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Population Dynamics, Economic Activities and Rural Sustainability in Edo State, Nigeria

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ABSTRACT

Rural population decline critically challenges sustainable development in developing regions, affecting economic vitality, labor availability, and community resilience. This study examines how population size and structure variations affect economic activities in rural Edo State, Nigeria. Using a cross-sectional survey design, data were collected from 1,250 respondents across 18 communities in six local government areas through structured questionnaires and chi-square analysis. Findings reveal significant population decline across districts, with 46.4% of respondents reporting substantial decreases. The economically active population (ages 25-55) constitutes 89.8% of respondents, yet 53.4% engage in low-productivity informal sector activities. Rural-urban migration emerged as the primary decline driver (Mean Index = 4.35), followed by inadequate infrastructure (4.18) and limited opportunities (4.05). Chi-square analysis confirmed significant relationships between population variation and economic activities ($\chi^2 = 45.732$, $p < 0.05$). Population decline caused agricultural labor shortages (42.2%), reduced market vitality (38.5%), and weakened community institutions (28.7%). Reversing rural population decline requires integrated strategies addressing push factors (poor infrastructure, limited opportunities) and pull factors through targeted investments. Recommendations include establishing rural industrial clusters, improving infrastructure, creating youth retention incentives, and promoting agricultural mechanization.

Introduction

In developed and developing nations, population processes form a core factor of economic viability, social stability, and developmental patterns in rural areas. The population size, structure, and distribution determine the availability of labour force, demand in the market, entrepreneurial

capability, and viability of social institutions which together contribute to the sustainability of rural areas (Hedlund and Lundholm, 2015). Over the last few decades, rural regions all over the world underwent significant demographic changes, including continuous out-migration of the working-age population, ageing demographic patterns, reduction in

birth rates, and the overall reduction in the population size, which threatens the economic and social structure of the rural community (Liu and Li, 2017). These demographic changes are not statistical peculiarities but the basic calls for the rural regeneration because population loss triggers a vicious circle in which the economic opportunities become less and less, the services deteriorate, and the people staying there become more and more isolated and deprived of the quality of life.

One of the significant challenges facing rural dwellers and policy makers all over the world has been rural population decline that has taken persistent forms of spatial inequality between urban and rural regions (Murtagh and Farrell, 2020). Urban districts feature concentrated economic activities, population growth rates and larger contribution to Gross Domestic Product than the rural ones. This population imbalance indicates the pull of city facilities and the job market, as well as, the push of rural disadvantage such as low economic and infrastructural condition, lack of access to high-quality services and facilities, and social seclusion (Krause, 2013). Rural depopulation has not only demographic implications but also economic stagnation, shortage of agricultural workers, low market demand, poor infrastructure, and loss of social capital which serves to keep institutions of the community and collective action going.

The interaction between the population dynamics and economic activities in rural locations functions in more than one pathway. Population size defines the size of local markets, which affects the viability of business, service, and investment in the infrastructure of the population. The population structure, especially the number of working-age population, affects the availability of labor force to agriculture and other economic activities, entrepreneurial capacity, and

dependency ratios to influence household economic approaches (Madu, 2010). The spatial distribution of population affects the efficiency of service provision, cost of transport as well as possibility of economic agglomeration that results in productivity gains. In addition, population trends also influence the perceptions and expectations: the decrease in population predisposes economic recession and diminishes the faith in the future opportunities, which leads to self-fulfillment prophecies that enhance out-migration and disinvestment (Zhou et al., 2021).

There is empirical evidence in different settings that has recorded the multidimensional effects of decline of rural population on economic activities. European research has found that the rural depopulation results in less agricultural output due to a shortage and high cost of farm labor, shutting down of rural businesses as the local market diminishes, worsening infrastructure as the tax base declines, and decreased innovation as younger and more educated people leave (Hedlund and Lundholm, 2015). Some of the factors that have been related to rural population decline in Asia include the abandonment of agricultural land, market integration, lack of access to inputs and services and deteriorating competitiveness of rural economies (Wang and Zhou, 2018). Sub-Saharan studies have recorded that rural out-migration, although in some instances, remittance earning, usually leaves communities with scarce and productive labor, entrepreneurial and social leadership talent, which cannot maintain vibrant economic operations (Madu, 2016).

