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Sustainable Housing Development In Nigeria: Prospects And Challenges

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***Abstract*—The goal of Sustainable Housing Development (SHD) initiative as contained in Goal 11 of The United Nations (UN) 2030 Agenda for Sustainable Development is "increased access to sufficient, safe and low-cost housing for the world's poorest people residing in slums by the year 2030". Nigeria currently the most populous nation in Africa has the record of fastest urbanizing as well the largest economy. However, pressures due to exponential population growth, massive rural-urban migration and usage of inappropriate housing development technology, have created huge cases of slums and squatter settlements in the cities. The effect is the current 17million housing deficit confronting the nation. The SHD initiative was therefore a welcome panacea to alleviating the myriad challenges hindering development in a nation like Nigeria. Till date, there are no known studies evaluating the effects of the initiative on the socioeconomic growth in Nigeria. Consequently, this paper employed the Sociotechnical Innovation Systems (SIS) approach to examine the prospects and challenges of SHD initiative on Nigeria Socioeconomic Development. Findings revealed that the success of design, development, and implementation of the actions and plans of SHD initiative, significantly depends on key Stakeholders, laws and policy regulations, and access to adequate finance. The study identified the Federal Government and Nigerian citizens as major stakeholders with the Land Use Act of (1978) as being most significant factor hindering SHD performance. Other challenges of SHD are housing affordability, lack of coherent policy framework and poor state of R&D in the country. In spite of these challenges, the prospects of SHD are considered high as evidenced by Government's interest in using the construction industry, anchored on Alternative Building Technologies (ABT), to diversify the Nigerian economy for improved living standard.**

Keywords: Strategic Planning, Sustainable Housing, Development, Alternative Building Technologies, Nigeria.

1. INTRODUCTION

The term sustainable development was first proposed by the *Bruntland* Commission in the eminent draft paper, "Our Common Future" also known as the "*Bruntland* Report" 1987. The *Bruntland* Commission (formerly called World Commission on Environment and Development, WCED) was the first organisation tasked steering the world towards socioeconomic growth and sustainable development. The report defines sustainable development as a development that meets the needs of present generations without jeopardising the capacity of future generations to meet their [1-3].

Exponential population growth, massive rural-urban migration, grinding poverty, and unprecedented and uncoordinated increase of resource consumption over the years triggered climate change around the globe, resulting in myriad socioeconomic and environmental challenges threatening mankind and its future generations. The situation is however more critical in many cities of the less developed countries (LDCs) of Sub-Sahara Africa, Asia, and South America [2-3]. In view of this, the United Nations and over 190 signatory nations ratified the motion to establish the Sustainable Development Goals (SDGs) at the United Nations Conference on Sustainable Development (Rio+20) in 2012. The main objective was to develop and adopt comprehensively applicable goals for ensuring the sustainable social, environmental and economic development around the globe by 2030 [4].

Consequently, the United Nations and world leaders at Sustainable Development Summit on 25 September 2015 voted to adopt the 2030 Agenda for Sustainable Development. The adoption paved way for the establishment of 17 Sustainable Development Goals (SDGs) aimed at eradicating poverty, fighting inequality and injustice, and tackling global climate change by the 2030 [5, 6]. Figure 1 presents an illustration of the 17 Sustainable Development Goals (SDGs).

Figure 1: Sustainable Development Goals (SDGs) [5].

With the ratification of the SDGs, the United Nations and signatory nations aim to address the major challenges such as poverty, food, health, illiteracy, gender equality, energy crises, homelessness, disease, land degradation and the effects of climate change particularly in developing countries like Nigeria.

Nigeria is the largest, culturally diverse and most populous nation in Sub-Saharan Africa with a rapidly growing population of 170 million inhabitants [7]. Despite its vast human capital, natural resources and economic potential, Nigeria remains a behemoth nation plagued by numerous socioeconomic, environmental and developmental challenges [8]. The most notable challenges are endemic poverty, poor housing, land degradation, poor health, water and sanitation, in addition to lack of modern energy services [9-11].

