Strengthen infrastructure and basic services in areas hosting displaced persons;
- Support host communities in managing the influx of displaced persons.

➢ *Protecting the Most Vulnerable Groups*

This recommendation aims to:

- Establish mechanisms for preventing and responding to violence;
- Provide specific assistance to women, children, and individuals with special needs;
- Promote social cohesion and peaceful coexistence;
- Develop reconciliation and peacebuilding initiatives.

➢ *Harmonizing and Strengthening Services Offered by Reception Centers*

This recommendation aims to:

- Diversify funding sources and strengthen management capacities;
- Implement monitoring, evaluation, and accountability mechanisms;
- Redefine minimum standards in terms of capacity, infrastructure, and services;
- Develop a differentiated approach to address the specific needs of vulnerable groups.

Implementing these recommendations will substantially improve the quality of support and care for displaced populations in the Grand West of Cameroon.

D. Analysis Summary

This stage of our work emphasizes the urgency of taking action to improve the living conditions and care for displaced populations in Cameroon, particularly in the Grand West region. It allowed us to present the findings and interpret the collected data, analyze them to identify the strengths, weaknesses, opportunities, and threats related to the living conditions and care for displaced persons in the West following the Anglophone crisis. Additionally, recommendations were made to substantially improve the quality of humanitarian assistance. In the same vein, to disseminate the results of our critical analysis and ensure a better approach to designing reception centers as a humanitarian response to displacement needs in Cameroon, we have developed a note presenting a sustainable approach to be adapted for the design of reception centers.

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III. PRESENTATION NOTE OF THE ADAPTED APPROACH FOR DESIGNING A SUSTAINABLE AND RESILIENT RECEPTION CENTER IN RESPONSE TO THE NEEDS OF DISPLACED PERSONS

This approach primarily builds on the recommendations from our critical analysis to prescribe a suitable methodology for integrating these recommendations into the humanitarian response process. To achieve this, the developed approach is structured around a context, challenges, guiding objectives, design principles, and layout provisions for designing a center that aligns with the intended humanitarian response objectives of our study.

A. Context and Challenges Reminder

The massive displacement of populations due to armed conflicts in Cameroon, particularly in the NOSO regions, creates urgent needs for shelter and support. In our work on studying the design of a sustainable reception center for displaced persons with projections for resilient humanitarian responses, we must address various challenges: human dignity, security, environmental sustainability, and resilience and adaptation. The architectural approach must therefore be innovative, adaptable, and centered not only on the needs of users but also on those of host communities.

B. Formulation Of Objectives For The Architectural Approach

The recommendations from our critical analysis have led us to formulate four main objectives to be achieved through this approach. These objectives are as follows:

➢ *Create a Safe and Welcoming Environment:*

Ensure the physical and psychological safety of displaced persons.

➢ *Promote Autonomy and Integration:*

Design spaces that encourage social interaction and economic activities.

➢ *Minimize* Environmental, Economic, and Social Impact:

Use sustainable materials and eco-friendly, local construction techniques. Establish a simple and accessible construction system for the local workforce.

➢ *Ensure Flexibility and Modularity:*

Allow for adaptations based on the evolving needs of the hosted populations.

C. Choice of Actions and Guiding Architectural Design Principles

To achieve our objectives, we base our work on the following principles:

➢ *Bioclimatic and Iterative Design*

- Utilize building orientation to maximize natural light and ventilation.
- Incorporate solar protection elements to reduce cooling needs.
- Emphasize participatory, scalable, and adaptive design.

➢ *Local and Sustainable Materials*

- Prioritize the use of locally available materials to reduce costs and carbon footprint.
- Select eco-friendly materials such as bamboo, earth, and straw.

➢ *Multifunctional Spaces*

- Design adaptable spaces that can serve various purposes (housing, workshops, community spaces).
- Create common areas to encourage interaction and solidarity among displaced persons.

➢ *Accessibility and Security*

- Ensure accessible entrances for people with reduced mobility and children.
- Implement security measures (lighting, surveillance, space planning) to guarantee the protection of residents.

➢ *Integrated Service Infrastructure*

- Integrate health, education, and psychological support services within the center.
- Provide dedicated spaces for vocational training and entrepreneurship to promote economic autonomy.

D. Incorporate Solar Protection Elements to Reduce Cooling Needs.

This includes the main sectors and facilities of the center, which are:

- Residential Area: Housing spaces suitable for families, featuring private living units and shared spaces.
- Community Area: Multipurpose rooms, meeting and exchange spaces, community gardens.
- Service Area: Health centers, psychological support offices, educational spaces.
- Sustainable Technical Systems: Rainwater management systems, solar panels, waste composting.

This architectural conceptual approach aims to design a reception center that not only meets the immediate needs of displaced persons but also promotes their dignity, autonomy, and integration into a sustainable and resilient environment. By placing displaced persons at the heart of the design process, this initiative aspires to create a space that enables them to rebuild their lives in safety and dignity.

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IV. PRESENTATION OF THE ARCHITECTURAL PROJECT: THE TCHOUALÉ CENTER

This section presents the results of the design and modeling of our reception center in line with the previously developed conceptual approach.

A. Site Study

➢ *History and Justification for Site Selection*

Due to its direct proximity to the conflict zones in the NOSO, the city of Dschang has become a refuge for many displaced individuals as a result of the Anglophone crisis. Like the city center, several other neighborhoods on the periphery have welcomed a significant number of displaced families, particularly Pedgroom, Ngui, Madagascar, Tsinkop, Grande Mission, Tsinfem, and Tchoualé. Tchoualé is the site where we propose to establish our project. It is located near the city center, approximately 250 FCFA by motorcycle, which facilitates access to the city's amenities and infrastructure, thereby enhancing the reintegration of displaced individuals residing in the city. The neighborhood hosts a diverse population, mainly consisting of local families, students, young workers, and displaced persons. This diversity fosters a friendly and dynamic atmosphere. The influx of these new residents has often led to overcrowding and pressure on local resources, informal housing construction, and a lack of job opportunities for young people. Despite the proximity of educational institutions, challenges remain regarding access to quality education, primarily due to overcrowded classrooms. Access to clean water, electricity, and sanitation continues to be a concern, with sometimes inadequate infrastructure. Implementing such a project in this area is a strong point not only for the displaced but also for the host community, contributing to the development of the region. (See Figure 2)

