

Original Article

Evaluation of Population Projection on Housing Demand in Edo State, Nigeria

Olotu. Y¹, Elamah. D², Dania. S.F², Momoh. S³

¹Department of Agricultural & Bio-Environmental Engineering, Auchi Polytechnic, Auchi, Nigeria.

²Department of Building Technology, Auchi Polytechnic, Auchi, Nigeria.

³Department of Urban & Regional Planning, Auchi Polytechnic, Auchi, Nigeria.

¹Corresponding Author : realyahaya@yahoo.com

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Abstract - Nigeria's population is continuing to rise at an unprecedented rate, making the need for suitable housing a critical issue. The study aims to assess how the population forecast in Edo State, Nigeria, will affect the demand for housing. The study employs a quantitative methodology, examining past demographic data and housing statistics gathered from multiple sources. The results show that over the next ten years, Edo State's population is predicted to grow gradually. It is anticipated that Edo State's population will rise by 6.02 million by 2030, which will have an effect on housing demand because there is currently a 0.6 housing unit deficit (DHU). This projected population growth will inevitably result in a surge in housing demand. The study further examines the factors influencing housing demand, such as urbanisation, economic development, and social trends. Additionally, the research analyses the current housing supply in Edo State and identifies potential challenges in meeting future housing demand. The study concludes that adequate measures need to be taken to address the increasing housing demand in Edo State, including innovative housing policies and investment in housing infrastructure.

Keywords - Suitable housing, Housing demand, Population, Unprecedented rate, Housing unit deficit.

1. Introduction

The need for housing in Nigeria has increased significantly as a result of the country's rapid urbanization, which is typically linked to migration for socioeconomic reasons such as work, education, and other opportunities. The most basic demand is for housing, as has been shown by studies by Gonzalez and Ortega (2013) and Mussa et al. (2017). As a result, large-scale population migration has also encouraged the development of real estate markets in the areas where people are moving into the city. The state was listed as the 24th most populous in Nigeria (3,233,366) as of the results of the 2006 national population census. By 2022, the state's population is predicted to reach roughly 4,777,000 (Koutonin, 2016).

Population expansion is a global phenomenon observed in all countries, developed or underdeveloped, according to the United Nations Population Fund (UNPF, 2017). Affordable housing is becoming more and more in demand throughout Nigeria, not only in Edo State. Nigeria's housing demand is rising daily; however, the majority of the country's citizens are unable to afford the ideal home (Olotuah, 2005). Challenges related to housing demand include the depreciation and degradation of the environment, as well as strains on current services, utilities, and facilities (Ibama et al., 2015).

Financial difficulties have arisen in every area of the human socioeconomic index as a result of population growth, which has been the primary driver of the exponential demand for housing units. Over 80% of Nigerians currently spend over 35 percent of their salary on housing, according to the Guardian (2022), leaving very little money for needs like food, clothing, medical care, education, and other crises. A two-bedroom in Edo State used to cost N200,000/N250,000 in 2020, but it now costs N450,000 in 2021. A one-bedroom used to cost N150,000/N180,000, but it currently costs N300,000. In certain upscale areas, such as the Government Reserved Area (GRA), the average annual cost of a three-bedroom flat has increased from N400,000 to N700,000 and even up to N1 million annually. Additionally, the ongoing two-digit inflation has skyrocketed the prices of building materials, which has a negative impact on the development of reasonably priced buildings. The rapidly increasing cost of building materials has driven out numerous developers.

It is anticipated that Edo State will have five million residents by 2024, necessitating a 60% increase in housing units. Addressing this presents a great deal of uncertainty because of the rising cost of construction materials and, largely, the limitations imposed by land use and procurement procedures. Consequently, all levels of government should be



involved in supplying moderately priced housing units through public-private partnerships and subsidising the cost of building materials in order to slow the rate of increase in housing prices. Furthermore, the government must assume responsibility for overseeing and enforcing regulations pertaining to the procurement of building materials and land. Additionally, local governments have regularly adopted regulation and control policies like purchase restrictions, loan limits, price limits, and sales restrictions in order to slow down the uncontrollably rising prices of housing that were caused by an imbalance between supply and demand in the real estate market and the mismatch of land resources in recent years (Yingchao *et al.*, 2018; Li and Xu, 2016). They have also been continuously exploring and improving the affordable mechanisms.