Interestingly, Goal 11 of the Sustainable Development Goals (SDGs) aims to make cities, particularly in developing countries like Nigeria, safer, resilient and sustainable. As part of its objects, Goal 11 aims to increase access to sufficient, safe and low-cost housing for the world's poorest people residing in slums by the year 2030. In addition, the charter seeks to increase access to cheap, accessible and sustainable public transport systems to improve road safety for women, children and the less privileged in the society. Same Goal 11 also, aims to stimulate global policy debates on the integrated planning and sustainable management of human settlements aimed at upgrading basic services in slums and shanty towns around the world.

With respect to cities, Goal 11 seeks to decrease the adverse per capita environmental impact of city dwellers and their activities on the environment through air quality, municipal and waste management. In addition, the goal envisages creating policy structures that support socioeconomic and environmental connections between urban and rural areas in a bid to manage the impacts of migration between both societies. Based on *Sendai* Framework for Disaster Risk Reduction 2015-2030, the goal also proposes to geometrically increase the number of global cities with integrated policies on resources management, disaster response and climate change mitigation. Lastly, the goal seeks to emphasize the need to support developing countries through financial and technical assistance in building affordable, resilient, and sustainable houses using alternative building technologies [4, 5, 12].

Based on the twin concepts of needs and limitations, this paper seeks to evaluate the problems of sustainable housing development (SHD) and provision as well as its role in the socioeconomic growth and development in Nigeria. The paper will access the challenges of sustainable housing development (SHD) and provision through a Sociotechnical Innovation Systems (SIS) approach. The dynamics of SIS comprises classifying, evaluating and highlighting sociotechnical challenges based on the activities of key stakeholders, national laws and policies, long term goals, and financial structures. Furthermore, the concept of needs typically aims to prioritise the basic essential needs of the world's poor whereas the concept of limitation evaluates the feasibility of addressing these needs. In

addition, the concept of limitation considers the state of socio-technological advancement and environmental conditions required for achieving the needs of humanity [13].

2. SUSTAINABLE HOUSING DEVELOPMENT - OVERVIEW

The concept of sustainable housing is synonymous with the sustainable growth and development of cities around the globe. Sustainable housing development (SHD) can be defined as the development and implementation of policies, programmes or initiatives designed to deliver safe, viable and affordable houses for individuals within a society. The concept typically adopts the tenets of sustainable social, economic and environmental factors in delivering national housing plans and policies for masses with minimal impacts on future generations and the environment [14, 15]. Typically the ideals of SHD encompasses various multi-disciplines such as urban regional planning, construction management [16, 17], sustainable building materials and waste valorization [18-20], green buildings and smart grids [21-23], as well as sustainable energy technologies [24-26]. In addition, SHD involves all the processes, systems and stakeholders involve in the planning, construction and management of cities around the world [27, 28].

Cities are melting pots for the generation of innovative ideas, diverse cultures, scientific discoveries which enable its inhabitants advance socioeconomically and geopolitically [29]. However, the concept of safe, resilient and sustainable cities advocated by SDGs Goal 11 is plagued by unending congestion, dilapidated or lack of social infrastructure, and housing deficit; quantitatively and qualitatively. Furthermore, the outlined social issues are aggravated by the fact that cities around the globe are now occupied by more than half or 3.5 billion people [5, 12, 30]. This will be further exacerbated by predictions that 60% of the world's population will reside in urban areas by the year 2030. These demographics indicate that urban expansion will soar by almost 90% increasing further the pressure on social infrastructure, utility services and housing [12, 31]. In addition, the rapid rate of urbanization has also affected water supplies, sewage disposal, the living environment, and public health in cities around the world [32-34]. The soaring growth of cities in developing nations as well as high rural-urban migration has also spurred the creation of megacities with over 450 million inhabitants. Currently, urban spaces around the world which account for only 3% of land, however account for nearly 70% and 75% of energy consumption and global carbon emissions, respectively [4, 12]. This scenario is unsustainable especially against the backdrop of growing rate of slums and shanty towns which by UN estimates already houses over 800 million people.