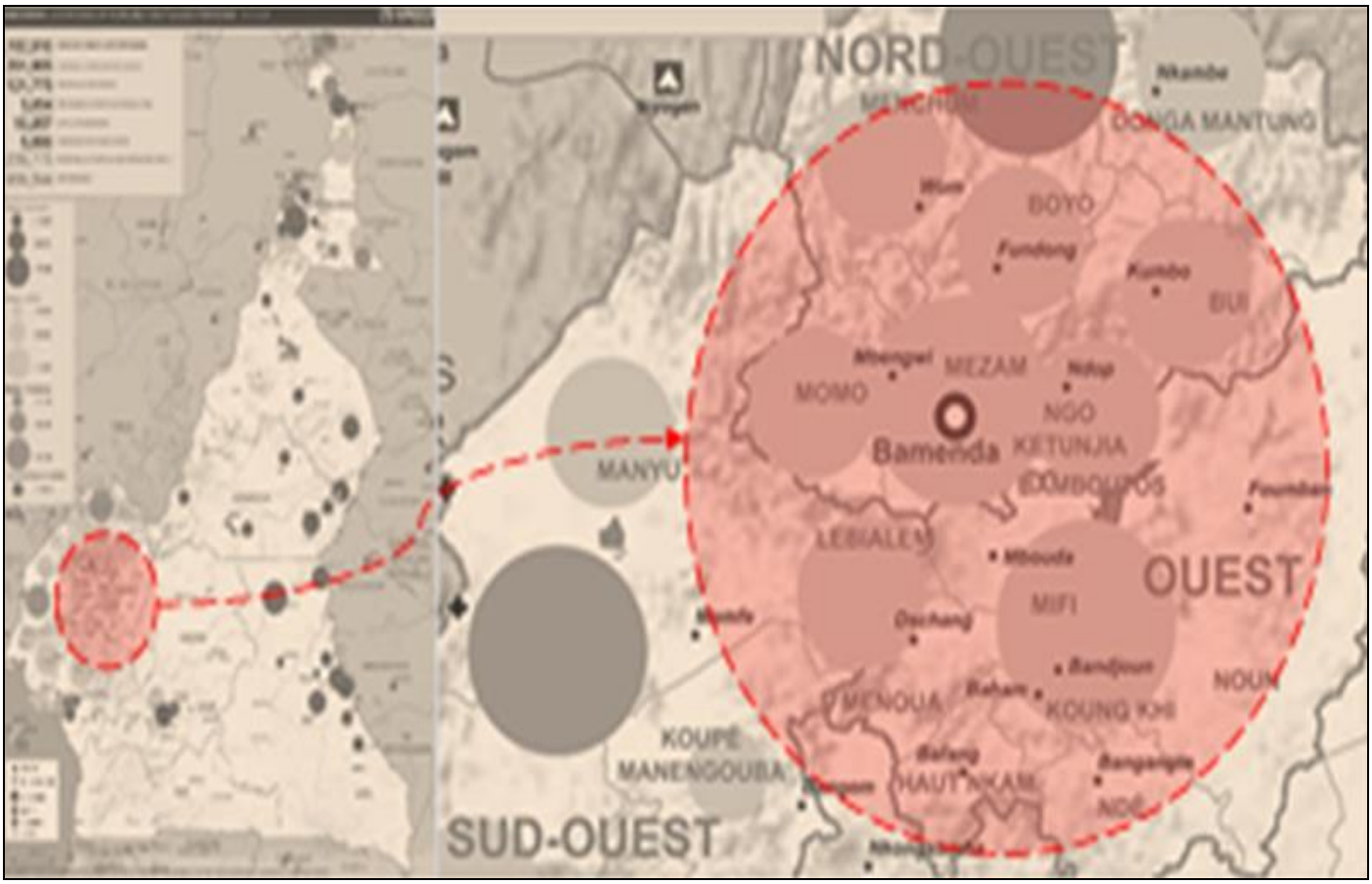

Fig 2: Boundaries and Refuge Zones for Displaced Persons in the NOSO
Source: UNHCR, April 2024

➢ *Location*

Tchoualé is close to the locality of Menouet and the Mingou neighborhood, not far from the city center of Dschang, making it accessible and near major infrastructure such as markets, educational institutions, and public services. Public transportation options, such as taxis and motorcycle taxis, frequently serve the area. The topography of the site features a dual slope primarily oriented from north to south, promoting optimal exposure to natural light. (See Figure 3)

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Fig 3: Location of the Proposed Site (Source: mapcart.com)

The main slope has a gentle incline, facilitating access and development, while the secondary slope is used to orient gardens and vegetable plots. The land area is sufficiently large to accommodate various infrastructures (buildings, green spaces), and the well-drained soil is ideal for construction but requires geotechnical studies to confirm stability. The roads leading to the site are in good condition, facilitating access for visitors and staff. (See Figure 4)