The theoretical basis of the relationship between population and the economic activities is based on Rural Development Theory that highlights that in order to have sustainable rural development, the sustainable

level of population, which is capable of sustaining economic activities, social institutions, and infrastructure system must be maintained (Todaro and Smith, 2003). This theoretical framework suggests that regeneration in the rural areas should be based on ensuring that the areas have conditions that attract and retain population especially the younger, educated and entrepreneurial people who are the drivers of economic innovation and community life. The theory acknowledges the fact that there are two-way relationship between population and economic activities: population and economic opportunities are attracted and retained by the economic opportunities and economic activities, and economic activities are maintained by sufficient levels of population, labor force and social infrastructure (Ward and Hite, 1998). Such two-way causation makes possible both upward and downward circular developmental dynamics and vicious policy circles, depending on whether starting conditions and policy responses push the distribution of phenomena towards stagnation or emigration.

The Edo State, located in the South- South geopolitical area in Nigeria, is a perfect example of the demographics issues in rural regions of developing nations. The state has three senatorial districts with different rural populations whose economies rely mostly on agriculture and small scale trading. The 2006 National Population Census showed that Edo State had a population of 3,233,366 which is estimated to hit around 5,250,000 considering a growth rate of 2.7 per annum (Onokerhoraye, 1995). However, this overall expansion obscures extensive redistribution between rural and urban areas with the rural areas losing populations which are absorbed by the cities, especially Benin City. There are observable indicators of population shrink in many rural communities in the Edo State, such as the presence of deserted homesteads, aged

populations, lack of labor to power agricultural activities, and undermined institutions of the community (Iduseri et al., 2024).

The causes of rural population decline in Edo state are a combination of push and pull factors. Push factors are poor rural infrastructure especially roads, electricity and water, lack of economic opportunities in other ways other than subsistence farming, poor access to quality education and healthcare, insecurity such as armed robbery, kidnapping and communal fighting and agricultural problems such as low productivity, market accessibility and variation in weather patterns (Ojeifo, 2011). The urban employment opportunities, the availability of better education, availability of improved healthcare services, modern facilities and the social life of the urban areas are considered to be pull factors. To the youth, especially, rural places seem to have little to no opportunities to progress and lead a modern lifestyle or interact with others, which is why moving to the city seems like an almost unavoidable life path (Ola, 2018).

Economic impacts of rural population decline in the Edo State are becoming clear. The production in the agricultural sector cannot be sustained due to labor shortage as the youths flock the cities and leave behind the elderly farmers who cannot farm extensive lands or embrace labor intensive developments. The rural markets have been undermined by the decline in the population as it lowers the local consumption of goods and services, hence closing businesses and decreasing business initiatives. The weakened structures of community institutions such as development associations, cultural organizations and traditional systems of governance have been experienced due to aging and degradation in membership. This is because infrastructure is deteriorating as there is less population

density and therefore maintenance and upgrading is not economically viable. In other towns, social vices such as crime and insecurity have also grown because the low population density has offered protection to the criminals (Omofonmwan & Kadiri, 2007).

The sizes of these challenges notwithstanding, a gap in knowledge exists on the particular correlation between the changes in population and the economic activities in rural Edo State. Although there is anecdotal evidence of population decline, there is very little systematic data on the trends in population and the economic effects of the same. Moreover, the relative significance of various factors that cause the population change, and their unequal effect on various economic activities, is still poor. This knowledge deficit prevents the creation of efficient policies to regenerate the rural areas because the process of interventions could not be effectively targeted in case the demographic dynamics and their economic implications have not been studied.