Housing is ranked second in terms of essential human needs, behind sustenance (Ibrahim and Ali, 2022). It includes the physical shelter and living space, as well as any services required for the family's social and physical well-being (Odeluyi, 1992). Housing has an indisputable effect on people's well-being, productivity, and health. As a result, it is crucial to develop every mechanism necessary to set up a practical system that would guarantee Edo State's growing population access to inexpensive housing. The population will be accommodated and protected by this, and the problems brought on by this infrastructure shortage will also be avoided.

1.1. Statement of the Research Problem

The increasing population has been a major impediment to adequate programme planning, execution, monitoring, and evaluation. This phenomenon is not limited to Edo State but spans the entire length and breadth of Nigeria. Some of the population-related studies have revealed that the influx of immigrants, mostly from the other south-south states of Nigeria, to Edo State has led to an increase in population by 35% in reference to the 2006 population census. The outburst of this level of immigration could be linked to the comparative advantage of relative peace and possession of large arable land. Hence, housing unexpected population growth becomes a chaotic task, and this eventually leads to increasing prices of house rent and building construction costs. Addressing this situation, a hincast population growth projection is expected to be established to develop a population-housing demand mechanism for reducing the slum index and improving affordable housing.

1.2. Research Question

In fulfilling the main objective of this study, the following research questions are developed:

- i. Will future population growth affect the prices of house rent and building construction costs?
- ii. Will the injection of 1,000 annual units of 2-bedroom bungalows significantly reduce housing demand?

1.3. Justification of the Study

Having accepted that unexpected population growth as a result of immigration and birth has posed a great challenge to housing demand in Edo State, this study becomes highly imperative. The outcome of the study is not limited to addressing the future of house demand but to resolving some silent issues that are attributed to a deficit in accessing an affordable housing unit for the present and future periods. Some of the challenges constantly linked to the housing deficit are the increasing crime rate, unemployment, and low health index. Based on this, it is important to have good knowledge and understanding of how future population growth will affect the prices of house rent and the cost of building construction in order to develop an integrated model to solve the problem.

1.4. Scope of the Study

The study is limited to Edo State, which comprises 18 LGAs (local government areas), and these LGAs are structured into three senatorial regions: Edo North, Edo Central, and Edo South, respectively.

2. Materials and Methods

2.1. Study Area

The state of Edo in the Federal Republic of Nigeria is located in the south-to-south geopolitical zone. As of the 2006 national population census, the state had 3,233,366 inhabitants, ranking it as the 24th most populous state in Nigeria. The state's population is anticipated to reach 4,777,000.0 by 2022. Edo State is the 22nd largest state in Nigeria by landmass (Figure 1).

The capital and largest city of the state, Benin City, is also the hub of the rubber industry in Nigeria, ranking as the fourth largest city in the nation. It was established in 1991 from the erstwhile Bendel State and is referred to as the nation's beating heart. Ondo State borders Kogi State to the west, Anambra State to the east, Delta State to the southeast and south, and Ondo State to the north. Kogi State borders Kogi State to the north for 133 km and across the Niger River for 81 km to the northeast.

2.2. Population Projection

Population projections can be used to plan food and water use and public services such as health, housing, and education. Zoning and other demographic boundaries rely on population projections as well. Businesses use population projections for store location planning and marketing. Such projections also affect federal and state funding. A simple equation for population projection was applied to estimate the Edo State population as expressed as follows:

$$N_t = P e^{rt} \tag{1}$$

Where N_t is the number of people at a future date, (P) is equal to the present population, e is the natural logarithm base

of 2.71828, (r) represents the rate of increase divided by 100, and (t) represents the time period.

Extrapolation is a projection technique that uses aggregated data from the past to project into the future. In population projections, past and current census information was used to project future population size as follows:

$$P_{t+n} = P_t + b(n) \quad [2]$$

Where,

- P_{t+n} is population at a future date in time
- P_t is the population at the last census
- n is the number of units for the projection
- b is the average growth increment per unit of time.

