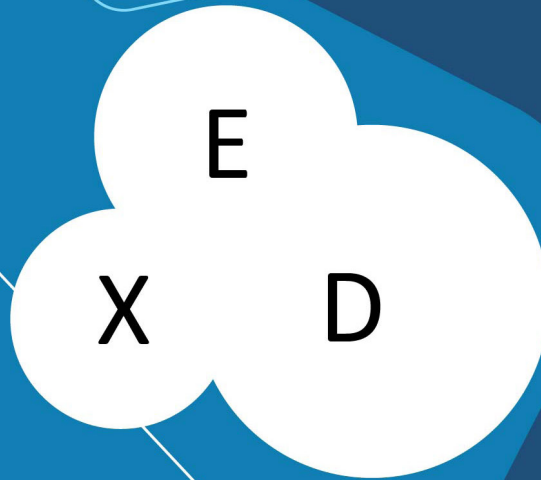




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## Adopting Passive Design Strategies to Improve Emergency Shelters in Maiduguri Nigeria

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### ABSTRACT

The Boko haram insurgency in Maiduguri that started in 2009, causing chaos and displacement of people all over the region has been challenging to the people and the government of Borno state, the insurgency has subsided to success with the help of the Nigerian government and the humanitarian aids. By early 2023, the State Government has made significant progress in closing Internally Displaced People (IDPs) camps in Maiduguri and resettling displaced individuals, the process has been quite challenging. However, the returnee's safety, well-being, and sustainable reintegration remain pressing concerns. The study aims to focus on the recovery process in rehabilitation and reconstruction of post-disaster affected areas to build back better, through methods of identifying the needs of the (IDPs) and by adopting the sustainable reconstruction framework with analysis of how it will positively impact the social, economic, and environmental development of the community. By adopting a passive design concept through Architectural design, proposing floor plans and 3D prototypes that can be constructed in the Bakassi (IDP) camp to re-establish livelihood and increase community resilience, contributing to the 2030 agenda of sustainable development goals (SDG) through developing a long-term emergency shelter design that acclimatizes to the built environment.

### INTRODUCTION

The recovery process is one of the crucial stages, especially for internally displaced people (IDPs) who are willing to integrate into society; this involves rebuilding lives, restoring livelihoods, and ensuring social cohesion. by prioritizing reconstruction (IDPs) can be transitioned from being vulnerable and reliant on external aids to becoming active and productive members of their chosen communities. The recovery, rehabilitation, and reconstruction phases are critical opportunities to build back better, including integrating disaster risk reduction into development measures. Building Back Better (BBB) is an approach to post-disaster recovery that reduces vulnerability to future disasters and builds community resilience to address physical, social, environmental, and economic vulnerabilities (UNHCR, 2014).

The reconstruction phase includes comprehensive solutions spanning all aspects of the city's institutional buildings, such as residential, educational, hospital, assembly, business, industrial, and Storage buildings. It also considers economic growth, social well-being, and environmental preservations. The sustainable reconstruction phase needs risk and vulnerability assessment and ongoing risk reduction to prepare against and recover from disasters (Sustainable Reconstruction & Recovery Framework, 2023.) For emergency shelters, rehabilitation (refurbishing a building) or reconstruction (renovating halfway damaged buildings or developing new buildings) can determine a long-term or short-term recovery.

Emergency shelters are mostly provided to protect displaced and homeless people from harsh climatic

conditions, providing space to live, store their belongings, and promote dignity and stability in times of crisis. These types of shelters can be delivered for a temporary purpose depending on the availability of space or facilities such as warehouses, schools, and abandoned buildings that do not require occupants to sign leases or occupancy agreements (Opdyke *et al.*, 2021). However, long-term emergency shelters can be developed or transformed through reconstruction. To achieve a successful reconstruction, establishing a dedicated mechanism to implement sustainable reconstruction involves identifying or forming an entity to drive reconstruction efforts on the national or local level. This entity should be focused on rebuilding, which includes setting targets, coordinating multiple stakeholders, monitoring implementation, and tracking funding and progress. Otherwise, it will be difficult or impossible to manage the complexity of this process holistically and in keeping with the end-to-end vision of the city, while ensuring that all reconstruction efforts are completed in a timely fashion.

Long-term emergency shelters can be a solution for displaced people who lose their homes due to conflict and other natural disasters, a better shelter design can be considered for them to achieve comfort and privacy and at the same time improve the sustainability of the built environment (Hendawy *et al.*, 2024) Adopting a climate change-oriented shelter design provides excellent consideration in climate change action towards minimizing the use of energy that increases the emission of air pollutants and greenhouse gases. Adopting passive designs or climate-responsive strategies is fundamental

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for buildings to achieve energy efficiency, especially for emergency shelters. However, getting optimal passive design solutions for buildings, since the passive design is related to several factors, such as the local climate and topography, building group layout, building form, building envelope, and landscape design. Passive design strategies improve interior comfort conditions by increasing the energy efficiency in buildings and reducing their energy consumption (Rodriguez-Ubinas *et al.*, 2014).

Considering passive solar techniques an emergency shelter can be designed to adaption means being ready to face adverse aspects of climate change to minimize the damage they may cause through anticipating solutions and taking appropriate actions. A home is expected to provide the residents a refuge or shelter from the climate. This is the main reason we need this feature in our homes. When the climate changes are concurrent with time, the home may not be able to resist such climatic changes and accordingly meet these needs(Ochoa & Capeluto, 2008). The study will be focused on Bakassi camp in Maiduguri Borno state Nigeria, as part of the northern hemisphere along the equator and east of the Greenwich meridian, Nigeria lies between latitude 4-14°North and longitude 3-14° East. The sunrise from the east and sets in the west. Nigeria has an essential tropical climate with two seasons and an average temperature of between 24°C and 30°C. the country is characterized by three distinct climate zones, a tropical savannah climate in the central region, a tropical monsoon climate in the south, and a Sahelian hot and semi-arid climate in the north. The northern area has a high degree of annual variation during the rainy season, which results in floods and droughts. Nigeria is part of the northern hemisphere along the equator and east of the Greenwich meridian where it lies between latitude 4-14°N and longitude 3-14° E (Gbode *et al.*, 2019).

### Aims and Objectives

This study aims to identify challenges internally displaced people (IDPs) face and propose recommendations to enhance emergency shelters. Adopting a sustainable reconstruction framework can increase community resilience and the number of houses that can accommodate homeless people, and implementing passive design strategies for emergency shelters can contribute to sustainable development.