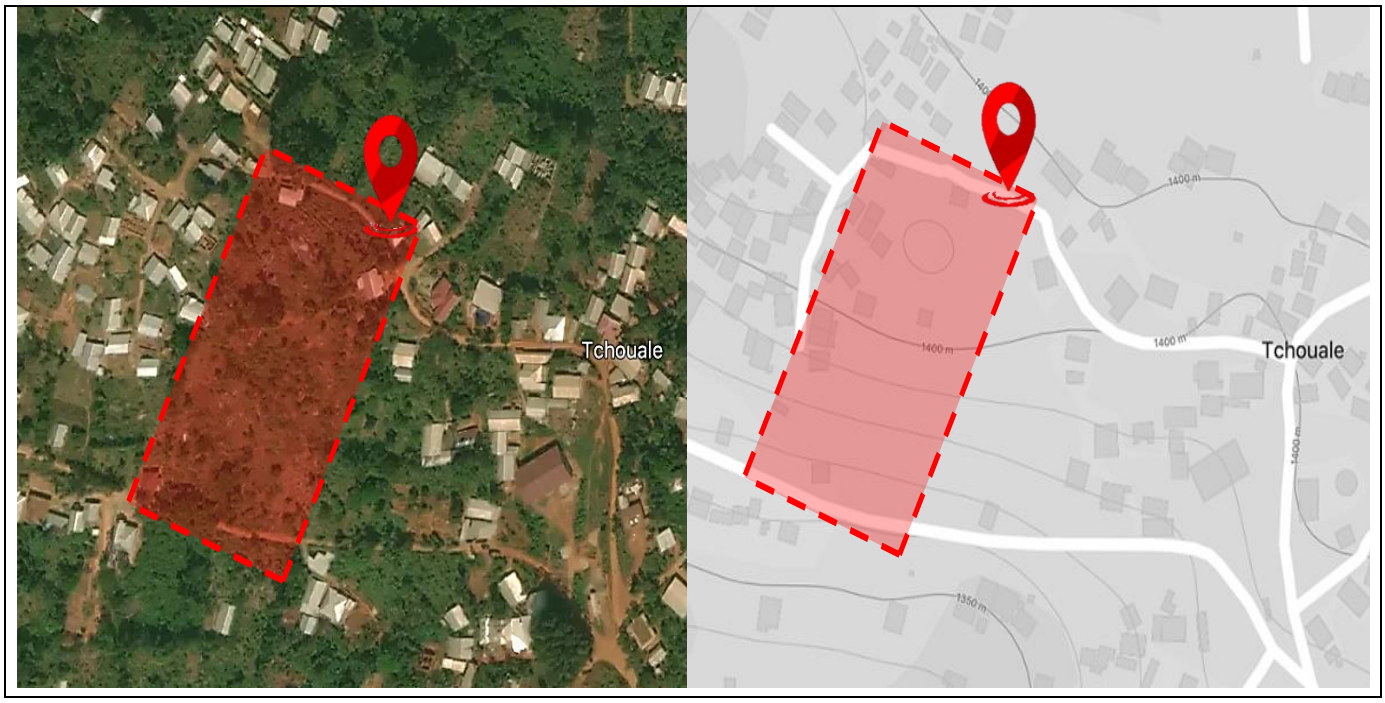

Fig 4: Location of the Project Site

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➢ *Climate*

The city of Dschang is situated at an altitude of about 1,400 meters, giving it a temperate climate, often described as one of the most pleasant in the country.

➢ *SWOT Analysis of the Site*

Table 3: SWOT Analysis of the Site

Strengths	Opportunities
• Proximity to the current gathering zone • Existing supply structures	• Growing mobilization of the local community for construction • Existence of means for economic and social reintegration of the displaced
Weaknesses	**Threats**
• The site is not state-owned but privately owned by locals • Lack of detailed historical data on the reception area	• Risk of tensions and conflicts with host communities • Necessity of thorough geotechnical studies to ensure safety for future occupants

B. Architectural Program

The architectural program of the center stems from the needs of displaced people, as assessed in previous chapters and paragraphs, and is organized according to the prioritization of these needs. For this project, we will have:

➢ *Reception And Services Area*

Where displaced individuals can register and be directed to available services, including:

- Infirmary
- Community kitchens
- Dining halls
- Sanitary blocks (showers, toilets, laundries)
- Center management and administration offices
- Technical rooms (storage)

➢ *Residential Zone*

Modular spaces that can be quickly adapted to the needs of families, with a total capacity of 200 people, including:

- Modular and scalable housing units (apartment/house-type), flexible design to adapt to evolving needs, comfortable and adapted interior layouts (living room, sleeping areas, shower, storage spaces)
- Sanitary blocks (showers, toilets, laundries)

➢ *Community Zone*

To foster social interaction, these spaces are also intended for educational and recreational activities, including:

- Relaxation and social spaces (playgrounds, shared courtyard areas)
- Artisan production workshops

➢ *Education Spaces*

Learning spaces for children and adults, providing access to formal and informal education, areas for skill training, allowing displaced individuals to gain practical skills for their autonomy, including:

- Multipurpose rooms for group activities (meetings, workshops, training)
- Library/media center
- Central courtyard

➢ *Outdoor Spaces*

Areas for growing edible plants, livestock, contributing to food self-sufficiency and offering relaxation spaces, including:

- Vegetable gardens (cabbages, lettuce, etc.) and a field of Artemisia (an anti-malaria plant), and a farm
- Small-scale cultivation and livestock areas
- Rainwater collection and storage systems.

C. Architectural Concept and Organigrams

"Community at the heart of functions for an architecture that respects the threshold between public and private spaces in humanitarian responses."

The main idea of this approach is to place the community at the center of architectural design. This means that the spaces should not only meet individual needs but also encourage social interaction and strengthen community ties. Shared spaces are easily accessible and welcoming to foster meetings and exchanges.

The mass organigram below links and connects the major components of the center's architectural program (see Figure 5).

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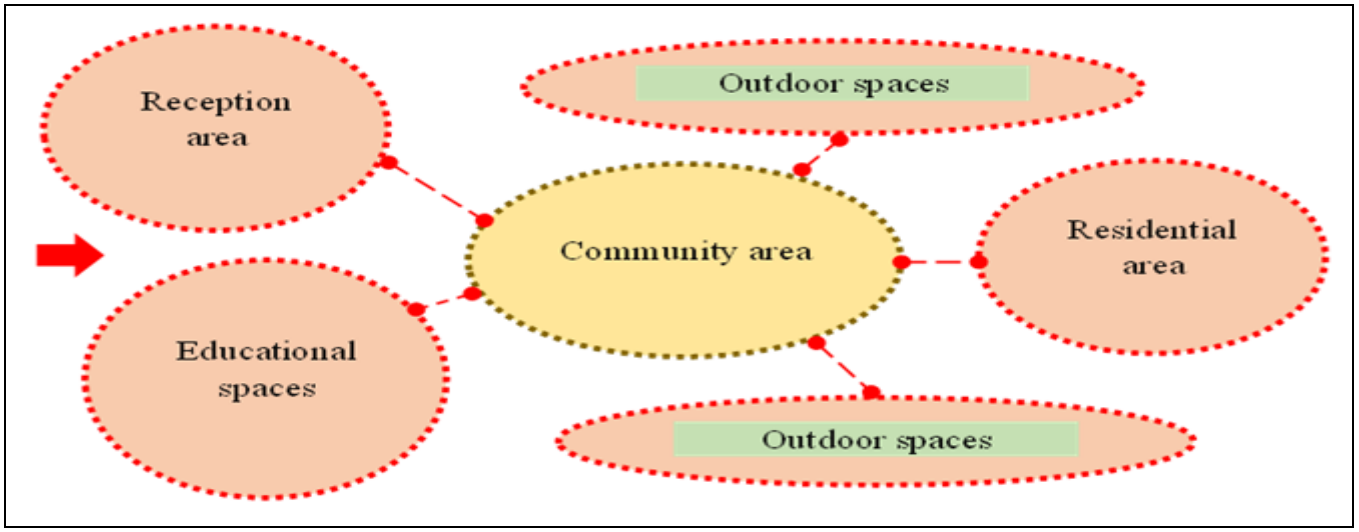