Hence, the average growth increment per unit of time (b) was estimated as follows:

$$b = \frac{\sum_t^d (P_t - P_{t-1})}{m} \quad [3]$$

Where,

- d is the data of the last census,
- m is the number of the historical interval
- t is the time index (year of decade)



Fig. 1 Map of the study area

Data sources: OCHA, ESRI-WFP, DCW OSM, OSGOF, Copernicus

2.3. Population Projection and Housing Demand

A better estimate of the future number of households may be obtained either (a) by calculating the rate of growth of the adult population of, for instance, 20 years and over, or between 20 and 50 or 25 and 70 years old, from the base year to the year of the projections, then applying this rate of growth

to the number of households at the base year; (b) by applying the ratio between the number of households at the base year and the adult population for the same year, to the future adult population for the year of the projections, since household formation is usually confined to this section of the population." Estimates of the ratio for the future years are made in the following formula:

$$h_t = 1 - (1 - h_{2020}) * \left(\frac{1 - h_{2030}}{1 - h_{2020}} \right)^{\frac{(t-2020)}{10}} \quad [3]$$

Where h_i denotes the ratio of total households to the population aged 20-50 in year t ; h_{2020} denotes the said ratio in 2020 as obtained from the 2020 census; and h_{2030} denotes the ratio in 2030 as obtained from the 2030 census.

The value of "10" (Ten) in $\frac{(t-2020)}{10}$ as the power in the equation means the number of years from 2020 to 2030.

2.4. Data Collection

The baseline housing units' dataset was collected from the Ministry of Housing and Urban Development in Edo State, Nigeria. The dataset ranged from 1993 to 2022. Also, the dataset on the price of house rent and building construction was obtained from the Ministry of Physical Planning in Edo State. The dataset on the baseline population as of 2006 and the projected population for 2011 was also extracted from the archive of the Ministry of Housing and Urban Development.

3. Results and Discussion

3.1. Population Growth

Population projections are "what-if" scenarios designed to illustrate potential changes in the number and composition of the population. These forecasts rely on a number of assumptions about the rates of migration, mortality, and fertility in the future. Predicting the future population of the region requires a fundamental grasp of the patterns of movement into and out of Edo State. Every year, over 120,000 individuals relocate to Edo State from other states, while 40,000 people depart the state on average. Not only is the state's industrial activity in the Edo North Region a major factor in the state's annual population influx, but the state also enjoys relative tranquillity in comparison to other south-south states in Nigeria. According to Table 1's results, Figure 2a shows that by 2030, the population is expected to reach 6.120 million and a Total Labour Force (TLF) of 4.95 million. Therefore, if the present trend in economic dynamics continues unchecked, almost 50% of TLF will be underemployed. Housing covers a variety of possibilities, from flats and houses to temporary shelters and emergency accommodations. Housing guarantees that people in society have a place to live, whether it is a home or some form of physical building for residence, lodging, or shelter (Gwendolyn, 1983). A person's health, safety, and well-being depend on their ability to access safe, cheap, and stable housing. Because housing affects a person's access to social

networks, work, healthcare, education, and other resources, it can also have an effect on their economic, social, and cultural chances (Dunn, 2020). The main driver of the state's exponential housing demand, as well as the rising cost of building supplies and housing itself, has been Edo State's population growth. The issue will get worse due to expected

population growth and the potential decline of the labour force by 2030; thus, as our study has shown, by 2030, the ability of the labour force to find gainful employment and earn a decent wage will be compromised, making housing units in Edo State unaffordable and inaccessible for the swarming population.

