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Evaluation of the Existing Infrastructural Facilities for Slum Upgrading Plan and Measures of old Orozo Township, Federal Capital Territory, Nigeria

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Abstract: Provision of infrastructural facilities is essential for sustainable living of any developed city, lack of infrastructural facilities most times result to movement of people from one point to another. The Study focused on evaluating existing infrastructural facilities for slum upgrading plan and measures of Old Orozo Township, Federal Capital Territory, Nigeria. During the reconnaissance survey the study area was delineated into five (5) zones, with a total of 63,070 housing unit, a total of 380 respondents were sampled Krejcie and Morgan (1970) formula. Questionnaire was used to collect information on evaluate the existing infrastructural facilities in housing of the study area data were analyzed using inferential and descriptive statistics. The results obtained shows that the study area lacks portable water supply, modern sewage, appropriate drainage facilities, refuge disposal and poor road infrastructures. Also, majority of respondents in Zone A (57%), B (53%), C (54%), D (51%) and E (37%) practiced open dumping. The study also revealed that in majority of the respondents in Zone A, B, C, D and E, (79%, 77%, 64%, 84% and 77%) indicated that buildings in the study area are mostly for residential purposes. The study area is dominated with old buildings as respondents in Zone A, B, C, and D (29%, 33%, 34% and 23%) indicated that most of the houses in the study area are 40 to 49 years old while highest percentage of respondents in Zone E (28%) indicated that the houses are up to 50 years. Furthermore, appropriate slum upgrade was perceived as the appropriate upgrading measures considering the policies that can be employed to improve the standard of living of inhabitants and enhance the physical condition of the indigenous community of Orozo. It is therefore, recommended that government should provide Incentives and infrastructures to enable people who wish to embark on housing development within communities other than the capital city. Adequate publicity should be given to these measures even before they are embarked upon especially through extensive consultations with residents and citizens of the community.

Keywords*: Infrastructural, Facilities and Slum Upgrading.*

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I. INTRODUCTION

Infrastructure constitutes the physical and organizational framework that supports the functioning of a society, enabling economic activities, social services, and sustainable development. It encompasses facilities such as transportation networks, water supply systems, sanitation, electricity, telecommunication, educational institutions, health facilities, and market structures. Adequate and well-maintained infrastructure is a critical driver of economic productivity, social wellbeing, and environmental sustainability (World Bank, 2019). The availability, accessibility, and quality of infrastructural facilities determine the extent to which communities can engage in economic activities, access essential services, and improve their quality of life (Calderón & Servén, 2014).

In developing countries, the state of existing infrastructure often reflects disparities in planning, investment, and maintenance. Many communities suffer from inadequate facilities, aging infrastructure, and poor service delivery due to limited financial resources, weak institutional frameworks, and rapid urbanization (UN-Habitat, 2020). These challenges are particularly pronounced in markets, public institutions, and rural settlements, where infrastructure deficits hinder economic productivity, compromise public health, and exacerbate inequality (Estache & Fay, 2010).

Evaluating existing infrastructural facilities is essential to understanding their adequacy, efficiency, and capacity to meet current and future demands. Such evaluations provide decision-makers with empirical evidence for resource allocation, prioritization of interventions, and sustainable

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infrastructure planning (Aschauer, 1989). This process involves assessing both the physical condition of infrastructure and the adequacy of associated services, identifying gaps, and proposing measures for improvement.

In the Nigerian context, infrastructure challenges are multi-faceted, ranging from inadequate electricity supply, poor road networks, insufficient potable water systems, to deteriorating public market facilities (NBS, 2021). Rapid urbanization and population growth, particularly in peri-urban areas such as Lugbe in the Federal Capital Territory (FCT), place additional strain on existing infrastructure (Akinola, 2018). Despite government and private sector interventions, the mismatch between infrastructure demand and supply remains a critical development issue. Poor infrastructure in markets and public spaces has been linked to health hazards, environmental degradation, and reduced economic competitiveness (Oyesiku, 2010).