- a. To identify the needs of the Internally Displaced People (IDPs) and to provide permanent shelters outside vulnerable areas.
- b. To adopt a proposed passive design concept (orientation, insulation, and ventilation).

### Research Question

The research will be answerable to these questions

- a. How to reduce the challenges faced by internally displaced people (IDPs)?
- b. How can emergency shelters contribute to sustainable development?

## LITERATURE REVIEW

### Disaster Relief Shelter

A Shelter has been a way of life right from the beginning of mankind where our ancestors used caves during the Stone Age as shelters that served as protection to themselves against danger and wild animals and kept them safe from harsh weather. According to the Oxford Dictionary shelter is “a place giving temporary protection from bad weather or danger”. Cambridge Dictionary defines shelter as” to protect yourself, or another person or thing, from bad weather, danger, or attack”. Having known that man cannot live without a roof above him that will protect him against all sorts of calamities either naturally or manmade it became his priority to protect himself and his family. Due to innovation and creativity, man designed his territory, now known as cities. However, shelter as the comfort zone of people was also faced with various challenges and insecurities as natural and manmade disasters such as floods, volcanoes, wildfires, earthquakes, hurricanes, tsunamis, and conflicts that destroy or damage homes, leaving people in devastating conditions as homeless displaced people (Albadra *et al.*, 2018).

The internally displaced people (IDPs) are the most vulnerable in the world as many are uprooted from their homes and livelihoods, with the fear and mourning of their loved ones who have lost their lives in the course of conflict or disasters, they often face dangerous conditions and continue to face risk even after fleeing to safety. Although they remain in their country but move as far away from the danger zones as possible, in the course of moving some may face family breakage where siblings might lose one another along the journey this may affect their emotions and put them into distress and depression (Bashawri *et al.*, 2014) It is the primary responsibility of the government to assist and protect the internally displaced people (IDPs) and bring them to safety, but this can sometimes be beyond the capacity of the government to handle. Rescue from external bodies such as the United Nations (UN) agencies has the mandate to resolve refugee problems(Wilson, 2011).

The United Nations High Commissioner for Refugees (UNHCR) is an organization supported by United Nations (UN) agencies as an international body for action to protect and resolve refugee problems worldwide. They provide life-saving assistance, shelter, food, water, and medical care for vulnerable people. They aim to listen and work with affected communities, as (IDPs) cannot provide themselves with such amenities and assistance (Mohammed, 2022). Humanitarian aid comes into play immediately to aid the community by observing the situation and delivering possible solutions. However, the quality of shelters delivered in the short-term cannot be compared to that of the long-term where some of the structures barely have foundations and reinforcements, the stability and durability of such structures are low instead wood is used as poles, tarpaulins is used as external

walls and iron zinc or the tarpaulin as roofs. This can be regarded as temporary or short-term shelters because the quality of the structure is not up to building standards (Wilson, 2011).

### Emergency Shelters

An emergency shelter is a group of housing established by public or private organizations, often charitable, to offer temporary or transitional shelter to individuals who would otherwise be without a place to sleep (Wilson, 2011). There is a transition phase that involves putting in place temporary infrastructure and short-term problem-solving, which is followed by a longer and more permanent process of rebuilding. A shelter and a house have different purposes, before a shelter becomes a house there is a transition that determines the process, and this transition key down to understanding shelter/ housing categories, having known that a shelter in disaster relief process begins as a short-term recovery and the shelters that are transitioned into long-term houses are called permanent supporting houses (Opdyke *et al.*, 2021), (Gilcrease, 2020). Hence a situation where an emergency shelter is renovated or reconstructed and transitioned into a permanent shelter is called a house. As such an emergency shelter can be described as permanent supportive housing.

### Case Description

#### Work Case (Passive Design)

Passive design works with local climate or natural elements such as sunlight, wind, and shade to create a comfortable living temperature in a home while minimizing energy consumption. An architectural approach to reducing mechanical heating or cooling and lighting relies on building orientation, site selection, building materials, insulation, and ventilation systems. Passive design is not a specific set of design rules but a collection of principles that guide Architects, engineers, and builders in creating energy-efficient and comfortable buildings. These principles are based on the use of passive solar design, natural ventilation, and thermal mass to create spaces that are warm in winter, cool in summer, and comfortable year-round (Rodriguez-Ubinas *et al.*, 2014).

#### Importance of Passive Design

Passive design is one of the solutions in achieving sustainable building against climate change as buildings also contribute to carbon gas emissions of approximately 40% that affect the ozone layer it serves as a strategy for reducing the effect of carbon dioxide (CO<sub>2</sub>) gas emitted. It also contributes to minimizing the use of fossil fuels as a source of energy for buildings, but daylight or solar panels are used as a source of power for the built environment. The passive design promotes comfortability

and a healthy environment for occupants by creating a well-ventilated space that is oriented with openings in the windward direction for thermal comfortability to improve productivity, reduce sick days, and enhance quality of life (Altan *et al.*, 2016).

### Principles of Passive Design

Passive design principles are based on the use of natural elements such as the wind, sunlight, and shade to create a comfortable living space which includes:

#### Site Orientation

This includes the site selection criteria in considering the sunrise and sunset to ensure the building is laid properly whereas in the northern hemisphere, the longer side should be facing the north-south and the shorter side should face east-west. The northern hemisphere is the north pole which lies above the equator, the continents in the north include North America, Asia, Europe, some parts of Africa, and some parts of South America. The site orientation helps in orienting the building to maximize solar gain and minimize heat loss (Altan *et al.*, 2016).

#### Building Envelope

This involves the external walls, foundations, roof, windows, and doors. In order to achieve a passive design exterior insulation and sealing of the building envelope is required to reduce heat loss and air leakage by using high-performance windows and shading devices to regulate heat gain and glare.

#### Ventilation

Providing cross ventilation by positioning the window openings across each other or adjacent to one another can provide natural indoor air quality and thermal comfort to the building (Altan *et al.*, 2016; Ochoa & Capeluto, 2008).

#### Heating and Cooling

Instead of using generators that emit excessive amounts of (CO<sub>2</sub>) gas into the atmosphere the use of passive solar design, geothermal heating, or radiant cooling is required to regulate indoor temperatures

#### Lighting

The orientation of the building helps in allowing the building to maintain efficient daylighting from sunrise and sunset reducing the need for artificial lighting and minimizing light pollution (Ochoa & Capeluto, 2008).