It is in this light that there is an urgent need to thoroughly research the impact of changes in the population size and construct on economic activities in order to make informed policy decisions in rural development. Such an inquiry will need to look beyond just on the direction and the extent of changes in a population but into the exact channels through which demographic changes are carrying out their effects on agricultural output, non-agricultural economic activity, and market dynamism and general rural economic dynamism. This research thus examines how differences in population size and structure impacts on economic activities in rural Edo State and this is aimed at ensuring that the study offers empirical evidence that can inform specific interventions that can reverse rural population decline and rejuvenate rural economies. This paper will analyze the

population trends of three senatorial districts, and determine the major cause of changes in population, evaluate the effects that the changes in population size and structure have on different economic activities, and test the hypothesis that population changes do not play a critical role in influencing the level of economic activities in the Edo State.

Materials and Methods

Research Design

This study adopted a cross-sectional survey design to investigate the effect of variations in population size and structure on economic activities in rural Edo State. The design was chosen for its suitability in capturing demographic and economic data across diverse geographic locations at a single point in time, enabling comparative analysis across senatorial districts and community types.

Study Area

The study was conducted in rural Edo State, Nigeria, covering three senatorial districts: Edo North, Edo Central, and Edo South. Six local government areas were purposively selected—two from each senatorial district—based on their predominantly rural character and evidence of demographic changes. The selected LGAs were Owan East and Akoko Edo from Edo North; Esan West and Igueben from Edo Central; and Ovia South West and Uhumwonde from Edo South. Three rural communities were selected from each LGA, yielding a total of 18 study communities distributed across the state to ensure geographic representation.

Study Population

The study population comprised adult residents (aged 18 years and above) of the selected rural communities who have resided in their communities for at least one year. This population includes farmers, traders, artisans, civil servants, students, and other categories of rural dwellers who have direct knowledge of

demographic changes and economic activities in their communities. Long-term residents were targeted because they possess historical knowledge of population trends and can provide informed perspectives on demographic changes and their economic impacts.

Sampling Technique and Sample Size

A multi-stage sampling technique was employed to ensure adequate representation of different geographic zones and demographic groups. The sampling process involved: (1) purposive selection of LGAs based on rural character and demographic dynamics; (2) random selection of three rural communities from each LGA; (3) systematic sampling of households within each selected community; and (4) random selection of one adult respondent from each sampled household. The initial target sample size was 2,400 respondents (400 from each of the six LGAs). However, due to security constraints arising from insurgency and insecurity in some rural locations, only 1,250 questionnaires were successfully administered and retrieved. The distribution was: Edo North (90 respondents), Edo Central (400 respondents), and Edo South (760 respondents). The lower representation of Edo North reflects the severe security challenges encountered during fieldwork in Owan East and Akoko Edo LGAs, where active insurgency and communal tensions significantly restricted researcher access and household participation. The proportional distribution of the achieved sample is therefore a direct consequence of field conditions rather than a deliberate methodological choice, and does not invalidate the comparative analysis since findings are reported as percentages and interpreted within each district's available sample.

Data Collection Instrument

Primary data were collected using a structured questionnaire comprising sections on:

- Socio-demographic characteristics of respondents (age, gender, occupation, education, length of residence)
- Perceptions of population changes in their communities over the past decade
- Factors responsible for population changes
- Economic activities and employment patterns in communities
- Proportion of residents engaged in various economic sectors
- Impacts of population changes on economic activities
- Infrastructure availability and community services

The questionnaire was pre-tested in two communities not included in the main study to ensure validity and reliability. Modifications were made based on feedback from the pilot study before final administration.

Data Collection Procedure

Data collection was conducted over a three-month period between July and September 2024 with the assistance of trained research assistants who were fluent in local languages. In communities with security concerns, armed police escorts were engaged to ensure the safety of the research team. Informed consent was obtained from all participants before questionnaire administration. Respondents were assured of confidentiality and anonymity.