Therefore, the need for sustainable housing development is now imperative particularly in the developing countries. Furthermore, it is vital for mankind to urgently address the prevalence of unsustainable housing and living environments particularly due to its challenges to health, water, sanitation, national security and clement climate. Consequently, the creation of sustainable cities requires the provision of safe, affordable and resilient housing comprising modern water, waste disposal and modern energy services. According to analysts, successful sustainable housing development often requires public-private partnerships [35] with long term planning and strategic investments in public transportation, basic health care, telecommunications along with green urban spaces [12].

In congnisance of this, the UN has advocated the global adoption of Goal 11 targets as a holistic approach to housing provision for viable progress across the multiple goals that encompass the 2030 Agenda for Sustainable Development. It stands to reason that the attainment of sustainable housing development is a benchmark for socioeconomic growth and development strategic to the future developing countries around the world. Consequently, the subsequent sections of the paper will now seek to identify and highlight the current status, challenges and prospects of SHD in Nigeria.

3. CURRENT STATUS OF SUSTAINABLE HOUSING DEVELOPMENT (SHD) IN NIGERIA

With a rapidly soaring population of 170 million inhabitants, Nigeria is urgently in need of sustainable solutions to the many socioeconomic challenges confront her development. Leading amongst these, are the rampant corruption, endemic poverty and inadequacy in social infrastructure. These challenges manifest basically in poor housing with resultant effects on health, water and sanitation. The palpable lack of the defined social amenities has spurred the metamorphosis of slums and shanty towns across the country.

The definition of a slum, according to the United Nations Human Settlements Programme [41], "is any contiguous settlement where the inhabitants are characterized as having inadequate housing and basic services" [36]. In addition, slums are typically categorised as households or collection of households that evidently lack access to water, sanitation, secure land tenure, durable building structures and overcrowded living spaces [37]. Hence there exists a correlation between lack of sustainable housing and slum growth around the world. According to the UN Habitat, the rate of slum development will increase geometrically over the years with 2 billion people or 25 % of global population living in slums or shanty towns [38]. Figure 2 presents an overview of slum growth rates in nations with large slum populations like Nigeria.