Fig 5: Mass Relational Diagram

Respecting the thresholds between public and private spaces is emphasized in our project. Private spaces, such as the housing for displaced people, provide a sense of security and privacy. At the same time, public spaces, like meeting areas and community infrastructure, are designed to encourage conviviality and collaboration. Design elements, such as doors, façade rhythms, woven mats as awnings, and transitional spaces, help define these thresholds while maintaining a visual and physical connection between the two types of spaces. (See Figures 6 and 7)

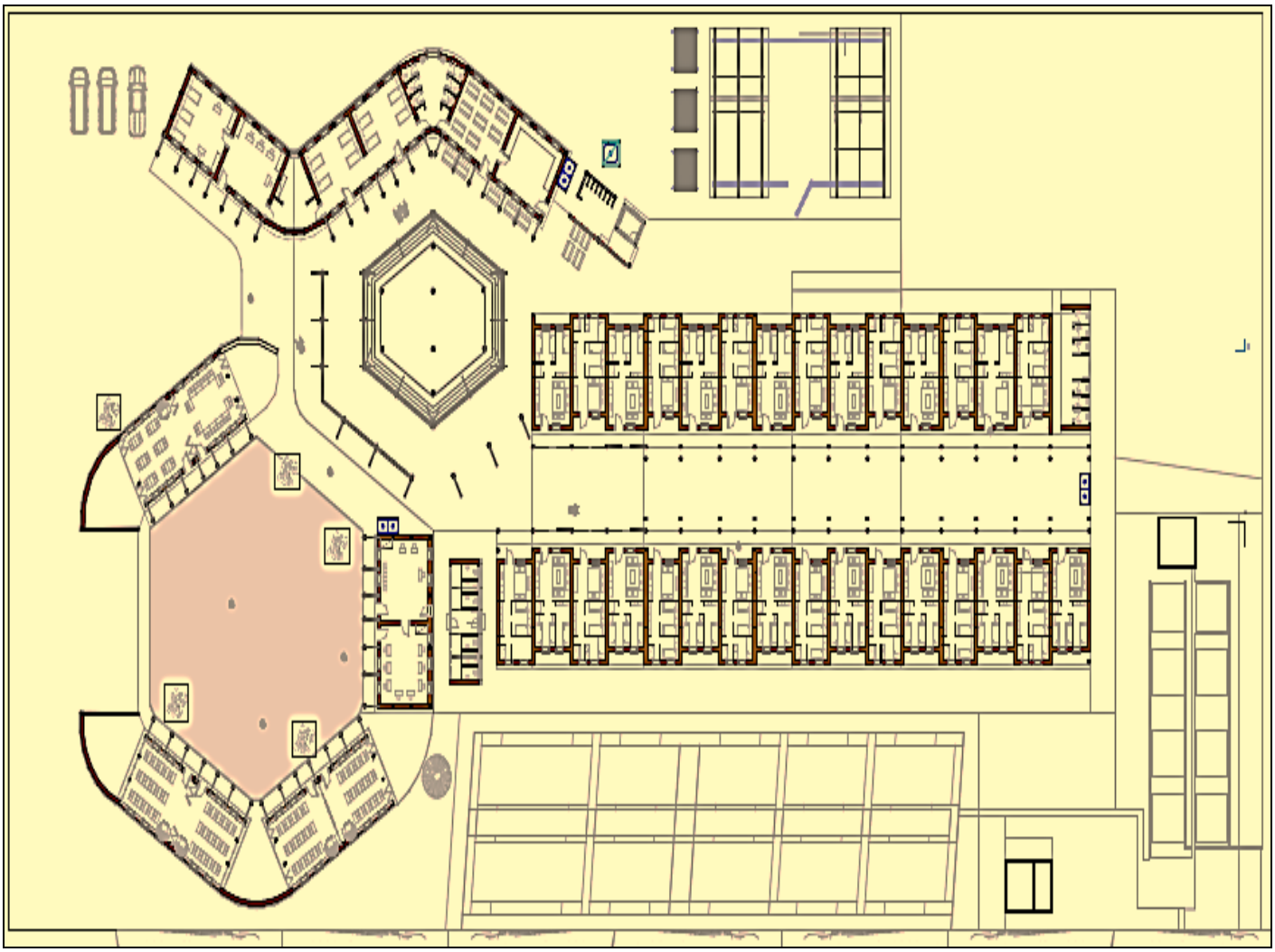

Fig 6: Functional Diagram of the Different Components of the Project

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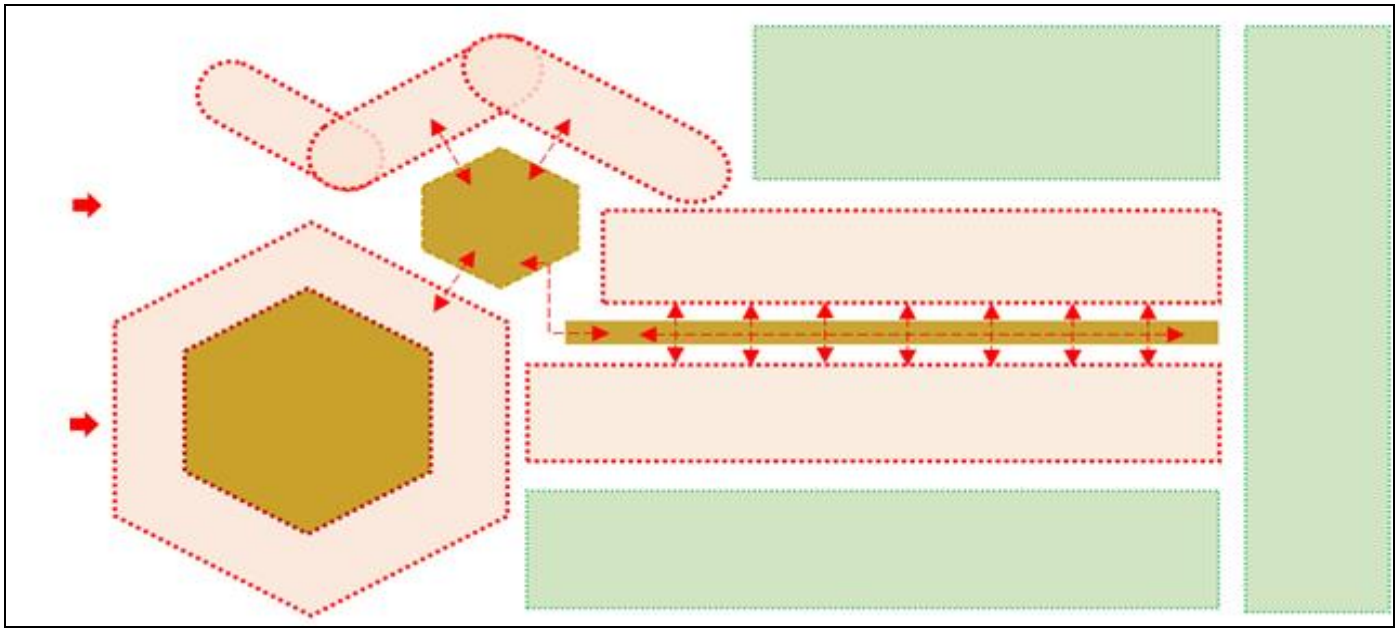