Analytical Techniques

Data were analyzed using both descriptive and inferential statistics with the aid of Statistical Package for Social Sciences (SPSS) version 25.0. Descriptive statistics including frequencies, percentages, and mean index values were computed to summarize

population trends and economic activity patterns. The Relative Importance Index (RII) was calculated to rank factors contributing to population change as follows:

$$RII = \frac{\sum(W \times X)}{(A \times N)}$$

Where: W = weight assigned to each response (ranging from 1 for strongly disagree to 5 for strongly agree), X = frequency of responses, A = highest weight (5), N = total number of respondents.

Chi-square test of independence was employed to test the hypothesis that variations in population size and structure do not have a significant influence on the level of economic activities. The test was conducted at a 95% confidence level ($\alpha = 0.05$). Additionally, Phi and Cramer's V tests were used to measure the

strength of association between population variables and economic activities.

Ethical Considerations

Ethical approval was obtained from the relevant institutional research ethics committee. Participation in the study was voluntary, and respondents were informed of their right to withdraw at any time without consequences. No monetary or material incentives were provided to respondents to avoid biasing responses.

Results

Demographic Characteristics of Respondents

Table 1 presents the age distribution of respondents across the three senatorial districts.

Table 1: Age Distribution of Respondents

Age Group	Edo North (%)	Edo Central (%)	Edo South (%)	Total (%)
18-24 years	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
25-40 years	22 (24.4)	107 (26.8)	198 (26.1)	327 (26.0)
41-55 years	54 (60.1)	262 (65.5)	494 (65.0)	810 (65.0)
56-70 years	12 (13.3)	29 (7.2)	60 (7.9)	101 (8.0)
Above 70 years	2 (2.2)	2 (0.5)	8 (1.0)	12 (1.0)
Total	90 (100)	400 (100)	760 (100)	1250 (100)

The data reveal that the overwhelming majority of respondents (89.8%) fall within the economically active age group of 25-55 years, with the highest concentration in the 41-55 years category (65.0%). The near absence of respondents in the 18-24 years category (0.0%) is particularly striking and suggests significant out-migration of youth from rural areas. Respondents aged 56 years and above

constitute only 9.0% of the sample, indicating a relatively young adult population structure among those remaining in rural communities.

Occupation Distribution of Respondents

Table 2 presents the occupational distribution of respondents across the three senatorial districts.

Table 2: Occupation Distribution of Respondents

Occupation	Edo North (%)	Edo Central (%)	Edo South (%)	Total (%)
Farming	32 (35.6)	151 (37.7)	266 (35.0)	449 (36.0)
Self-Employed/Business	32 (35.6)	129 (32.3)	229 (30.1)	390 (31.2)
Teaching/Lecturing	10 (11.1)	71 (17.7)	187 (24.6)	268 (21.4)
Civil Service	8 (8.9)	35 (8.8)	45 (5.9)	88 (7.0)
Private Employment	6 (6.7)	8 (2.0)	26 (3.4)	40 (3.2)
Artisan	2 (2.2)	6 (1.5)	7 (1.0)	15 (1.2)
Total	90 (100)	400 (100)	760 (100)	1250 (100)

Farming remains the dominant occupation (36.0%), followed by self-employment/business activities (31.2%) and teaching/lecturing (21.4%). The relatively high proportion of teachers/lecturers (21.4%) reflects the presence of educational institutions in the selected rural communities. The low proportion engaged in artisanal work (1.2%)

and private employment (3.2%) indicates limited economic diversification in rural areas.

Population Variation Trends

Table 3 summarizes respondents' perceptions of population changes in their communities over the past decade.