The evaluation of existing infrastructural facilities, therefore, is not only a technical necessity but also a policy imperative. It provides the baseline data needed to design sustainable development programs, improve service delivery, and achieve global development goals such as the United Nations Sustainable Development Goal 9 (SDG 9), which emphasizes building resilient infrastructure, promoting inclusive and sustainable industrialization, and fostering innovation (United Nations, 2015).

Against this backdrop, the present study seeks to systematically assess the existing infrastructural facilities within the study area, examining their adequacy, distribution, and maintenance. The outcome will contribute to evidence-based planning, ensuring that infrastructural development aligns with the socio-economic needs of the population and promotes sustainable growth;

II. MATERIALS AND METHODS

➢ *Study Area*

Orozo is located in Abuja Municipal Area Council, FCT. It is about 12km and a 10-minute drive from the city Centre. Orozo was a traditional Gwari settlement which like most traditional settlements of the FCT underwent urban renewal (URP, FCDA, 1989). It covers an approximate area of 16.2 Sq.km. Orozo settlement is located in the south – eastern fringes of the Federal Capital Territory (FCT), Abuja, Nigeria. It is one of the emerging satellite towns that is presently accommodating both indigenous and non-indigenous. It is bounded in the north by Gidan Mangoro relocation scheme, Gidan Daya village and Gidan Daya relocation scheme, while in the South by part of Karu-Agwai hill chain whereas, in the west by a continuation of the Karu Agwai hill chain that serves as a Buffer between urban fringes that adjoin Federal Capital City (FCC) Abuja and Orozo settlement and in the east by Nasarawa State. In view of the fact that Orozo settlement is surrounded by planned areas by FCDA, there is need to upgrade the core indigenous setting.

The Site of Orozo Core indigenous settlement is in the eastern axis of Orozo Township and it is demarcated by Byadna stream in the north flowing eastward and Gidan Daya scheme, while south and west is demarcated by Nyanya-Karshi express road, and the eastern part is bounded by Nasarawa State. The site covers an approximate Area of 167.11 hectares.

The architecture of the Orozo indigenous settlement is a mixture of traditional round clay made huts and modern rectangular structures covered by Corrugated iron roofing sheets. Beside the compact residential development of the settlement, the most important components/ land marks are:

- SA-Orozoyi's Palace, within the Orozo indigenous settlement,
- The public primary and junior secondary schools with class rooms blocks planned and developed,
- Religious Institutions: Churches, Mosque,
- Police post,
- Primary health care,
- Private Clinics,
- Private schools,
- Grade 1 Area Court,
- Public utilities – Boreholes, public toilets, transformers, Drainages and waste disposer sites
- Road types,
- At the central part of the settlement there is a market along Nyanya-Karshi express way Almost all the buildings around the express way are commercial and few elements of recreation. Towards the eastern part of the settlement is dominated by residential houses as well as North and South part of the settlement.