Fig 7: Layout Plan of the Tchoualé Center

D. Project Description

➢ *Construction Systems and Techniques*

The construction systems and techniques adopted for the center reference those used in the Xewa Sowé orphanage center. Specifically, unstabilized rammed earth is employed (see Figure 3.7). A clarification is necessary that the project could also be realized using compressed earth bricks made on-site. However, we opted for the rammed earth technique to optimize the project's implementation time.

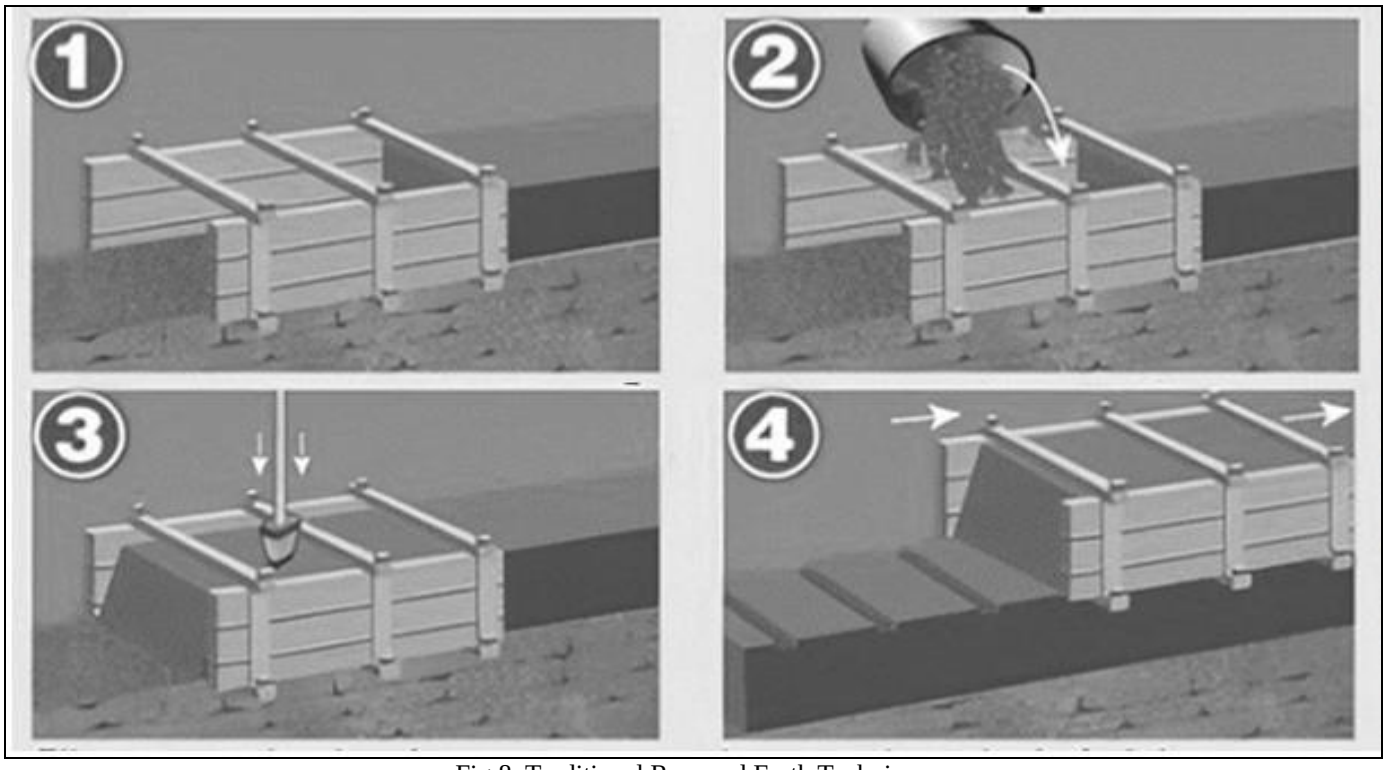

Fig 8: Traditional Rammed Earth Technique

The construction system chosen allows for the project's construction to be carried out manually, with the help of the local community, from foundation excavation to roofing. As a result, the gray energy required for the center's construction is significantly reduced.

➢ *Construction Materials*

The materials used for the project include:

- Earth for the floors (see Figure 9) and the walls (see Figure 10).

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Fig 9: Earth for the Floors

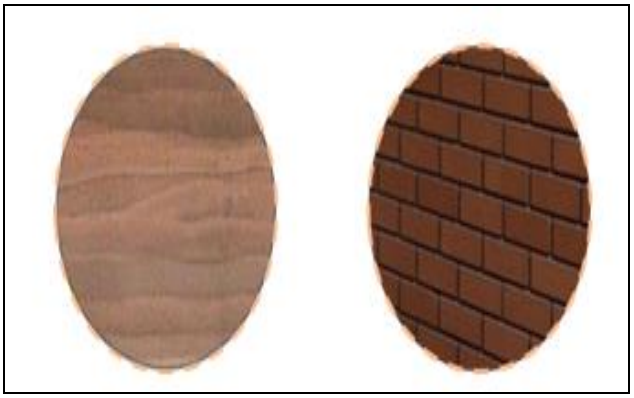

Fig 10: Earth for the Walls

Raw bamboo is used for interior partition walls in emergencies (see Figure 11), for ceilings and facade awnings, and for the building structure (see Figure 12). However, it will degrade over a few years and will need to be replaced with treated bamboo.