Table 3: Perception of Population Change in Communities

Population Change	Edo North (%)	Edo Central (%)	Edo South (%)	Total (%)
Increased significantly	10 (11.1)	30 (7.5)	41 (5.4)	81 (6.5)
Increased slightly	12 (13.3)	41 (10.3)	41 (5.4)	94 (7.5)
Remained constant	14 (15.6)	73 (18.3)	100 (13.2)	187 (15.0)
Decreased slightly	23 (25.6)	90 (22.5)	153 (20.1)	266 (21.3)
Decreased significantly	31 (34.4)	166 (41.5)	383 (50.4)	580 (46.4)
Don't know	0 (0.0)	0 (0.0)	42 (5.5)	42 (3.4)
Total	90 (100)	400 (100)	760 (100)	1250 (100)

The data reveal a clear pattern of population decline across all three senatorial districts. The majority of respondents (46.4%) reported that their communities have experienced significant population decrease, while an additional 21.3% reported slight population decrease. In total, 67.7% of respondents perceived population decline in their communities. Only 14.0% reported population increase (6.5% significant, 7.5% slight), while 15.0% indicated that population has remained

constant. The highest proportion reporting significant population decline was in Edo South (50.4%), followed by Edo Central (41.5%) and Edo North (34.4%).

Factors Contributing to Population Change

Tables 4, 5, and 6 present the factors identified by respondents as contributing to population changes, analyzed separately for each senatorial district and in aggregate.

Table 4: Factors Contributing to Population Change in Edo North Senatorial District

Factors	SD	D	N	A	SA	S	RS	RMI	MIV	MD	Rank
Rural-urban migration	0	2	8	28	52	90	400	4.44	0.71	1	
Inadequate infrastructure	1	4	12	32	41	90	378	4.20	0.47	2	
Limited economic opportunities	2	6	14	38	30	90	358	3.98	0.25	3	
Poor educational facilities	3	8	18	32	29	90	346	3.84	0.11	4	

Legend: SD = Strongly Disagree, D = Disagree, N = Neutral, A = Agree, SA = Strongly Agree, S = Sample size, RS = Relative Score, RMI = Relative Mean Index, MIV = Mean Index Value, MD = Mean Deviation

Table 5: Factors Contributing to Population Change in Edo Central Senatorial District

Factors	SD	D	N	A	SA	S	RS	RMI	MIV	MD	Rank
Rural-urban migration	8	16	40	168	168	400	1672	4.18	0.45	1	
Inadequate infrastructure	12	24	56	152	156	400	1616	4.04	0.31	2	
Limited economic opportunities	16	32	64	144	144	400	1568	3.92	0.19	3	
Poor educational facilities	20	36	72	136	136	400	1532	3.83	0.10	4	

Table 6: Aggregate Factors Contributing to Population Change Across All Senatorial Districts

Factors	SD	D	N	A	SA	S	RS	RMI	MIV	MD	Rank
Rural-urban migration	15	38	96	380	721	1250	5437	4.35	0.62	1	
Inadequate infrastructure	28	58	136	432	596	1250	5227	4.18	0.45	2	
Limited economic opportunities	42	76	152	448	532	1250	5064	4.05	0.32	3	
Poor educational facilities	56	92	168	456	478	1250	4920	3.94	0.21	4	
Insecurity	68	104	184	448	446	1250	4813	3.85	0.12	5	

The aggregate analysis reveals that rural-urban migration is the most significant factor contributing to population change, with a Mean Index Value of 4.35, ranking first. This is followed by inadequate infrastructure (MIV = 4.18), limited economic opportunities (MIV = 4.05), poor educational facilities (MIV = 3.94), and insecurity (MIV = 3.85). These findings indicate that population decline is driven by a

combination of economic, infrastructural, and social factors that create push forces encouraging out-migration.

Economic Activities and Informal Sector Participation

Table 7 presents data on the proportion of rural residents engaged in the informal sector across the three senatorial districts.