#### Water Efficiency

Use water-efficient fixtures. Provide pipes along the roof drainages to serve as water traps during the rainy season, reusing water and reducing consumption.

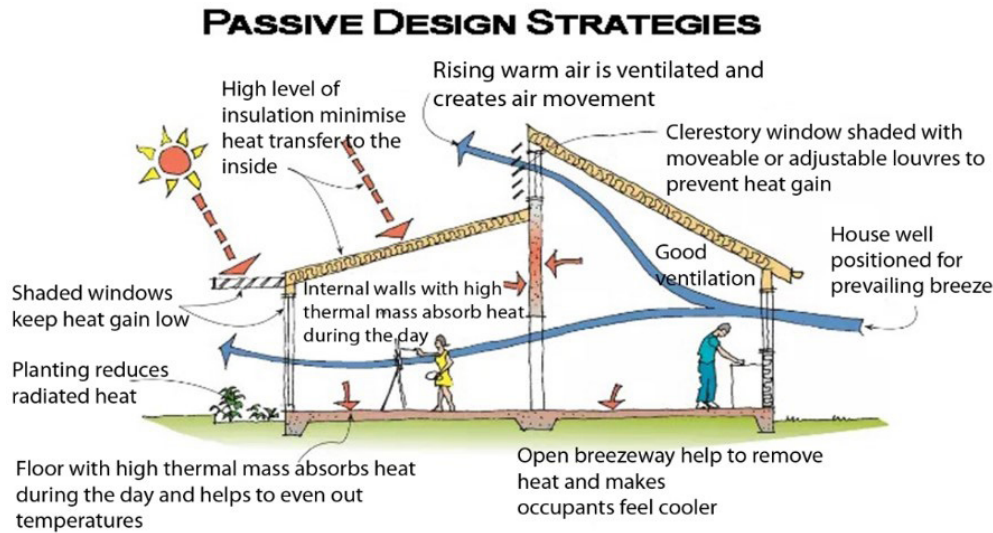


Figure 1: Diagram showing the passive design strategies source: Archi-monarch.com

**Design Preliminary**

Before executing a design project, a preliminary study is essential to ensure project feasibility needs to take place, the preliminary consists of site selection criteria that evaluate potential locations based on the site analysis (geographic, climatic, and topographical features), zoning regulations that dictate land use, and neighborhood, understanding the critical infrastructure (existing drainages system and access roads) for effective planning (Smith, 2002).

**Use Case (Bakassi IDP Camp)**

**Geography**

Borno State is situated in the northeast part of Nigeria in West Africa between latitude 10° 30' and 13° 50' north and longitude 11.00° and 13° 45' east, occupying an area of 69,435 sq km sharing border with three states, Adamawa to the south, Gombe to the southwest and Yobe to the west as well as three countries, namely, Republic of Niger, Chad and Cameroon to the north,

north-east and east respectively. The climate of Borno is the trade wind also known as harmattan that occurs during February and December windy with an average of 11 km/h, annual rainfall is between 4 to 5 months with August as the highest peak, the hottest period in May with an average of 34°C, January is the coldest with an annual average of 23°C (Nzelibe *et al.*, 2024).

Borno is one of the epicenters of the protracted crisis and hosts the majority of Nigeria's IDP communities which, after years of conflict and violence, have started rebuilding their lives yet were struck by the floods and once again displaced. Thousands of others seek safety from rising waters in overcrowded schools and camps. The state had a population of 4,171,104 in 2006 which increased to 7,498,333 in 2021 spreading across three senatorial districts that comprise nine (9) local government areas. The most dominant language is Kanuri then other ethnic groups are Babur, Bura, Lapang Mandara, Marghi, and Shuwa Arabs among others (Kamta *et al.*, 2020).

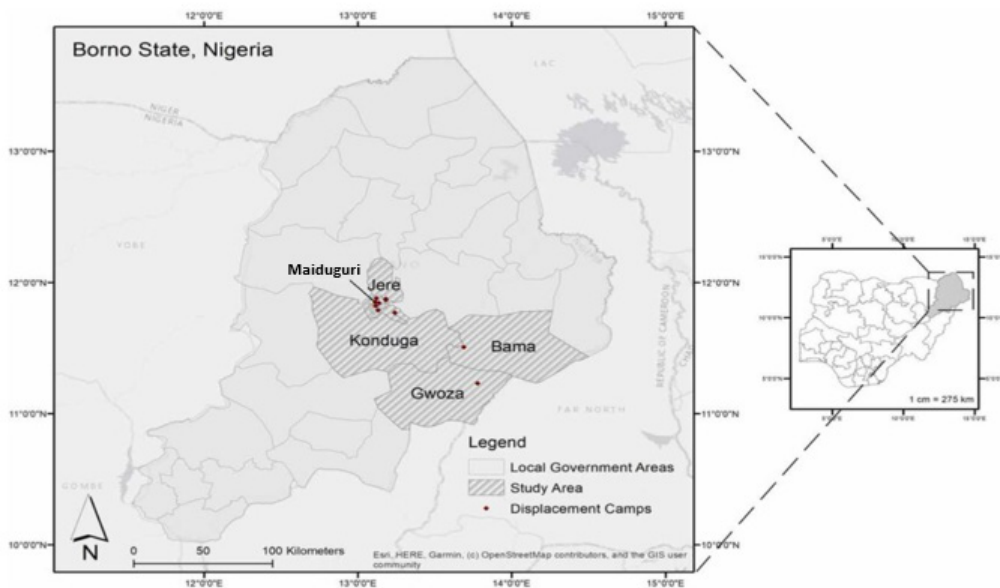
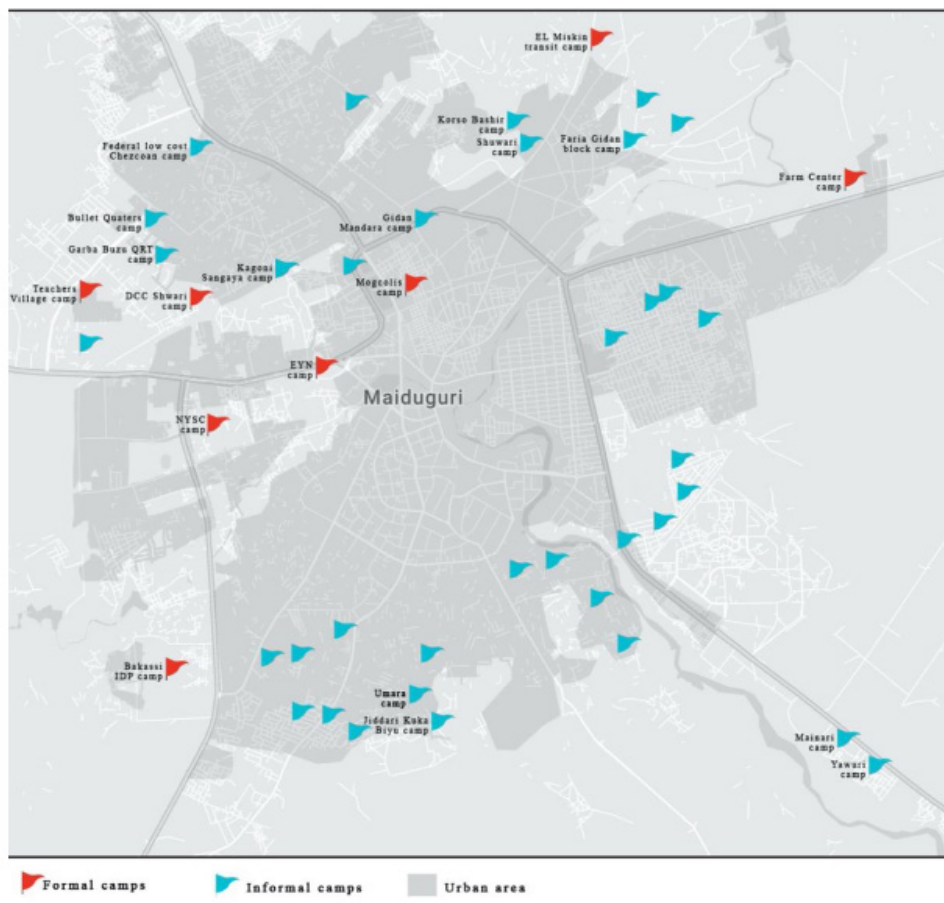