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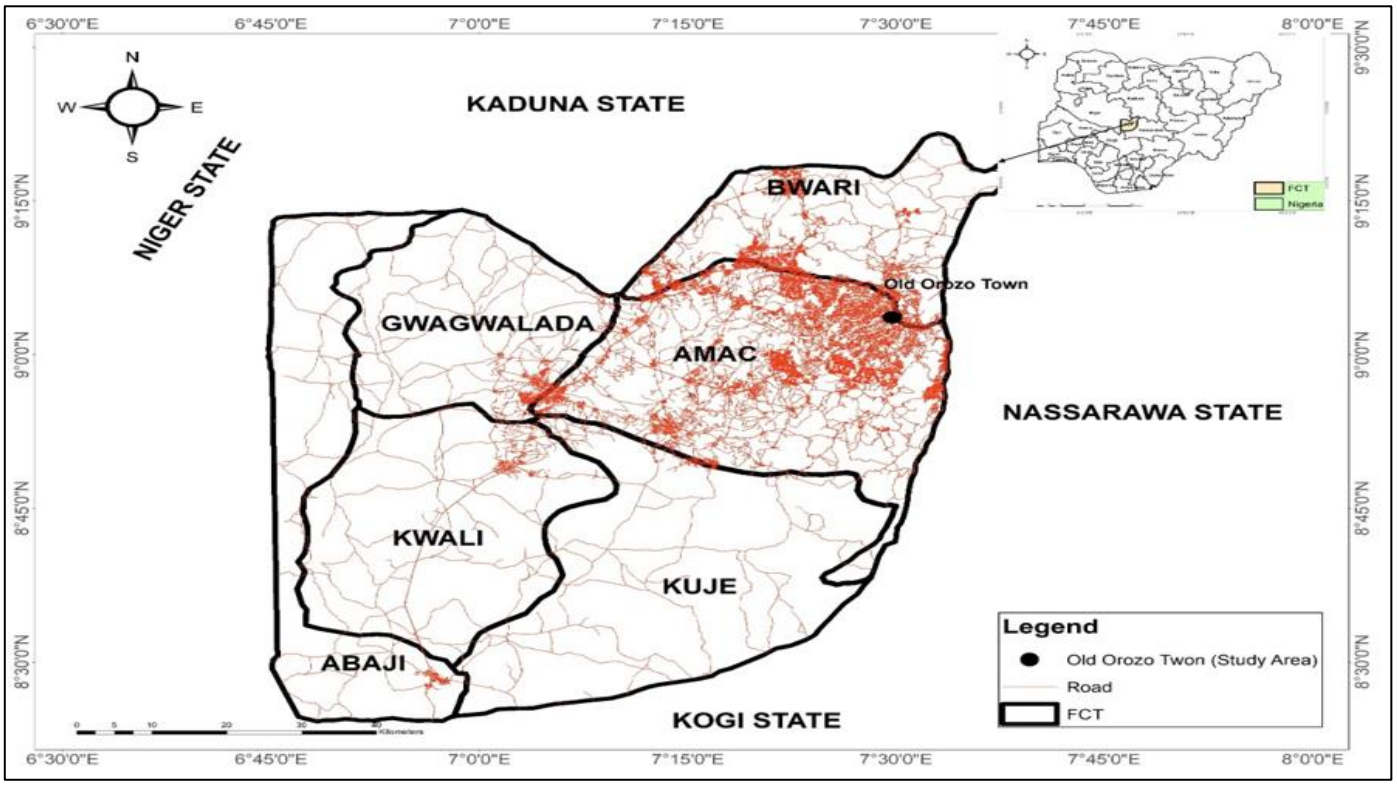

Fig 1 FCT Showing the Core-Indigenous Settlement of Orozo in Relation to FCC
Source: AGIS, 2021