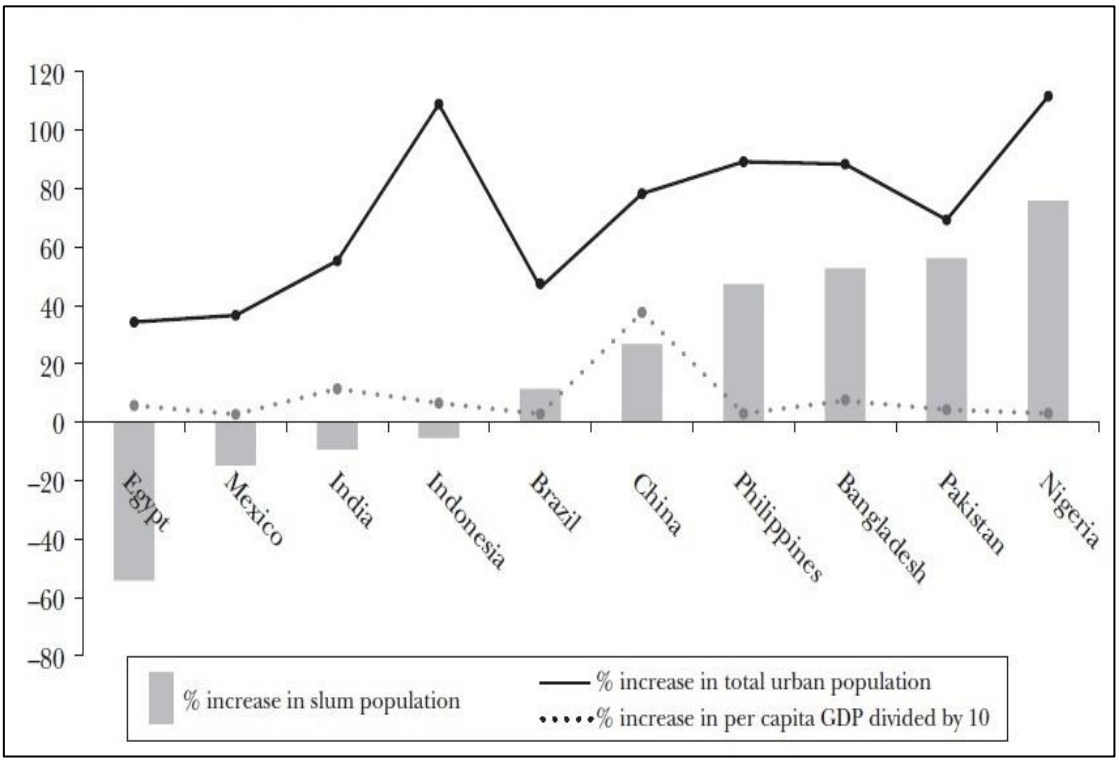

Figure 2: Patterns in Urban and Slum Growth from 1990 – 2007 [39].

Table 1: Slum growth rates of selected developing nations [40].

COUNTRY	SLUM ANNUAL GROWTH RATE %	SLUM POPULATION (000)	SCENARIO 2020 WITH NO CHANGE
Angola	5.28	3,918	10,677
Kenya	**5.88**	**7,605**	**23,223**
Nigeria	4.96	41,595	76,749
South Africa	0.19	8,376	8,677
Uganda	**5.32**	**3,241**	**8,904**
Tanzania	**6.16**	**11,031**	**35,561**
Brazil	0.34	51,676	55,074

Figure 2 presents a diagrammatic representation of the general growth in urbanization, slum population, and economic growth ranked from 1990 to 2007. Comparatively, Nigeria is amongst nations with high slum population growth rate over the period evaluated. This is corroborated by the data on slum growth rates presented in Table 1. According to the presented data, with an annual slum growth rate of 4.96% Nigeria's slum population is set to soar to 80 million by the year 2020 which marks the end of the SDGs. Furthermore, results from empirical studies have identified a significant correlation between rapid urbanization, economic growth and rise of slums. The results showed that the persistent economic deprivation in rapidly urbanized societies often results in the growth of slums typically characterized by impoverished conditions such as low human capital, poor housing and living conditions [41].

Consequently there is evidence that current state of sustainable housing in Nigeria is abysmal with predictions of higher rates of social, economic and environmental challenges in the future. However, to critically examine the current status of Nigeria's sustainable housing scenario, or lack of, a Sociotechnical Innovation Systems (SIS) approach is employed. The SIS will evaluate national laws and policies and long term goals, activities of key stakeholders, financial structures and other relevant issues in the sector.

3.1 Laws, Policies and Goals

The socioeconomic growth and sustainable development of any nation is significantly reliant on national laws, policies and legislative guidelines. According to the 1999 constitution, every Nigerian has the right to acquire and possess fixed property. Due to the importance of housing provision to socioeconomic development, successive regimes in Nigerian since independence in 1960, have initiated various housing policies and programmes to ensure SHD. The most important yet controversial policy relative to SHD is the Nigerian Land Use Act of 1978. According to the law, the right to ownership of land in urban areas is chiefly managed, allocated and administered by the Governor of the Nigerian State through the Land Use and Allocation Committee [42, 43]. An overview of the various Nigerian housing and land policies are presented in Table 2.

Table 2: Housing and Land Laws and Legislation in Nigeria [44-46].