Figure 2: Map of Nigeria showing the location and area of the use case (Mohammed, 2022)

**IDPs in Borno State**

Before the deployment of the (IDP) camps, the first responders were the hosting communities, where they provided IDPs vital assistance and support, the (IDPs) fled to communities between 2013 and the beginning of 2014. The hosting communities took forms where the in-hosting community accepted the IDPs within families and shared the same space such as a room or outbuildings attached to their homes (same property). In the other form, the distance hosting communities do not share the same space with their homes instead, numerous collective families provide owned properties such as houses and lands for them to stay. However, the host communities also faced some challenges of economic instability (Mohammed, 2022),(Kamta & Scheffran, 2022). The Borno State Urban Planning and Development Board (BSUPDB) involves planning regulations and enforcing urban development codes in the city that generally lead the design and establishment of camps settlements. They also participate in the influence distribution of self-settled (IDPs) in host communities to have control in communities that are deteriorating into slums by working together with the development

partners and the international organizations or camp authorities. (Mohammed, 2022) As camps emerged in the open spaces a lot of schools were occupied by the (IDPs) which led to their closure, and instead use other open spaces in place of schools, the institutions have been suffering from this insurgency where it is due to a lack of proper provision for shelter as such the (IDPs) in proper camps gets proper supports over the host communities. (BSUPDB representative, 2019). The (IDPs) sole provider of new tents/ shelters is the (UNHCR), they provide numerous amounts of tents made from poles and tarpaulin. In the Bakassi camp, they accommodated over 30,000 IDPs and deployed other (UNHCR) tents in the open fields where the IDPs are sheltered such as the schools that serve as a formal camp, (Mohammed, 2022) the classes have been demarcated into rooms. The (UNHCR) representatives admit to the difficult situation of the school camping as a serious issue for education needs to be the priority of everyone most especially for the (IDP) children. The state government also provided some uncompleted houses of about 200 estates to host the (IDPs).



**Figure 3:** Map showing (IDPs) camp in Maiduguri (Mohammed, 2022).

**Bakassi Camp**

In January 2015 the camp was officially opened by Borno State Government, the camp is one of the oldest camps in Maiduguri. It is located in the Bakassi Housing estate,

originally built as part of the Borno State housing project. The security situation in the camp is relatively stable with the site secured by the military, police, immigration services, and the Civilian Joint Task Force (CJTF). The

camp has however previously suffered several attempted and successful attacks. two suicide bombers infiltrated the camp on 29th October 2016, killing 9 IDPs and injuring several. On 30th October 2016, another suicide attempt was uncovered by the security forces. Ever since it has been protected and peaceful. (OCHA, 2020). The Bakassi camp is the largest and one of the oldest camps in the region. It hosted approximately 39,000 IDPs in 2019, it is one of the closest to the rural areas of Maiduguri, Nigeria. The Nigerian government set it up to accommodate (IDPs) most of the camp occupants are from Guzamala, Gwoza, Marte, Monguno, and Nganzai, from northeast, and southeast of Maiduguri, close to the border with Cameroon, those occupants are largely affected by the Boko haram crisis. Among (LGAs) whose members were present in the camp, Marte was the largest

with 13,600 members, followed by Gwoza with 12,000 members, Monguno with 9700 members, Guzamala with 3000 members, and Nganzai with 750 members. organizations in Abuja the Federal capital territory (FCT) including the Institute of Peace and Conflict Resolution, The National Commission for Refugees, Migrants and Internally Displaced Persons (NCFRMI), the Federal Ministry of Environment, the Federal Ministry of Water Resources, the Federal Ministry of Labor, the International Committee of the Red Cross (ICRC), the United Nations High Commission for Refugees (UNHCR), The National Emergency Management Agency (NEMA), and the M.O.B foundation (an NGO assisting IDPs) were part of the assistance team that ensures support and assistance are done to the communities (Kamta *et al.*, 2020).