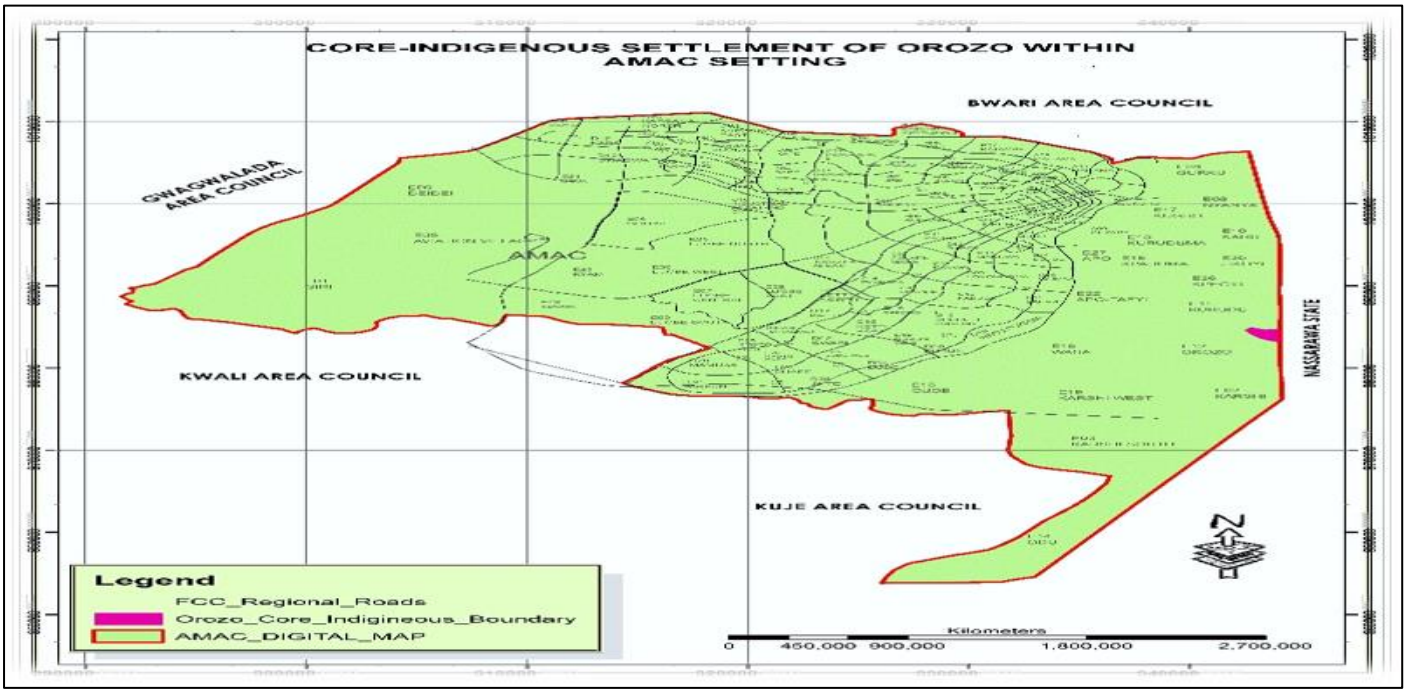

Fig 2 AMAC Showing the Project Site in its Local Context
Source: AGIS, 2021

➢ *Sampling Procedure*

The study used primary data, collected directly from the field (Kothari, 2004). This involved the use questionnaire and field observation to obtain information on the urban upgrade strategy for old Orozo Township, FCT, Abuja.

A joint site reconnaissance survey/inspection was carried out to delineate the boundaries of the study Area and acquaint self with the problems of Orozo Community. This is to acquaint self with the existing situation on ground and for proper delineation of the study site in order to assist on primary data collection, analysis and administration of questionnaire. During the reconnaissance survey in 2021,

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digitalization of the study area was done, Orozo Core Indigenous Township was delineated into five zone (5) and then the housing unit was collected in each zone, the total housing unit in the study area is 63,070. (FCDA/AGIS).