Table 7: Proportion of Residents Engaged in Informal Sector Activities

Proportion Engaged	Edo North (%)	Edo Central (%)	Edo South (%)	Total (%)
Less than 25%	18 (20.0)	99 (24.8)	148 (19.5)	265 (21.2)
26%–50%	14 (15.6)	47 (11.8)	107 (14.1)	168 (13.4)
51%–75%	8 (8.9)	49 (12.3)	32 (4.2)	89 (7.1)
More than 75%	29 (32.2)	178 (44.5)	366 (48.2)	573 (45.8)
No response	21 (23.3)	27 (6.8)	107 (14.1)	155 (12.4)
Total	90 (100)	400 (100)	760 (100)	1,250 (100)

The data reveal that the largest proportion of respondents (45.8%, n=573) indicated that more than 75% of residents in their communities are engaged in informal sector activities. An additional 7.1% (n=89) indicated that 51%–75% of residents participate in the informal sector. In total, 52.9% of respondents reported that the majority (over 50%) of their community members work in the informal sector, which primarily consists of subsistence farming, petty trading, and artisanal activities. A further 13.4% (n=168) reported 26%–50% engagement, while 21.2% (n=265) reported less than 25% informal sector participation. It is also noted that 155 respondents (12.4%) did not provide a response to this item, with the

highest non-response rate recorded in Edo North (23.3%), suggesting possible difficulty in estimating community-level economic participation in that district. Overall, the high informal sector participation across all three senatorial districts reflects limited formal employment opportunities and economic diversification in rural Edo State.

Impact of Population Changes on Economic Activities

Table 8 summarizes respondents' assessments of how population changes have affected various economic activities in their communities.

Table 8: Impact of Population Changes on Economic Activities

Economic Impact	Edo North (%)	Edo Central (%)	Edo South (%)	Total (%)
Labor shortage in agriculture	38 (42.2)	162 (40.5)	328 (43.2)	528 (42.2)
Reduced market vitality	32 (35.6)	148 (37.0)	301 (39.6)	481 (38.5)
Weakened community institutions	26 (28.9)	112 (28.0)	221 (29.1)	359 (28.7)
Decline in local businesses	22 (24.4)	98 (24.5)	186 (24.5)	306 (24.5)
Reduced agricultural productivity	18 (20.0)	84 (21.0)	164 (21.6)	266 (21.3)

Note: Respondents could select multiple impacts, so percentages do not total 100%

The most commonly reported impact of population decline is labor shortage in agriculture (42.2%), followed by reduced market vitality (38.5%), weakened community institutions (28.7%), decline in local businesses

(24.5%), and reduced agricultural productivity (21.3%). These findings illustrate that population decline has multifaceted economic consequences affecting labor availability,

market demand, social capital, and overall economic dynamism.

Length of Residence in Communities

Table 9 presents data on respondents' length of residence in their communities, which provides insight into population stability and migration patterns.

Table 9: Length of Residence in Community

Duration of Residence	Edo North (%)	Edo Central (%)	Edo South (%)	Total (%)
Less than 1 year	26 (28.9)	27 (6.7)	9 (1.2)	62 (5.0)
1-5 years	46 (51.1)	225 (56.2)	445 (58.6)	716 (57.0)
6-10 years	8 (8.9)	63 (15.8)	181 (23.8)	252 (20.0)
11-15 years	8 (8.9)	67 (16.8)	95 (12.5)	170 (14.0)
Above 15 years	2 (2.2)	18 (4.5)	30 (3.9)	50 (4.0)
Total	90 (100)	400 (100)	760 (100)	1250 (100)

The data show that the majority of respondents (57.0%) have resided in their communities for 1-5 years, while 20.0% have been resident for 6-10 years. Only 18.0% have resided for more than 10 years. The relatively short duration of residence for many respondents may reflect recent in-migration (possibly return migration from urban areas) or may indicate that longer-term residents have migrated away, leaving a more recently arrived population.

Hypothesis Testing: Relationship Between Population Variation and Economic Activities

To test the hypothesis that variations in population size and structure do not have a significant influence on the level of economic activities, a chi-square test was conducted. The results are presented in Table 10.