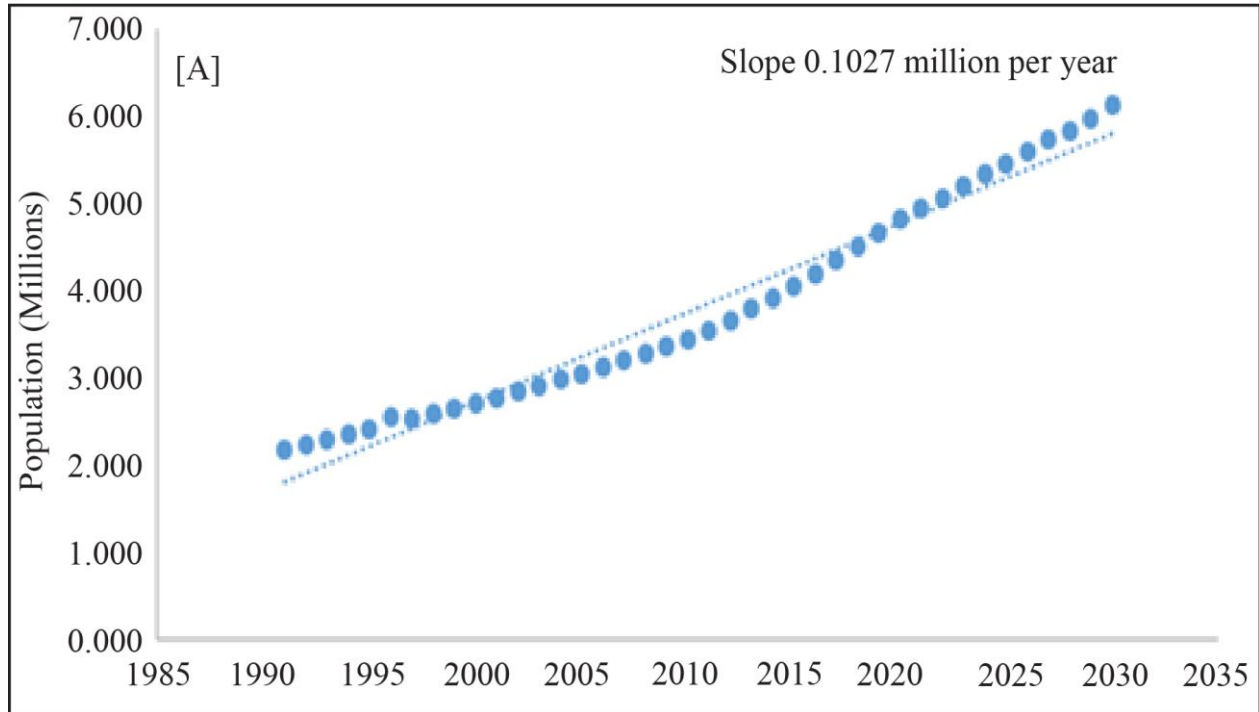


Fig. 2(a) Projected population trend in Edo State

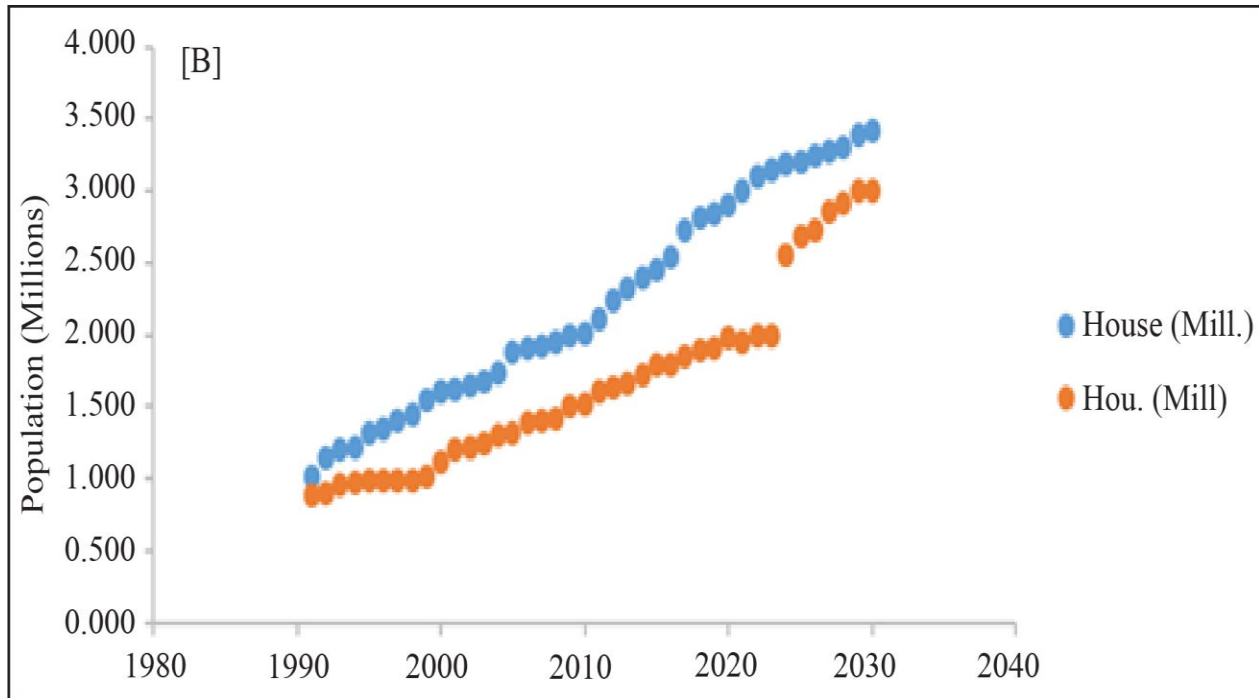


Fig. 2(b) The projected relationship between the household and housing unit

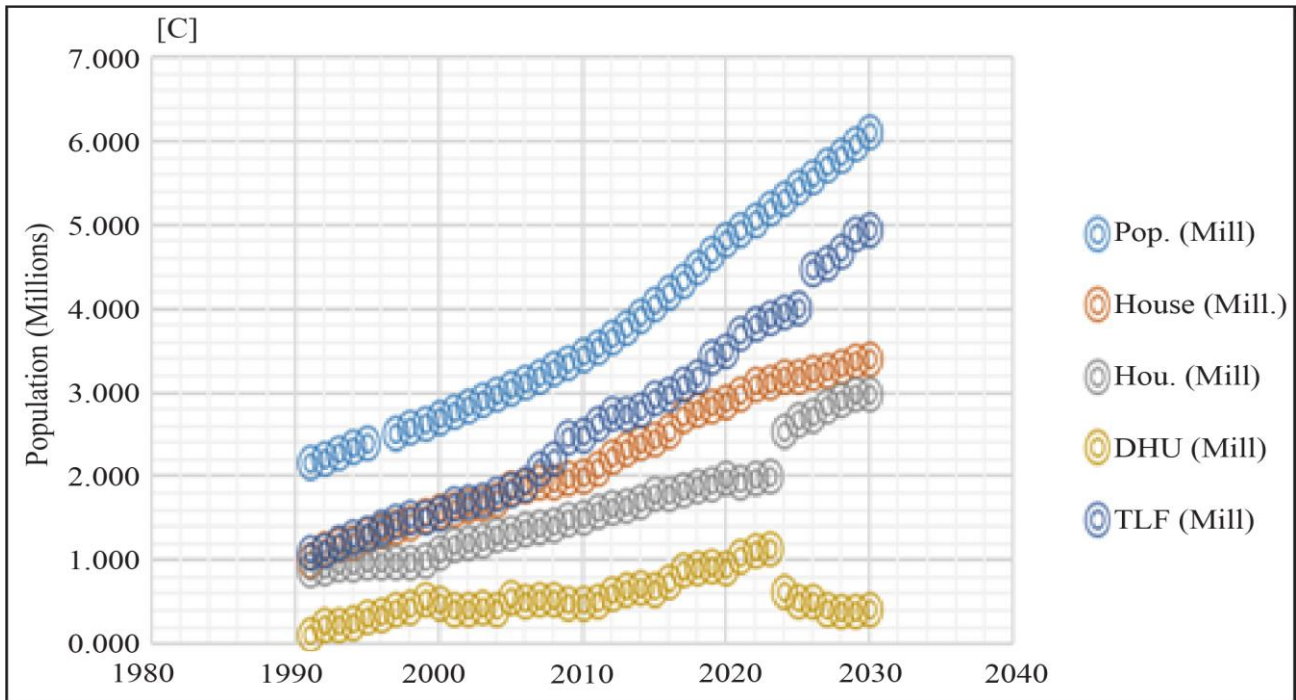


Fig. 2(c) Projected population and housing indices

The need for housing changes as a result of population growth. Housing demand rises as a result of population growth, especially the expansion in the number of households. In the long run, a fall in population could result in less demand for homes. The significance of comprehending the underlying transmission of households is highlighted by the significant aggregate effects of housing unit demand. The association between variations in housing strength and the ingesting response has been of particular focus since the financial crisis.

Figure 2b illustrates the expected rise in Edo State families with a high demand mismatch for housing units by 2030. The bulk of households' uneven financial strength and capabilities may be the cause of this. If and when the necessity comes, the wealthy household might have the resources to either build or purchase a home.

However, before they can purchase or construct a home, those with low and moderate incomes might need to save for a while. Therefore, a variety of circumstances may arise throughout this saving time, making the plan's goal of obtaining a cheap home impractical. These developments include shifts in priorities, government policies, inflation, and so forth. As a result of the wealth impact, Iacoviello and Neri (2020) found that rising home wealth may improve collateral, lessen credit limitations, and boost consumption.

According to the report, there is a direct correlation between the housing shortfall and a number of social vices, such as excessive unemployment, rising crime, poverty, poor

health, and mediocre economic growth. By 2030, the population of Edo State is predicted to reach 6.02 million, with over 53% residing in cities.

Based on population growth, the housing deficit in 2022 is expected to be over 1.119 million, while the peak housing deficit unit (DTU) in 2023 is expected to be 1.139 million, as shown in Figure 2c and Table 1. In 2024, the DTU is expected to rise by 0.420 million, but it indicates a downward decline of 0.634 million in 2024 to 0.393 million in 2029.