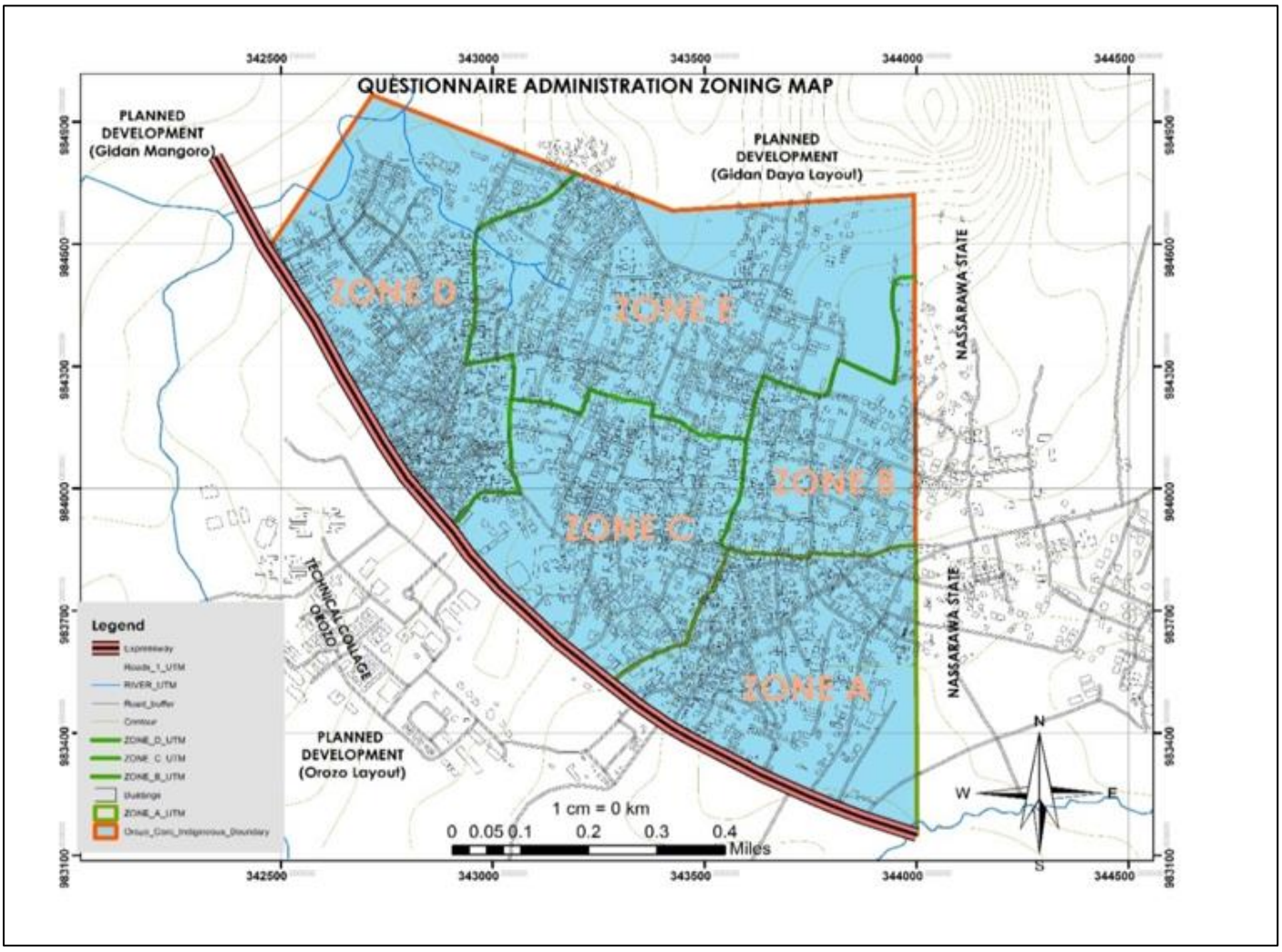

Fig 3 Questionnaire Administrative Zooning Map
Source: STDD/FCDA, 2021

Sampling size was derive using Krejcie and Morgan (1970). The sample size of housing unit of 63,070 on Krejcie and Morgan table is 380.

Table 1 Sampling Size of the Study Area

Zones	No of housing Units	Sample Size
Zone A	16,027	96
Zone B	13,161	79
Zone C	10,542	64
Zone D	12,998	78
Zone E	10, 342	63
Total	**63,070**	**380**

Source: FCDA/AGIS, (2021)

Simple random sampling was adopted in selecting the first respondent and systematic sampling was employed in selecting the subsequent ones at an interval of 158. Random numbers were generated from Microsoft excel and tabulated on the table of random numbers; respondent that fall on the random numbers were administered questionnaire. Data collected were analyzed by the use of Statistical Package for Social Sciences (SPSS) version 10.1.

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III. RESULTS AND DISCUSSION

➢ *Existing Infrastructural Facilities in Housing of the Study Area*

Table 1, shows that highest percentage of housing units in Zone A, B, C, D and E (50%, 60%, 49%, 51% and 55%) respectively indicated that pit latrine served as the commonest method of sewage disposal in the study area.