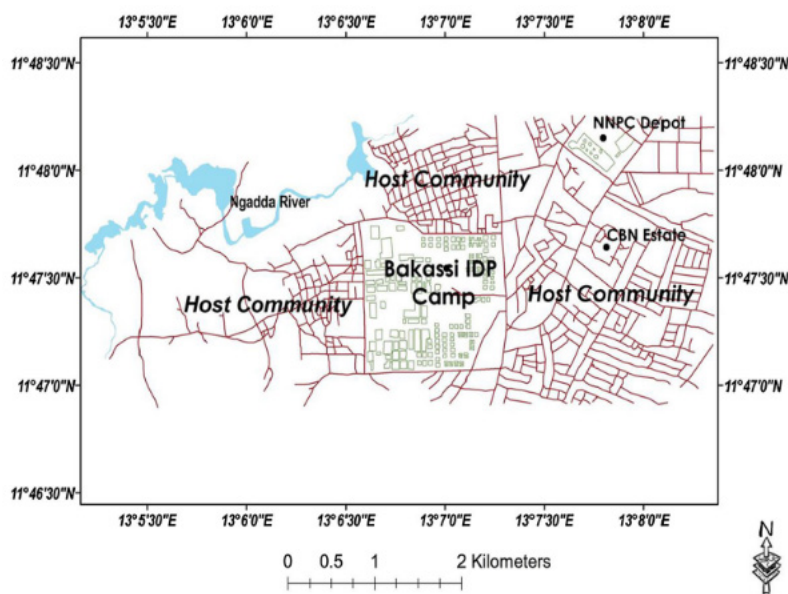


Figure 4: Map showing Bakassi camp and its neighboring communities (Mohammed, 2022)

**Challenges Faced by the (IDPs)**

The traumatization of the insurgency that affects the mental health of some (IDPs) the widows and teenagers feel like they do not have much else left in their Local Government Areas (LGAs) many are likely going to end up settling in their location of displacement where they have access to education, food security, and job opportunities, they may be better where they currently are.

According to (Mohammed, 2022) there are reported cases of Gender-Based Violence GBV which is a crucial aspect of protection for women and girls, particularly in 2016 when there was a huge influx of (IDPs) the camp management and security that was supposed to protect them are once exploiting them, also blamed that the nature of the camp contributes to gender violence, it was elaborated that with thousands of shelters in the camp the toilets are positioned at the extreme ends of the camp in some camps the toilets are built outside the camp (attached to the wall of the camp from the outside) where it is difficult for the women to go there at night and sometimes can't differentiate between the male

and female toilets (Mohammed, 2022). Another factor that results in the GBV is the collection of firewood, lack of income opportunities, and early marriage either for economic gain, to reduce a family's burden, or to serve as a protective barrier to the women and girls in a humanitarian setting.

The host communities carrying the burden of the (IDPs) is tiring where the government of Borno State has ruled that only (IDPs) in formal camps can get support from the government and major international organizations, yet when the (IDPs) try to access the camps they were told to go somewhere due to the full capacity of the camp (Mohammed, 2022).

**IDP Intention Survey**

According to the Displacement Tracking Matrix (DTM), a survey conducted that the (IDPs) intentions were categorized into three where intended return categories (67%) of respondents in both camps, camp-like settings, and in the host communities intend to return to their locations of origin. although, (59%) of respondents who

intended to return to their locations of origin stated that their houses were destroyed and needed re-building. The second category which is intended to integrate (11%) of respondents in Borno State indicated that they did not intend

to leave the locations where they are currently displaced in the coming months, instead, they plan to integrate into the host communities and stay, they mentioned the reason for their decision was that the security situation in their current

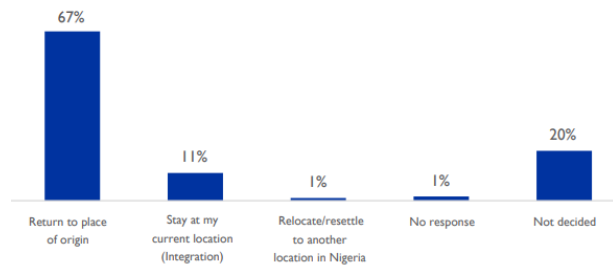


Figure 5: IDP Intention Survey.

place of displacement is good. The third category is the intended relocation Only one percent (1%) of respondents planned to relocate to other Local Government Area (LGA) or states. was where their reason for the decision to relocate was to search for livelihood and income (Displacement

Tracking Matrix, 2024).

By early 2023, the State Government had made significant progress in closing some of the Internally Displaced People (IDPs) camps in Maiduguri and resettling displaced individuals. As the lack of access to basic services at the



Figure 6: Statistical analysis showing the reason for no return (IOM, 2024).

camp displacement area was their major issue, they were given the opportunity to earn a living and restart life at their place of origin and search for a livelihood in their place of origin(The New Humanitarian, 2024).

The statistical survey made by the International Organization for Migration (IOM) was based on future insights about settlement aspirations, the intention

information was collected from the (IDPs) residences. The desire to return to their place of origin was high about 95% of them have a deep connection to their homes despite the long stay in the camp but still consider to return to their home communities, although 2% of them showed interest in integrating with their new surrounding communities and 3% show the willingness



Figure 7: Statistical analysis showing the reason for return (DTM, 2024).

to relocate to other parts of the country. These statistics made recovery responses strongly emphasize rebuilding in their familiar environments. However, the 2% also are certain numbers that need to be considered as their population is reasonable and is not beyond the capacity to handle (Displacement Tracking Matrix, 2024).

**MATERIALS AND METHOD**

**Methodology**

This research employs a mixed approach of qualitative and quantitative methods in analyzing the (IDPs) intentions through a statistical survey made by the (IOM) analysis where the three categories help in identifying the percentage of interested IDPs that are willing to integrate into the community and their reasons which

gives the certain reason for reconstruction, By adopting the sustainable reconstruction framework the three pillars (figure 8.) provide the research a guideline in developing the risk formula to solve the IDPs problem and identifying their needs. Developing the three sectors of social, economic, and environmental development in the framework (figure 9.) helps in defining the need of the IDPs and the importance of sustainable reconstruction by adopting passive design strategies to achieve the 2030 agenda of the sustainable development goal (SDG) the design prototype considers orientation, insulation, and ventilation.

**Data Collection**

Data were collected through site visits to Google Scholar, Research Gate, Science Direct and other Google search



Figure 8: The three pillars that the sustainable reconstruction framework (SRF) depends on.