The faltering economy and high inflation have led to a sharp increase in the cost of building materials, which is a significant obstacle to housing supply. The average Nigerian cannot always afford the high prices of construction due to the country's high land costs, particularly in urban areas, and the rising cost of building supplies. A significant portion of the nation's cement market is controlled by just three firms, creating a near-monopoly in the building materials business. A relatively small percentage takes up building houses, after which they charge outrageous rents.

The anticipated decline in DTU between 2024 and 2029, however, might be related to the potential construction of inexpensive structures, like rooms or two-room buildings, in order to meet all of the financial difficulties brought on by the primacy of want. The projection's output indicates that, in order to guarantee sustainable housing units in Edo by 2030, an average of 0.561 million housing units must be built per year.

Table 1. Baseline and projected housing (in Millions) in

N/S	Year	Pop. (Mill)	House (Mill.)	Hou. (Mill)	DHU (Mill)	TLF (Mill)
1	1991	2.173	1.011	0.881	0.130	1.101
2	1992	2.231	1.141	0.905	0.236	1.131
3	1993	2.291	1.203	0.955	0.248	1.211
4	1994	2.353	1.220	0.971	0.249	1.282
5	1995	2.411	1.314	0.983	0.331	1.333
6	1996	1.353	1.352	0.987	0.365	1.403
7	1997	2.530	1.411	0.987	0.424	1.471
10	1998	2.593	1.442	0.991	0.451	1.512
11	1999	2.650	1.552	1.011	0.541	1.511
12	2000	2.714	1.600	1.111	0.489	1.571
13	2001	2.773	1.622	1.200	0.422	1.681
14	2002	2.841	1.652	1.222	0.430	1.700
15	2003	2.911	1.683	1.241	0.442	1.740
16	2004	2.988	1.732	1.300	0.432	1.800
17	2005	3.050	1.880	1.325	0.555	1.850
18	2006	3.130	1.903	1.388	0.515	1.910
19	2007	3.210	1.930	1.401	0.529	2.110
20	2008	3.293	1.952	1.423	0.529	2.224
21	2009	3.371	1.992	1.500	0.492	2.471
22	2010	3.451	2.011	1.517	0.494	2.511
23	2011	3.541	2.110	1.600	0.510	2.630
24	2012	3.666	2.240	1.631	0.609	2.750
25	2013	3.790	2.330	1.670	0.660	2.750
26	2014	3.923	2.401	1.715	0.686	2.810
27	2015	4.061	2.451	1.791	0.660	2.940
28	2016	4.200	2.540	1.800	0.740	3.000
29	2017	4.351	2.732	1.845	0.887	3.110
30	2018	4.501	2.811	1.900	0.911	3.210
31	2019	4.661	2.851	1.914	0.937	3.443
30	2020	4.831	2.901	1.982	0.919	3.501
31	2021	4.950	3.000	1.950	1.050	3.710
32	2022	5.070	3.110	1.991	1.119	3.830

33	2023	5.200	3.140	2.001	1.139	3.900
34	2024	5.330	3.190	2.556	0.634	3.960
35	2025	5.460	3.200	2.681	0.519	4.010
36	2026	5.590	3.240	2.732	0.508	4.490
37	2027	5.730	3.280	2.854	0.426	4.550
38	2028	5.830	3.310	2.911	0.399	4.700
39	2029	5.970	3.390	2.997	0.393	4.900
40	2030	6.120	3.420	3.000	0.420	4.950

4. Conclusion

This study evaluates the impact of the anticipated population growth on Edo State's housing demand. The insufficiency of land distribution, funding, mortgage institutions, infrastructure, inflation, and the rapidly increasing costs of building supplies have all been blamed for Edo State's subpar housing delivery. Due to overcrowding, Edo State's housing shortage issue is becoming worse every day, especially in the metropolitan centres. The study revealed that the population of Edo State is projected to hit about 6.02 million and the total labour force to be 4.950 million by 2030, with projected housing coverage of about 45.4%. However, for Edo State to have significant and affordable housing coverage, mostly in urban centres, to bridge the 55.6% housing deficit, this is a serious concern. Governments at every level need to actively get involved in the formation and implementation of comprehensive housing policies that are free from corruption and bureaucratic bottlenecks. Also, housing mortgage loans and facilities should be extended to not only the public or civil servants but also willing private individuals with the capacity to repay them and relevance.

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