- *Sewage Disposal*

Table 1 Sewage Disposal Methods in the Study Area

	S/N	Zone A		Zone B		Zone C		Zone D		Zone E	
Method Of Sewage Disposal		Frequencies	(%)	Frequencies	(%)	Frequencies	(%)	Frequencies	(%)	Frequencies	(%)
	Pit Latrine	48	50	48	60	31	49	42	51	35	55
	Septic Tank On-Site System)	10	11	11	15	6	9	10	13	11	19
	Central Network (Water System)	0	0	0	0	5	8	8	10	9	14
	Nearby Bush	38	39	20	25	22	34	20	26	8	12
	Total	96	100	79	100	64	100	78	100	63	100

Source: Field survey, 2021

➢ *Water Supply*

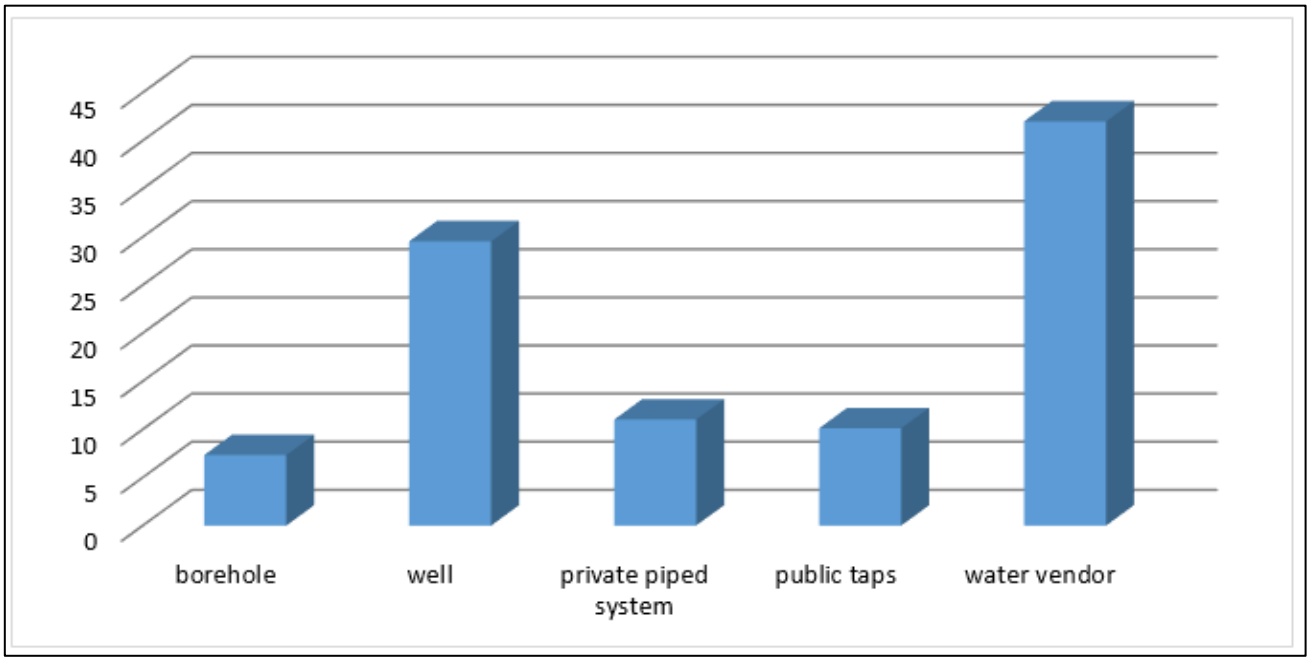

Fig 4 Proportion of Water Accessibility in the Study Area
Source: Field survey, 2021

Figure 4, shows that 42% of water provision in the study area is through water vendor popularly known as Meruwa, 29.54% through well, 11.02% through private piped system, 10.11% through public taps and 7.33% through borehole.