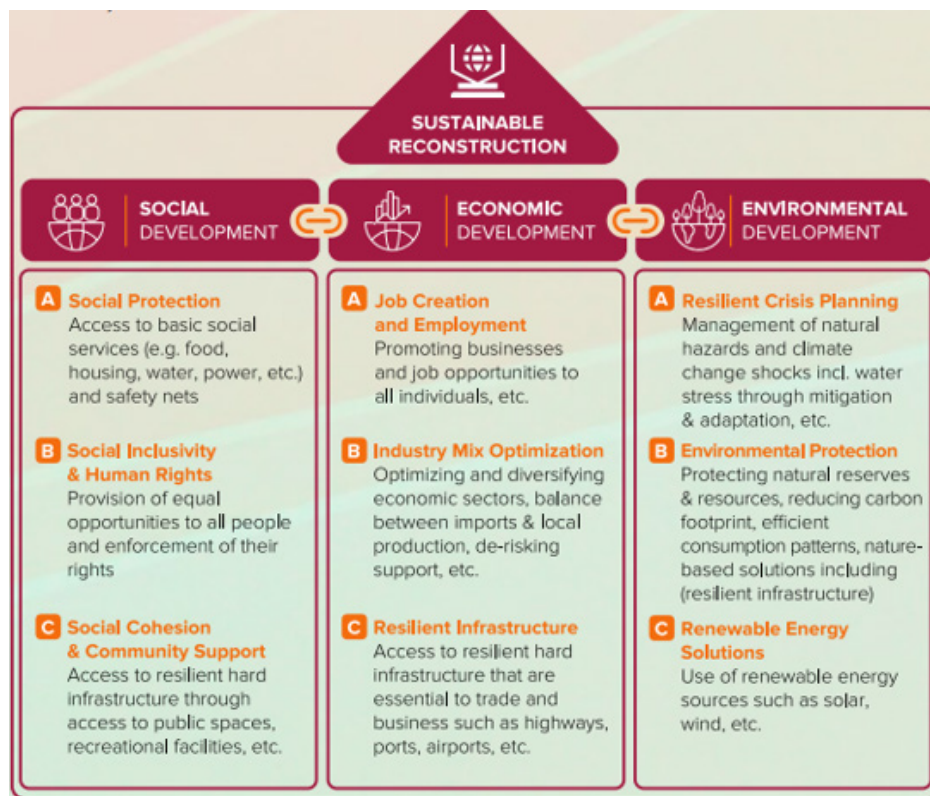


Figure 9: Showing the Sustainable Reconstruction Framework (UNDP, 2023).

articles where English is the default language to specify using ARE, OR, NOT by putting in the keywords and related synonyms to capture the area of concentration, by customizing the year range 2009 to 2024 to track articles from the beginning of the Boko haram crisis and to collect broader information, Article type were research articles, reports and relevant books by typing in the keywords and related words to capture focus and ensure in adding “Architectural journals” for the architecture aspects and “scientific journal” to be precise.

**RESULTS AND DISCUSSIONS**

This analysis was adopted from the sustainable

reconstruction framework (SRF) (UNDP, 2023) for inclusive planning and financing to support green transition in the Arab Emirates region. framework for sustainable reconstruction rests on three key pillars (figure 8.) that promote development and the achievement of the 2030 Agenda and the SDGs.

These three pillars are linked to social, economic, and environmental development, interconnected, and influenced by each other. By adopting this framework, we should ensure that this case is suitable for reconstruction. To achieve these pillars, there is a need to identify the risks faced by the Bakassi (IDPs) where the factors

**Table 1:** Risk analysis

Risk	Consequences	Vulnerabilities
Mental health	<ul style="list-style-type: none"> <li>● Traumatization from the crisis insurgency.</li> <li>● Financial instability.</li> <li>● Lack of job/employment.</li> </ul>	Widows, widowers, and teenagers
Gender Base Violence (GBV)	<ul style="list-style-type: none"> <li>● Positions of toilets at the extreme ends of the camp.</li> <li>● Security is taking advantage of girls to gain access to water.</li> <li>● Lack of income leads to sexual assault.</li> </ul>	Girls and women
Education	<ul style="list-style-type: none"> <li>● Single parents with many children lack access to education.</li> </ul>	Children and teenagers

considered in this exercise were behavioral, psychological, environmental, and social factors as seen in (table 1.) identification of the consequences and vulnerabilities were obtained where the formula is.

Risk = consequence \* vulnerability.

In this case, the understanding of emergency response

shelter design is adaptable and can be developed through determination based on the needs of (IDPs). From the risk identified, the community needs were analyzed as seen in (table 2.) where the need defines the purpose of reconstruction.

Table 3. explains the development of this case and was guided by the sustainable reconstruction framework (SRF) adopted. the social, economic, and environmental development explain the importance of reconstruction in each development connected to livelihood, mitigation, and sustainability. The developments give a clear overview of how the project will be effective in the three aspects. From this analysis, the needs define the reconstruction and the reconstruction will be described as a healing factor not only to the IDPs but to the society at large, in restoring function through construction to promote stability, progress, and resilience. The proposed site that

**Table 2:** Analysis result showing the community needs

Community needs
<ul style="list-style-type: none"> <li>● Access to food, and water.</li> <li>● Structural modification to improve privacy.</li> <li>● Access to child and adult education.</li> <li>● Access to job and employment.</li> <li>● Community co-existence.</li> <li>● Security.</li> <li>● Access to health.</li> <li>● Sense of responsibility.</li> </ul>

**Table 3:** Analysis results that give purpose for reconstruction

1. Social Development	
Social protection	<ul style="list-style-type: none"> <li>● The site is located at the municipal level of Maiduguri City, where security exists.</li> <li>● The site is accessible to roads, water, food, and electricity.</li> <li>● There is an already existing humanitarian Action Against Hunger International within the site that can help in monitoring and saving the lives of malnourished children and their families.</li> <li>● The opportunity to gain access to education and mobile networks.</li> </ul>
Social inclusivity and human rights	<ul style="list-style-type: none"> <li>● The opportunity to co-exist with the community will decrease the trauma of mental health of the IDPs.</li> <li>● The inclusion of toilets for each family serves the purpose of privacy and hygiene.</li> <li>● The opportunity to be part of the community.</li> </ul>
Social cohesion and community support	<ul style="list-style-type: none"> <li>● The social bonding across communities through public space is considered by creating children’s playgrounds on the site.</li> <li>● The proposed mini-clinic will also serve as a community development.</li> <li>● The engagement of children going to school for education.</li> </ul>

<b>2. Economic Development</b>	
Job creation and employment	<ul style="list-style-type: none"> <li>• The neighborhoods can give the IDPs opportunities for employment.</li> <li>• The skilled among the IDPs can engage in entrepreneurial work and sell their products to the communities.</li> <li>• The participation of the community and the IDPs in the construction site.</li> </ul>
Industry mix optimization	<ul style="list-style-type: none"> <li>• Order supplies and materials within the municipality.</li> <li>• Utilization of accessible materials.</li> </ul>
<b>3. Environmental Development</b>	
Resilience	<ul style="list-style-type: none"> <li>• Developing a structure that can accommodate homeless people.</li> <li>• Using building materials that can withstand flood and harsh weather.</li> </ul>
Renewable energy solution	<ul style="list-style-type: none"> <li>• The use of natural daylight, and natural ventilation in the daytime to improve energy efficiency.</li> </ul>

will be suitable for this project will be the Bakassi camp as the nature of this area is already an existing dominating area for the IDPs for the 11% of the IDPs that are ready for integration bringing them together in this location can help in covering their needs.