Policy/Initiative	**Year Established**	**Policy Directives**
Federal Housing Authority (FHA) Act	1973 (Expanded in 2006)	The Act was established to lay the groundwork and legal framework for the National Housing Programme and other housing programmes approved by the Federal Government. The mandate of the FHA is; Develop and manage Real estate on a commercial basis in all 36 States and the Federal Capital Territory; Provide sites and services for all Nigerians with distinctive emphasis low income earners; Provide low income and rural housing nationwide using FGN and other funding sources; Make policy endorsements to the FGN on matters of urban and regional planning, social infrastructure and utilities relevant to the execution of approved housing programmes.
Land Use (LU) Act	1978 (Amended in 2014)	The Land Use Act was established to administer, manage and allocated lands within urban areas to citizens of the Federal Republic of Nigeria. Under the LU Act, urban lands are managed by State Governors and administered by the State's Land Use and Allocation Committee who dispense land and grant of Certificates of Occupancy (C-of-)O). Rural lands are to be managed by Local Government Councils through their Land Allocation and Advisory Committees. LU Act also stipulates that the C-of-O does entitle or grant the holder ownership of the land but statutory occupancy. This Act is constantly in contention and a committee was created to develop a bill to amend the Act.
National Housing Programme (NHP) Act	1980	The NHP was established to provide medium and high income housing units around the country by the FHA. The policy led to the establishment of Shagari low cost housing estates.
Housing for All by the Year 2000 A.D	1990	This initiative was aimed at providing all Nigerians with access to decent housing at affordable prices before the end of year 2000 A.D. The directive was aimed at building 8 million housing units in urban and rural areas of the country by the year 2000A.D. Furthermore, the initiative sought to ensure the private sector involvement in national infrastructural provision and serve as the main vehicle for organization and delivery of sustainable housing development. In effect, the policy reorganised the financial direction and access to housing loans creating a dual financial structure, between the Federal Mortgage Bank of Nigeria (FMBN) as the apex and supervisory agency and mortgage institutions as prime lenders.
National Housing Fund (NHF) Act	1992	The NHF can be seen as the ultimate culmination of the previous efforts of Nigerian governments at housing provisioning
Federal Mortgage Bank (FMB) Act	1993	To ensure a sustainable supply of long term loans to Nigerian citizens for the purpose of acquiring, construction, and development of residential assets. The Act certified the

		establishment of the Federal Mortgage Bank of Nigeria (FMBN), as the apex and supervisory agency and secondary mortgage institution, providing credit facilities to primary mortgage institutions, real estate development companies, housing corporations or organisations.
National Housing Policy (NHP) Act	1992 (Amended 2004, 2006, 2014)	The Act serves as the primary legal document for authorizing the FGN, Institutions and Nigerians source, disburse and channel taxpayer funds into the National Housing Fund (NHF). In addition, The NHP, aims to ensure that the provision of housing units are based on realistic standards which the house owners can afford; To prioritize low income housing programmes; To boost household ownership of houses through provision of long and or short credit facilities; Stimulate an enabling environment for better private sector participation and strengthen existing public institutions involved in sustainable housing development.
Affordable Home Ownership (AHOS) Scheme	2014	The Federal Governments launched in 2014 “Affordable Home Ownership Scheme” to provide homes at minimum price of N4.5 million per house payable in full after 15 years maximum.

As presented in Table 2, the legal dynamics of sustainable housing development in Nigeria is well established with core objectives that mirror the targets of the SDGs Agenda. Furthermore, the existence of the legal dimension to SHD in Nigeria serves as searchlight as well as a legal yardstick for socioeconomic growth and sustainable housing. The long term benefits of such policies also include increasing investor confidence, infrastructural development and employment generation.

3.2 Key Players

At the heart of any innovation system is the existence of key players or major stakeholders who are responsible for the design, development and implementation of the strategic objectives of the innovation [44]. Consequently social innovations like housing development also require a health assembly of stakeholders to function effectively. Typically, the housing sector of any economy is first and foremost guided by laws, policies and directions instituted by all tiers of government. Statutorily, the responsibility for implementing housing policies in Nigeria falls on the government through its many Ministries, Departments and Agencies or Parastatals.

In general, the major stakeholders in the Housing Sector of Nigeria are; the Government, private organisations, and Nigerian citizens [45] which can broadly be categorised into Technology Policy Initiator, Policy Executor, and Policy Beneficiary. Table 3 presents a summary of the major stakeholders and their responsibilities in the establishment of SHD in Nigeria.