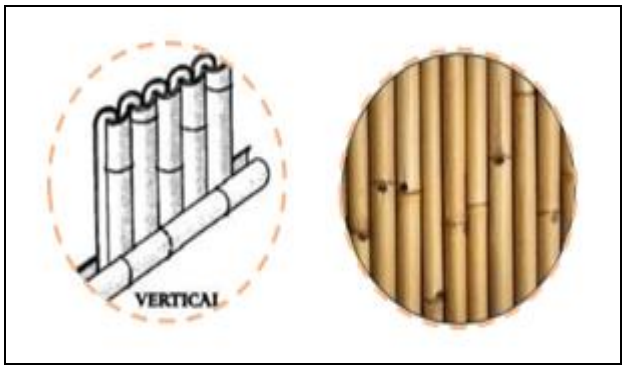

Fig 11: Bamboo Partition Wall

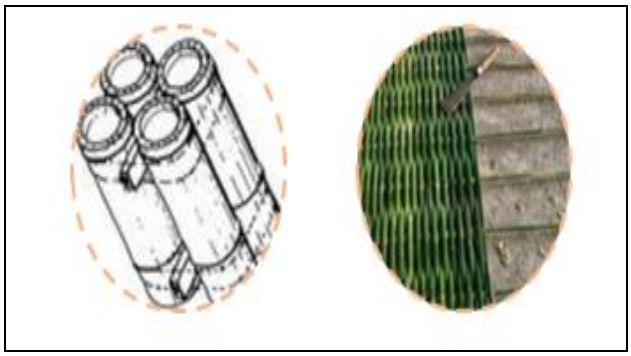

Fig 12: Bamboo Structure and Bamboo Ceiling Awning

- Local fabrics and tarpaulins provided by humanitarian aid agencies such as UNHCR are used for internal partitions in the emergency construction phase of the centre. See Figure 3.13.

Fig 13: Local Fabrics and Tarpaulins

- Straw (woven palm mats) or hay with tarps as roofing material, which will need to be replaced every year for long-term use. (See Figure 14).

Fig 14: Bamboo Ceiling Awning

The inherent qualities of the materials used and the shape of the roofs ensure that the buildings are naturally ventilated. Thanks to the thermal inertia and lag of raw earth, along with the natural insulation provided by the straw, the interiors are naturally temperature-regulated, cool during the day, and warm at night.

Buildings housing electrical equipment will be covered with corrugated iron sheets for safety. Residential buildings are roofed with straw laid over tarps to maintain a cool interior and ensure better roof waterproofing.

All the materials used are available in the city of Dschang, contributing positively to the local economy while significantly reducing the project's carbon footprint. This proximity also helps reduce both the economic and environmental costs of transportation and thus the overall project cost.

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➢ *Scalability Criteria: Construction Phases of the Center*

To ensure a better fit for various humanitarian response contexts, the proposed project is designed to be implemented in three phases, following the evolutionary processes of humanitarian responses, as presented in Figures 15 and 16.

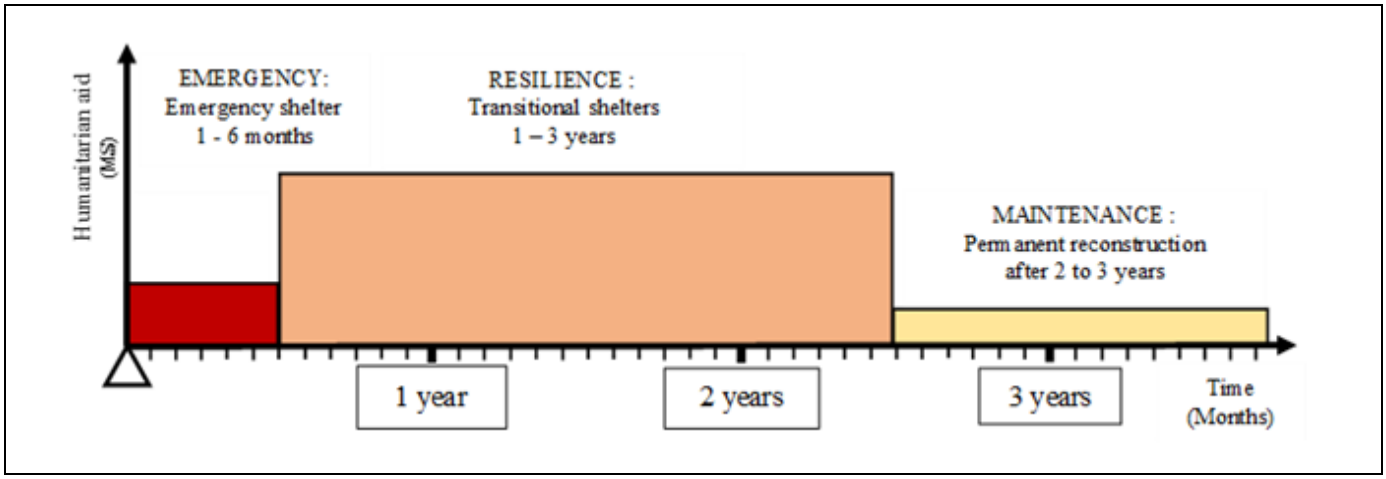

Fig 15: Distribution of Humanitarian Responses Over Time

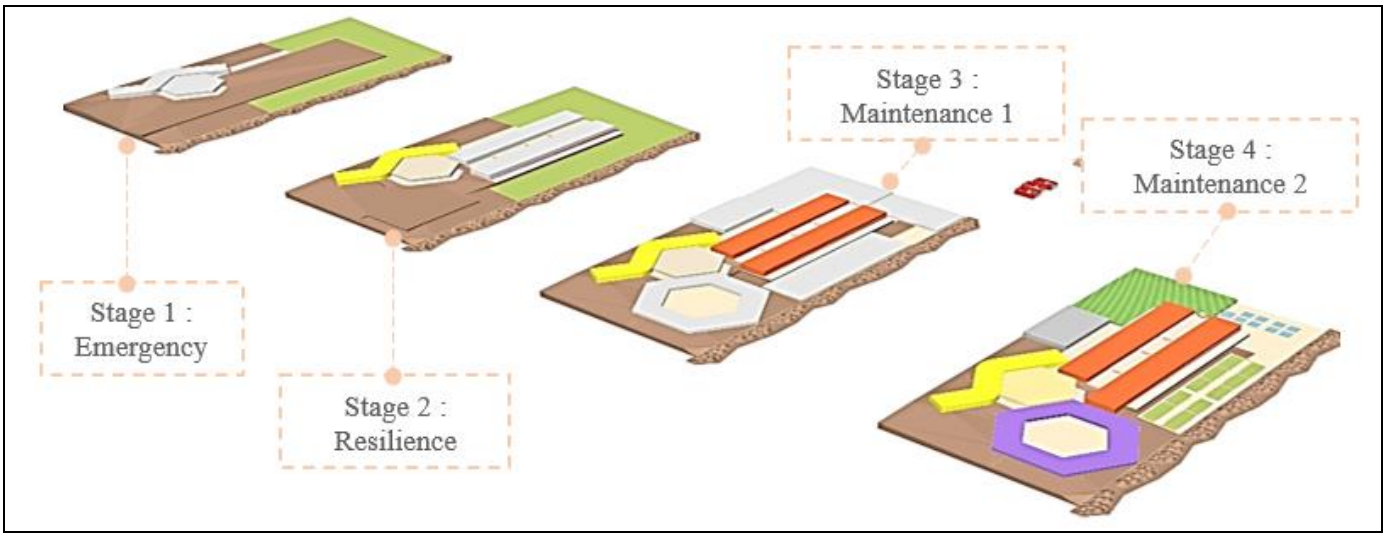

Fig 16: Center Construction Phases

- *Stage 1: Emergency*

This stage involves the setup of primary response infrastructure, particularly reception services and healthcare (see Figure 17).