**Planning**

The proposed site is feasible in accordance with preliminary studies due to the existence of structures, the land is relatively flat, and the site comprises of existing Bakassi housing estate, existing relief shelters, an access road, neighboring host communities, and highly military security post.



Figure 10: Bakassi camp, site plan.

The arrangements of the buildings will be in accordance with the passive design strategies, planting of trees at a certain distance, putting units like the children’s playground, access roads, an education unit, and a mini

clinic.

**Proposed Design (prototype)**

**Floor Plan**

Ground floor plan of a semi-detached one-bedroom flat.

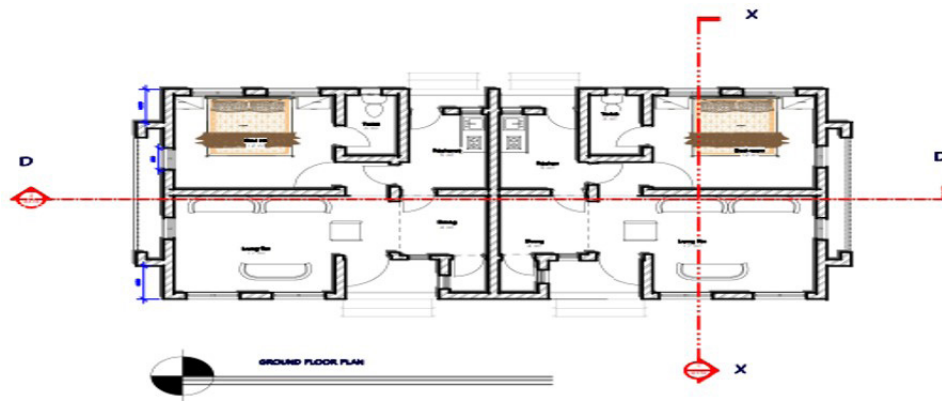


Figure 11: Ground Floor plan by author

- Single entrance and exit.
- A living room and dining area with a guest toilet.
- A bedroom and toilet in-suit.
- A kitchen outdoor.

**Roof Plan (Gable roof)**

- Roof slope @ 50°
- Pu roofing sheet with reflective colour.
- 150 x 50mm black afara hardwood rafters at 1200c/c.

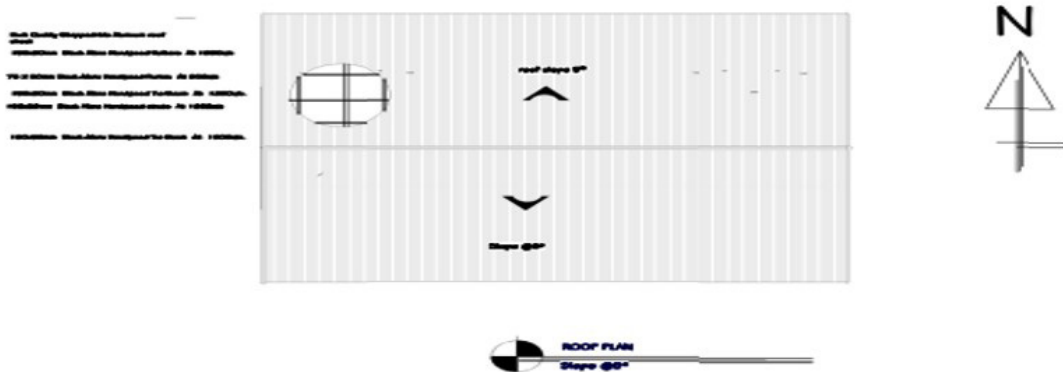


Figure 12: Roof plan by author

- 75 x 50mm black afara hardwood purlins at 900c/c.
- 150 x 50mm black afara hardwood tie beam at 1200 c/c.
- 150 x 50mm black afara hardwood struts at 1200 c/c.

**Elevation Perspective (Approach view)**

- Facing south with door and window openings.

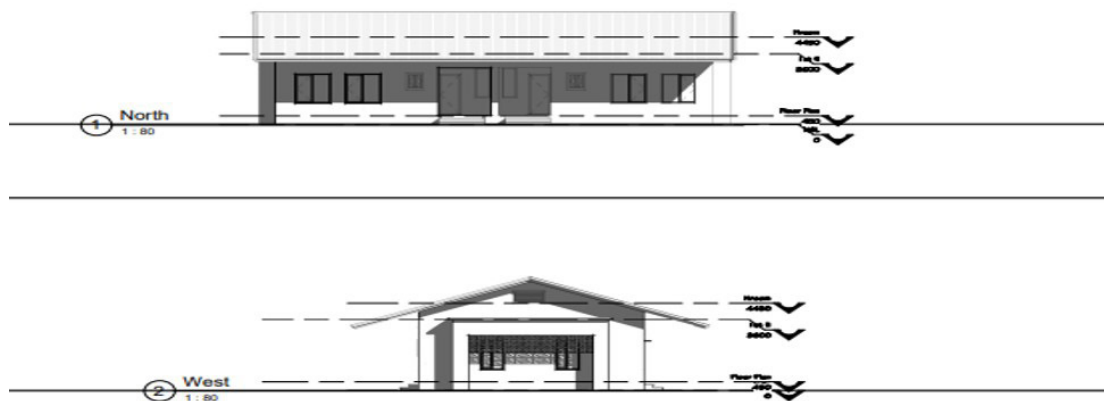


Figure 13: Elevation perspective by author

- Entrance level 450 step up.
- Right side elevation facing east with window openings and shading device.

**Elevation perspective (Rearview)**

- Facing north with door and window openings.