➢ *Drainage Facilities*

The findings showed that facilities for storm drainage exist only along the tarred major roads, that is the dual carriageway Nyanya-Karshi Road. The road drainage channels have been frequently blocked with domestic refuse and garbage indiscriminately dumped into the channels. Some of the drainage channel have poor gradients and are unable to channel wastes effectively. Incidences of blocked channels and stagnant waste water therefore, abound with attendant filth and stench (Plate 1).

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Plate 1: Typical Drainage Pattern within the Settlement of Orozo Township
Source: Field survey, 2021

➢ *Electricity Supply*

Nearly all the houses (99.79%) are connected to the electricity supply network of the Power Holding Company of Nigeria (PHCN). Only 10 houses (0.21%) were found without electricity service connection. 94.0% of the respondents opined that power supply from the PHCN is epileptic and poor. There are 4 Electricity Transformers in the Orozo Core Indigenous Township (plate.2).

Plate 2: Transformer Station within the Settlement of Orozo Township
Source: Field Survey, 2021

➢ *Refuse Disposal*

Table 2, shows that highest percentage of housing units in Zone A, B, C, D and E (57%, 53%, 54%, 51% and 37%) respectively indicated that open dumping is the commonest method of waste disposal in the study area.

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Table 2 Refuse Disposal Methods

	S/N	Zone A		Zone B		Zone C		Zone D		Zone E	
Method Of Refuse Disposal		Frequencies	(%)	Frequencies	(%)	Frequencies	(%)	Frequencies	(%)	Frequencies	(%)
	On Ground/Open Dump	56	57	43	53	35	54	41	51	23	37
	Refuse collection Bin	11	12	7	10	12	19	15	20	9	14
	Take to Designated Collection Point	21	11	26	32	17	27	23	29	20	32
	Others (Burning etc)	8	9	3	5	0	0	0	0	11	17
	Total	96	100	79	100	64	100	78	100	63	100

Source: Field survey 2021

➢ *Traffic and Transportation Network*

Transportation is an important social infrastructural element on which economic development depends. Its need is derived from the demand for the movement of goods, services and passengers. As earlier noted, the project site has no single good road except Nyanya-Karshi dual carriageway that traverse and bound the township. These include Nyanya-Karshi road, Chief Palace Road and a host of other named/unnamed roads, streets and lanes.

Plate 3: Mode of transportation in Orozo.
Source: Field Survey, 2021

➢ *Test of Hypothesis*

H01: There is no significance variation within the housing condition of the five zones within ozoro town.

Table 4 Paired Sample Test for hypothesis two

Groups	Count	Sum	Average	Variance		
ZONE A	29	707	24.37931	682.0296		
ZONE B	29	581	20.03448	480.1059		
ZONE C	29	469	16.17241	277.5764		
ZONE D	29	574	19.7931	427.0985		
ZONE E	29	455	15.68966	253.436		
ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	1431.476	4	357.869	0.843933	0.499581	2.436317
Within Groups	59366.9	140	424.0493			

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Total	60798.37	144				

From the analysis, the F-calculated is 2.43 while the table value at α=0.05 is 0.499. It then means that since the calculated value of 2.43 is higher than the table value 0.499, therefore the hypothesis is rejected, we therefore concluded that there is significance variation within the housing condition of the five zones within ozoro town. This implies that some zones housing condition are better than some zones, based on the result zone A recorded a better housing condition compared to other zones.

➢ *Discussion of Results*

Evaluating the available infrastructures in the study area shows that the study lacks portable water supply and have to depend on water from vendor popularly known has mai-ruwa. The result conforms to finding by Omotoso and Akanbi (2018) where slum area resident relied on water from private business. Also, the study area lacks modern sewage disposal and majorly used pit latrine and nearby bushes, lack appropriate drainage facilities, refuge disposal, poor road infrastructures as major road is untarred. The findings are in line with those made by Lawanson (2006), who believes that other issues facing Nigerian cities and towns include poor water supply and sanitation, unplanned urban growth and a rising susceptibility to disaster, inappropriate land use, unstable land tenure, rising traffic congestion, rising pollution, and a lack of green space. Access to an excreta disposal facility (sanitary toilet) is a fundamental human right of everyone and the primary indicator of sustainable development. The study area is plagued by air pollution from open defecation and is likely to face water and soil pollution from the washing down of water during rainfall and the disintegrations of feces on the soil (Kilakime *et al.,* 2015). The accessibility and caliber of this facility have significant effects on the standard of the living situation.