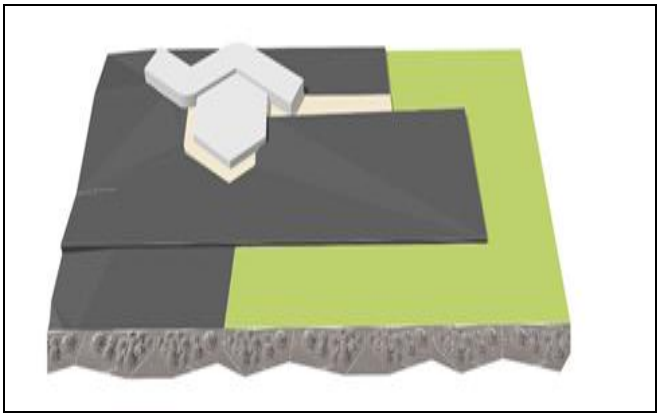

Fig 17: Construction of the Reception Area

- *Stage 2:* Resilience

This stage reflects the displaced people's adaptation and their continued participation in the setup of temporary housing sectors. (See Figure 18).

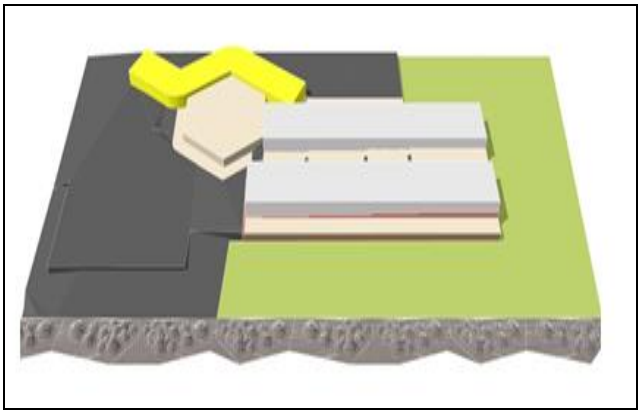

Fig 18: Installation of the Residential Area

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It involves constructing shelters under which various housing units will be distributed. Here, the project elevations are mainly tarps, covers, and cloth pagnes provided by humanitarian aid organizations. These are installed like curtains over the bamboo structure of the shelter (see Figure 19).

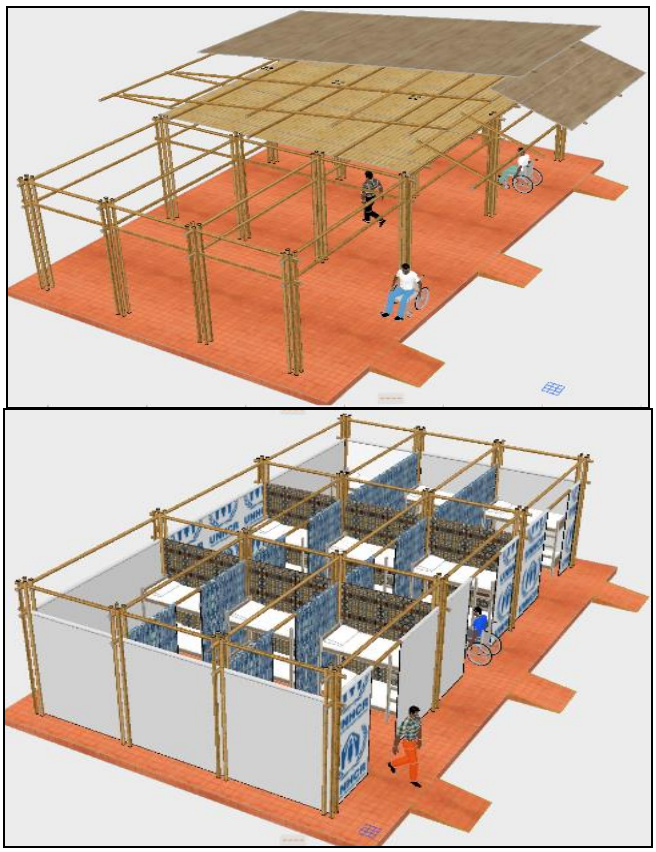

Fig 19: Construction Steps of the Emergency Shelter

Fig 20: Emergency Shelter

- *Stage 3: Maintenance 1 and 2*

This stage focuses on evolving the temporary housing units from group shelters to more solid, resistant, and intimate family modules, transitioning from tarp walls to compacted earth walls, following predefined layouts. (See Figures 21 and 22).