In addition, the objective of a ministry like the Federal ministry of Lands, Housing and Urban Development (FMLHUD) is to guide policies, proposals and amendments relating to National Lands and Housing in addition to Urban Development programmes and plans. Its function also includes supervising the actions of the Federal Housing Authority (FHA), Federal Mortgage Bank of Nigeria (FMBN), and Registration Boards of relevant Nigerian professional associations cited in Table 3. Other stakeholders include Independent consultants, Manufacturers, Non-Governmental Organisations (NGOs), Charities, Policy Groups and Think Tanks collectively responsible in various capacities for SHD in Nigeria.

3.3 Financial and Market Structures

The establishment, survival and growth of any housing market dependents on access to long term supply of funds. The provision of funds is vital to the construction of buildings, subscription to taxes and excise duties as well as for the purchase of houses by the citizenry. Consequently, the health of the housing market is significantly dependent on the financial sector particularly mortgage banks, building societies and commercial banks in the country. As a result, the successful implementation of sustainable housing development and ancillary policies needs to account for access to funds for all major stakeholders in the housing sector.

In Nigeria, this responsibility falls within the statues of the Federal Mortgage Bank of Nigeria (FMBN) established in 1956. The FBMN is the nation’s principal apex mortgage institution with the onus of supervising the contributory National Housing Fund (NHF) and mobilizing long term funds for the Nigerian populace. Other institutions with mandate to lend to customers requiring financing for housing in Nigeria include commercial banks, microfinance banks and mutual/hedge funds. Basically the financial and market structure dynamics of the SIS aims to provide the funds needed to ensure SHD in the country.

Table 3: Major Stakeholders in Sustainable Housing Development in Nigeria [43].

Major Stakeholder	Designation	Role in Innovation System	Founding Objectives/Duties
Federal, State, Local Government	National Government	Technology Policy Initiator & Policy Beneficiary	To institute, implement and supervise land and housing laws, guidelines and policies in the country.
Nigerian Citizens	Nigerian Citizenry	Policy Beneficiary	To enjoy the complements of housing laws, guidelines and policies in the country.
Federal Ministry of Land, Housing and Urban Development (FMLHU)	Government Agency	Policy Executor	Supervisor ministry for the lands, housing and urban development and administration in Nigeria. Umbrella agencies for supervising the; Architects, Builders, Estate Surveyors, Quantity Surveyors and Town Planners.
Federal Mortgage Bank of Nigeria (FMBN)	Financial Institution	Technology Policy Initiator & Policy Executor	Providing credit facilities, financing for housing, mortgage refinancing, purchasing/ warehousing, and securitization.
Federal Housing Authority (FHA)	Government Agency	Technology Policy Initiator & Policy Executor	To mobilize and disburse long-term funds from Nigerian, banks, insurance companies and FGN to advance concessionary loans to its contributors and meet its mandate to the FMBN.

4. CHALLENGES OF SUSTAINABLE HOUSING DEVELOPMENT (SHD)

Despite the best efforts of all stakeholders in the Nigerian Housing innovation system, sustainable housing has at best remained a pipe dream.. The process has been plagued by numerous social, economic, environmental and policy setbacks such as the Land Use Act. The next section will enumerate and briefly discuss the major challenges of SHD in Nigeria.

4.1 Affordability and Financing

As already mentioned, financing of housing development remains a major issue in Nigeria. Currently, access to housing credit, mortgage or loans is out of the reach of many Nigerians due to high interest rates and collateral guarantees required. As a result, the bulk of the Nigerian populace cannot afford to borrow to finance their dreams of home ownership due to a lack of a healthy financial system.

Empirical data around the globe highlights Nigeria's homeownership rate in urban areas is around 10 % compared to 97 % for Romania; 74 % for Brazil; and 62 % for South Africa [46]. The low rate points to not only ineffectiveness of the housing laws but also fiscal policies instituted for attaining sustainable housing in Nigeria.