The study area is dominated with the Gbagyi's who are known for rectangular in shape houses but the granaries are circular in shape. Each household in the study area is made up of a compound which consists of houses arranged around courtyard. Each compound had iron roof covered on rectangular huts rooms which are spread around common spaces or courtyards

The present conditions of the study area show that Core Indigenous Township of the study area is most especially in the core indigenous areas of Orozo is to say the least, unsatisfactory. With many of the houses having no vehicular access, lack of potable water, lack of drainage facilities, widespread indiscriminate refuse and garbage dumps and pollution of the stream banks and courses by garbage and human faeces, the housing environment is generally unsightly, unhygienic, stench, polluted and disease-prone. The housing environment cries for upgrade; this is evident in the survey by which 100% of the resident heads of households craved for improvement in their housing environment. The finding agrees with Adebisi (2020) from their observation and analysis of the Osun case, urban poor, though more inconvenienced with structural changes, also appreciates and values the social, economic and infrastructural advantages of urban renewal.

The study also suggested that redevelopment be used as the proper upgrading means and policies to improve the physical state of the indigenous village of orozo and the level of living of its residents. These were concentrated on public infrastructure, traffic and transportation system, water supply, electricity supply, sewerage, storm water drainage, solid waste management, community facilities, educational facilities, health facilities, recreation and entertainment facilities, socio-cultural facilities, library, places of worship, cemeteries, post office, fire department, and area court. Many household occupants have refused to allow the demolition of their homes because they believe their house has a connection to their ancestors, despite the fact that the people are not being included in the process, which has led to many issues, this is in consonance with finding by Olukoya, *et al,* (2012).

IV. CONCLUSION AND RECOMMENDATION

The study looked into existing infrastructural facilities for slum upgrading plan and measures of old Orozo Township, Federal Capital Territory, Nigeria. Only four (4) of the eleven studied infrastructures those for government institutions, healthcare and telecommunications were adequate, according to the results. When the urban regeneration initiatives in the study area were evaluated, it was evident that only four (4) of them the establishment of institutions for government, health care, education and telecommunications could be deemed to have been successful. However, if residents are involved and it is properly implemented, the urban upgrade policies in place still offer some optimism for the future of urban regeneration initiatives in the study area.

Therefore, it is appropriate to suggest some policy ideas that, if put into practice, would offer some optimism for the future of urban renewal initiatives in the former Orozo Township, FCT, Abuja. It is advised to take the following policy factors into account:

- Public-private initiatives and participatory methods should be implemented in the old Orozo Township, FCT, Abuja, as urban renewal process.
- Urban Upgrade programs ought to be inclusive of all community segments in order to promote economic growth and sustain an environment that is both aesthetically pleasing and healthful.
- Government should embark on the provision of inventories of housing stocks in the study area for participatory upgrading and maintenance with owners and inheritors of such properties. Maintenance, reuse and upgrading of such properties can be encouraged through property tax rebates and other incentives.
- New markets and economic clusters in the community should be more inclusive through the adoption of existing traders' networks and cooperatives in the development of proposed markets, shopping complexes and malls not just

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by mere speculation or the use of private developers. The inclusion of these people facilitates their individual and collective engagements and resources and ensures a more sustainable development.

- Incentives and infrastructures to enable people who wish to embark on housing development in places within communities other than the capital city should be encouraged and facilitated in appropriate area of the community. Adequate publicity should be given to these measures even before they are embarked upon especially through extensive consultations with residents and citizens of the community.

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