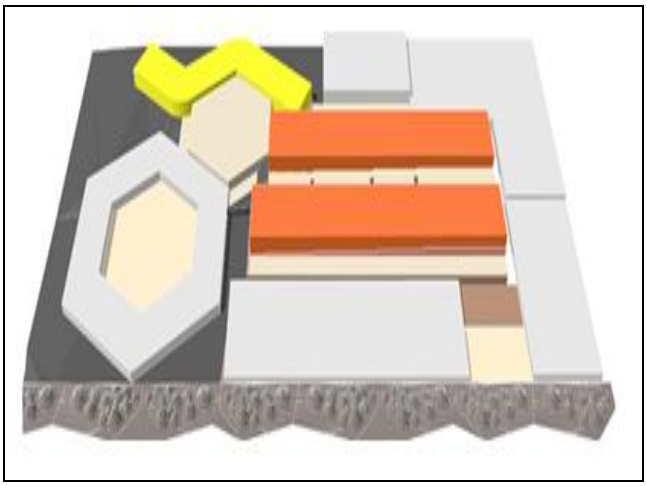

Fig 21: Installation of the Residential Area

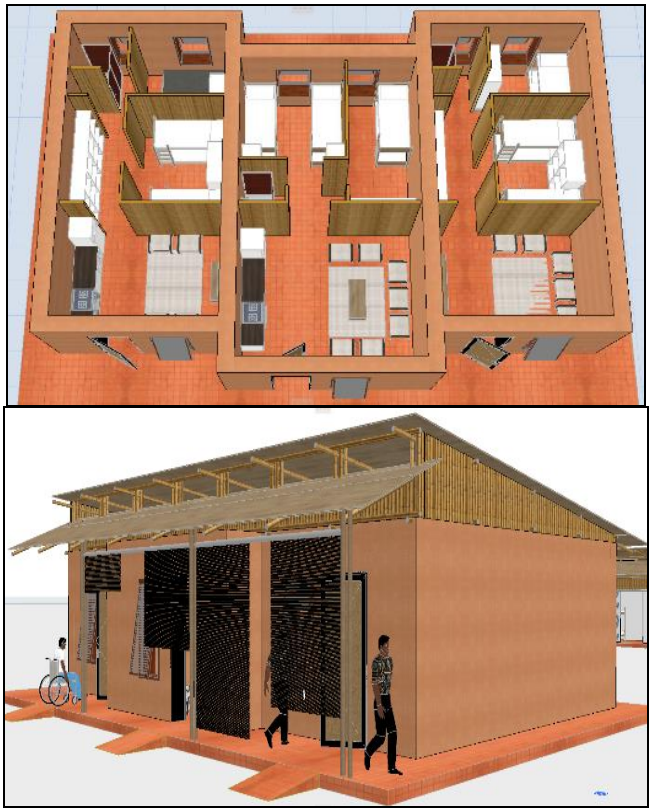

Fig 22: Final Shelterr Design

Then, educational, agricultural, and livestock zones will be constructed to ensure the reintegration and survival of displaced people (see Figure 23). Subsequently, the installation of the educational zone for teaching on economic means, means of reintegration and the upgrading of the education of the population will follow (see Figure 24).

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Fig 23: Installation of Agricultural and Poultry Zones

Fig 24: General View of the Center

➢ *Renewable Energy Production (Solar Panels)*

- Installation of Solar Panels: The center operates using photovoltaic panels for electricity generation. These solar panels serve not only to produce energy for the center but also to cover the central community space (see Figure 25).

Fig 25: Solar Panel Structure Over the Covered Courtyard

- Storage Systems: Batteries will store excess energy, housed in the storage room to ensure energy autonomy during periods of low sunlight.
- Awareness: Educational workshops will be held to inform users and visitors about the importance of renewable energy.

➢ *Optimized Water Management (Collection, Treatment, Reuse)*

- Rainwater Collection Systems: Gutters and tanks will collect rainwater for irrigation purposes and are included in the center's layout (see Figure 26).
- Wastewater Treatment: A wastewater treatment system is installed on-site, allowing its reuse for toilets or garden irrigation.
- Water Conservation Awareness: Awareness campaigns will be organized to promote responsible water consumption practices.

Fig 26: Water Collection, Storage, and Reuse System of the Projet

➢ *On-site Waste Treatment and Recycling*

- Selective Sorting Systems: Containers for sorting recyclable, compostable, and non-recyclable waste will be installed.
- Composting: Composting areas for organic waste are organized along the gardens and farming zones, reducing the amount of waste sent to the landfill (see Figure 27).

Fig 27: Composting areas of the Projet

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- Recycling Workshops: Workshops will be organized to teach users how to reuse and recycle their waste.

These measures will ensure that the Tchoualé reception center serves as a model of sustainability, accessibility, and safety, while meeting the needs of displaced people and the local community.

V. PROJECT IMPACT ASSESSMENT REPORT

This construction project has significant economic, social, environmental, and cultural impacts on the region where it is planned to be implemented. (see Figure 28).

- Economically, it will generate temporary jobs during the various construction phases and permanent positions once the center is operational. It will stimulate the local economy by purchasing materials and services, while attracting visitors who will boost surrounding businesses.
- Socially, the center will improve the quality of life for residents and the host community by providing access to various services, education, and vocational training for both displaced people and locals. It will strengthen community ties through meeting spaces, promoting better inclusion and social cohesion.
- Environmentally, the project adopts a sustainable approach by using local materials, installing solar panels for renewable energy production, and implementing rainwater collection and reuse systems, while raising ecological awareness within the community.
- Culturally, the center will serve as a platform for preserving and promoting local heritage by organizing cultural events and supporting crafts, thus reinforcing the region's cultural identity. In summary, this project is an integrated initiative addressing multiple challenges, promoting harmonious and sustainable development in Tchoualé.

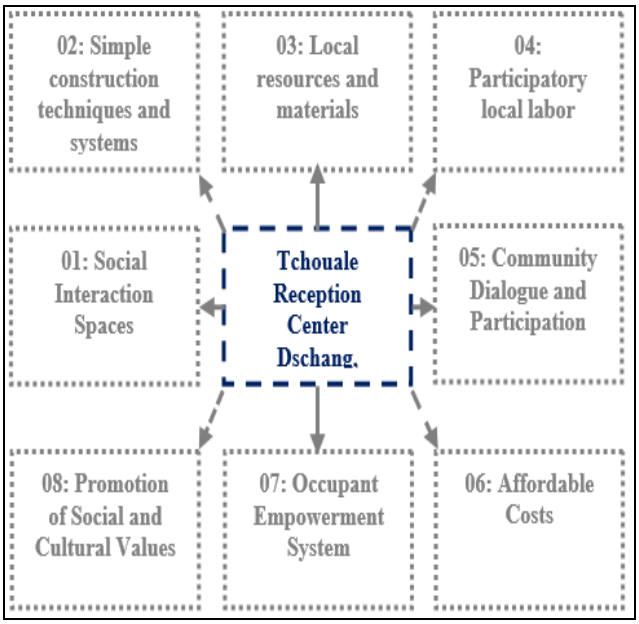

Fig 28: Strengths of the Tchoualé Reception Center

VI. CONCLUSION

In summary, this article has enabled us to present a comprehensive assessment of our Tchoualé reception center design, highlighting the essential organizational and functional arrangements of the reception spaces alongside the architectural considerations. We traced the development of the architectural solution, illustrating how it integrates sustainable, modular, adaptive, and resilient elements to effectively address the needs of displaced individuals. Our approach examined the innovative structural models that enhance the center's capacity to provide better living conditions. Ultimately, we synthesized the project's design implications and potential impacts, paving the way for ongoing discussions about its effectiveness and benefits for humanitarian housing solutions.

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