4.2 Policy and Regulatory Framework

Lack of legislation and regulatory policies have also been the bane of growth in major sections of the Nigerian economy. As a result, growth in the quantity and quality of the housing stock in the country remains poor due to what can be termed a *cost minimization over value maximisation* conundrum. In addition, lack of regulatory bodies and legal building codes have resulted in poor buildings all over the country. Consequently, these issues nurture pertinent questions about the legislative causes of Nigeria's failure to adequately house its citizens since independence. Hence, the pertinent questions that

need to be addressed by analysts and housing experts include; what tangible measures can aid the implementation of Nigerian government housing policies? Why are the administrative bottlenecks and bureaucratic lapses hindering housing development in Nigeria? What legislative measures and or structural reforms are required to stimulate growth in the sector by the year 2020? Are Nigeria's goals and targets on housing aligned with the realities on ground in the country? Do Nigeria's long term housing, land and urban development objectives mirror the targets of Goal 11 of the SDGs? These are but a few of the pertinent questions that require attention for the attainment of sustainable progress in the Nigerian SHD drive.

4.3 Lack of Research and Development

The role of R&D in the growth and development of sociotechnical innovation systems such as housing cannot be discounted. Therefore, research on the social, economic, environmental and geopolitical aspects of housing can significantly stimulate reforms in the sector. The real estate sector is the 6th largest in the Nigerian economy and requires concerted efforts to research and develop innovative technologies, techniques and policies for effective housing development. All educational institutions, agencies, professional associations and unions must rise to the task of solving the problems plaguing housing sector in the country. Research into the use of affordable, renewable and sustainable building materials as well as sustainable practices in the construction industry will aid SHD in Nigeria [47-50]. Solutions to socioeconomic are required to address bottlenecks such as financing, administration and registration of land, housing and urban development.

5. PROSPECTS OF SUSTAINABLE HOUSING DEVELOPMENT (SHD)

Despite the outlined challenges, SHD has numerous prospects for the socioeconomic growth and sustainable development of Nigeria. The prospects can be evaluated based on socioeconomic, environmental and geopolitical dimensions. The social benefits of sustainable housing include the provision of affordable, resilient and sustainable homes for all citizens. Furthermore, sustainable housing developments will provide residents with improved amenities and social infrastructure such as water, sanitation, waste management and protection against diseases. In addition, it can potentially reduce social ills like rampant crime, juvenile delinquency, infant mortality, chronic diseases and poor living conditions characteristic of slums. With improved living conditions, low crime and social infrastructure provision small and medium scaled businesses will thrive thus increasing the overall standard of the living of the citizenry.

The potential environmental benefits of improved standards of housing and living conditions include efficient municipal solid waste, waste water and sludge disposal and management. The deprived conditions in slums and shanty towns exert significant pressure on the environmental variables such as air, water and soil through wanton disposal of waste, air and water pollution. With improved housing and sustainable environment such issues are reduced to minimal levels. Furthermore, improved soil and water quality can potentially stimulate agriculture, aquaculture as well as other opportunities for efficient land utilization. Employment generation and improved standards are also long term benefits of sustainable housing development.

The geopolitical benefits of SHD can result in improved policies formulation, legislative frameworks and long term goals aimed at creating sustainable cities and communities. With improved living standards, citizens of nations can actively dedicate their time, resources and human capital to global debates and other productive ventures aimed at growth, development and prosperity.

6. CONCLUSION AND RECOMMENDATIONS

The paper examined the prospects and challenges of sustainable housing development (SHD) in Nigeria using the Sociotechnical Innovation Systems (SIS) approach. The findings indicated that successful implementation of any innovation policy such as SHD significantly depends on the major stakeholders, laws and policy regulations, and access to adequate finance. The challenges of SHD were identified as lack of finance, lack of coherent policy framework and poor state of R&D in the country. Despite the challenges, the prospects of SHD are considered high considering the fact that, the Nigerian Government is currently diversifying from mono-petroleum based economy to others sectors, like the construction industry, whose activities have congruent effect on other industries. The authors are of the opinion that engaging SHD will effectively improve living standards, eliminate social ills, chronic diseases and improve overall socioeconomic activity, environmental sustainability and geopolitics of Nigeria.

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