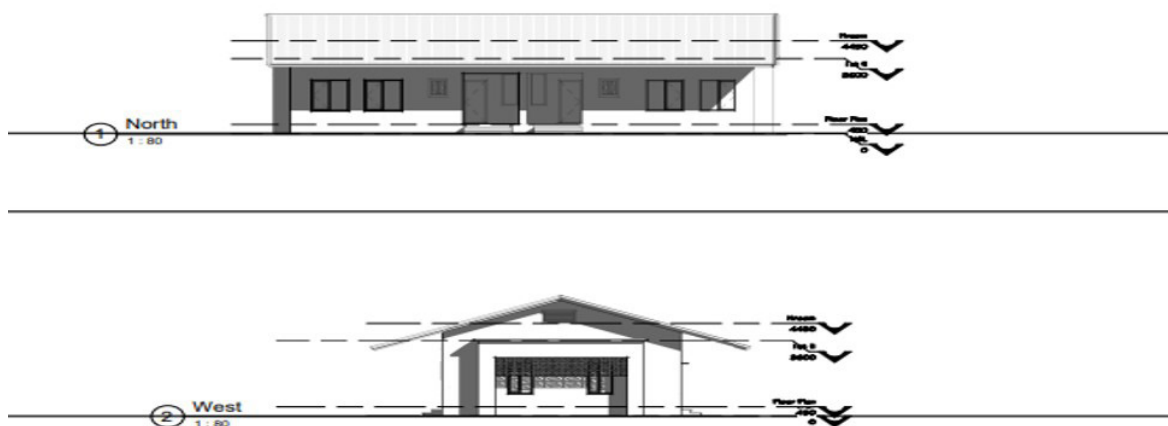


Figure 14: Elevation perspective by author

- Exit door level 450 step up.
- Left side elevation facing west with window openings and shading device.

**Section 1 (X-X) and (D-D)**

- -350mm well-compacted hardcore on consolidated

laterite earth filling.

- -450mm at welted joints laid on blind.
- 1 layer of 0.26mm polythene DPM and DPC lapped.
- -32mm sand cement floor screed on -150mm reinforced concrete floor slab.

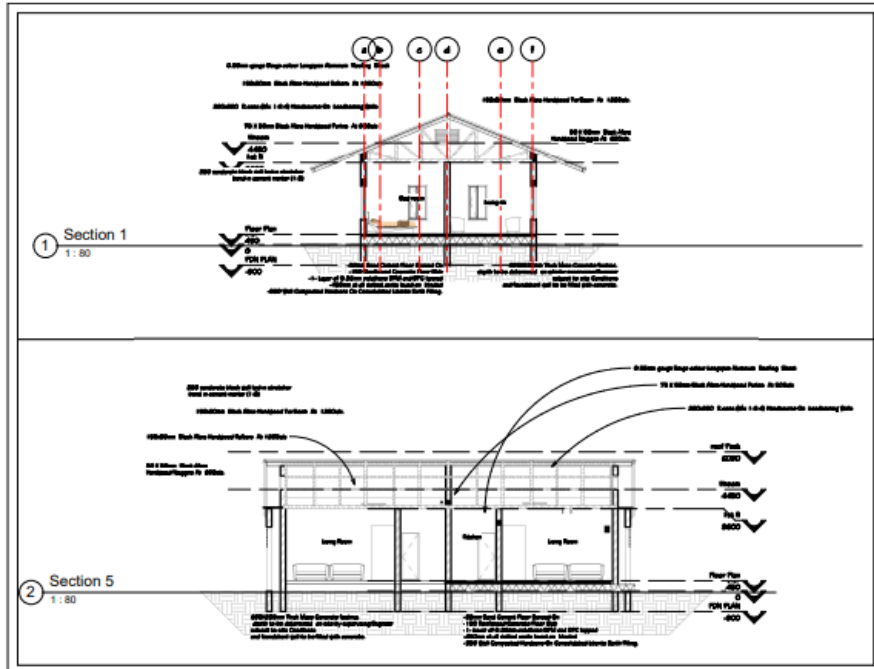


Figure 15: Section (X-X) and (D-D) by author

- 690 × 230mm thick mass concrete footing, depth to be determined on-site by supervising engineer subject to site conditions and foundation wall to be filled with concrete.

**Prototype 3D Perspective**

According to the United Nations Office for the Coordination of Humanitarian Affairs (OCHA), the total

number of IDPs in Bakassi camp is 30,327, of which 15,009 are children, 6,280 are women, 5,138 are men, 2,729 are infants, and 1,172 are elderly. The maximum capacity of individuals that can occupy the camp is 48,238 (OCHA, 2024) This number can be used to identify the future capacity of individuals who can occupy the space



Figure 15: 3D Perspective by author

after construction.

### Recommendation

This holistic approach for reconstruction to the 11% (of IDPs) can be a powerful tool in enabling the integration of willing (IDPs) to integrate into society, by fulfilling their needs by providing housing, education, economic opportunities, and social services as well as fostering peace, understanding, and resilience in their new communities.

Internal displacement continues to be Nigeria's primary humanitarian concern with over 2.3 million people currently living in displacement situations. This includes internally displaced persons, returnees (former IDPs) and refugees. The adoption of these action plans marks a significant milestone in advancing efforts to empower displaced persons to rebuild their lives sustainably, focusing on durable housing, sustainable livelihoods, and social cohesion (IOM, 2024) IOM reaffirms its unwavering support to the Government of Nigeria and local authorities in implementing the relocation, integration and return action plans to stand ready and provide technical expertise, resources, and assistance to ensure their effective implementation.

To achieve the 2030 agenda of sustainable development goals (SDGs), Adopting a passive design concept in reconstruction helps to reduce energy consumption, utility costs, carbon footprint, efficient use of natural resources, and indoor comfort through regulations to maintain indoor temperature and improve air quality. Passive-design buildings are resilient to energy dependency and adaptable to climates. Infrastructure development is a cornerstone of economic growth, poverty reduction, environmental sustainability, technological advancement, social integration, and national security. Developing an emergency passive design is not just building a physical structure but creating a system that supports sustainable growth and improves the quality of life for all citizens.

### CONCLUSION

The development of residential support project by the government for the community as it addresses a variety of social, economic, and infrastructural needs highlights the importance of improving living standards, economic benefit (creating construction jobs and supporting local businesses), social inclusions (integrating marginalized groups into the community and supports vulnerable populations, including low-income families, elderly individuals, and persons with disabilities), health and well-being (Improves access to clean water, sanitation, and other essential services, leading to better public health outcomes), Educational and development opportunities (Ensures children have a stable home environment and can gain access to nearby schools, libraries, and community centers), crime reduction (creating sense of community ownership and responsibility), sustainability (Encourages the use of sustainable materials and energy-efficient designs in construction) and urban development (reduce slumps and promote planned urbanization).

Through development, this project demonstrates the government's commitment to addressing critical social issues and enhancing public trust and support to create a foundation for a more equal and sustainable society.

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