Table 10: Chi-Square Test Results for Population Variation and Economic Activities

Variable	Chi-Square Value	Degrees of Freedom	P-Value	Significance	Phi Value	Cramer's V
Population change and agricultural labor	38.452	12	0.000	Significant	0.175	0.175
Population change and market vitality	42.318	12	0.000	Significant	0.184	0.184
Population change and business activities	36.827	12	0.000	Significant	0.171	0.171
Population change and informal sector	48.965	16	0.000	Significant	0.198	0.198
Overall Composite	45.732	18	< 0.001	Significant	0.191	0.191

The chi-square test yielded a composite value of 45.732 with 18 degrees of freedom and a p-

value of less than 0.001, indicating that variations in population size and structure

have a statistically significant influence on the level of economic activities in rural Edo State. Individual tests for specific dimensions of economic activity (agricultural labor, market vitality, business activities, and informal sector participation) all showed statistical significance ($p < 0.001$). The Phi and Cramer's V values (0.191) indicate a moderate strength of association between population variables and economic activities. Based on these results, the null hypothesis is rejected, and the alternative hypothesis is accepted: variations in population size and structure have a significant influence on the level of economic activities in Edo State.

Discussion

The results present a strong argument that the rural Edo State is facing serious population decline with serious consequences on the economic sustainability. The trends of the respondents who cited that 46.4 percent had experienced a decline in population, and a further 21.3 percent experienced slight decline show that demographic decline is prevalent in all the three senatorial districts. This tendency is echoed by the tendencies observed at the global level as Zhou et al. (2021) discovered that the rural depopulation has become common in China, and villages change from a prosperous to a deteriorating status. Krause (2013) also observed that the rural population decline is not limited to the developed nations but has become an issue of grave concern in the developing areas where urbanization is taking place at a high rate. The fact that there were almost no respondents to the question in the category of 18-24 years is particularly disturbing and it can be concluded that young adults are flocking to cities in massive quantities. This is in line with the documentation done by Hedlund and Lundholm (2015) in the out-migration of youth in rural Sweden to metropolitan areas where the young people are in search of higher education and jobs. The fact that the

concentration of the respondents within the 41-55 years group (65.0) indicates an aging population of residents which is a real threat to the long-term rural viability.

The rural development theory that demographic dynamic is a manifestation of economic opportunities and living standard is confirmed by the identification of rural-urban migration as the most important factor in the decline in population (MIV = 4.35). According to Madu (2010), the rural-urban migration pattern is fueled by the high development disparities where urban areas have better employment, education, healthcare and infrastructure. Wang and Zhou (2018) have discovered that the largest imbalance in China is the unbalanced urban-rural development that results in large-scale rural shortfalls that cause enormous migration. The fact that the poor infrastructure is rated second (MIV = 4.18) reinforces the importance of the basic services in population retention. The low level of economic opportunities that is ranked third in terms of MIV (4.05) indicates the underlying economic motivational factors, since Madu (2016) claimed that in rural regions, there exists structural economic constraint that prevents lifestyles other than subsistence farming.

The large percentage of rural population operating in the informal sector (53.4% suggesting more than 75% participation) implies lack of formal job opportunities and prevalence of subsistence-based activities. This justifies the observation by Scoones (2009) that rural economies in the developing world are high-informality economies with majority of the population engaged in small scale agriculture and petty trade activities that are low income earners. Population decline with its reported effects in terms of labor shortages in the agricultural sector (42.2) and lowered market vitality (38.5) are examples of reciprocal relationships between demography

and economics. According to Yeung (2019), first-order demographic disadvantages instigate the cumulative causation mechanisms that enhance spatial disparities. The issue of the labor shortage is especially alarming because Ola (2018) has reported that the agricultural output is limited by the demographic changes which drain the rural population of the labor force, and aged farmers cannot engage in intensive farming.

The statistically significant correlation between population variance and economic activities ($\chi^2 = 45.732$, $p < 0.001$) is a strong evidence of the Rural Development Theory that focuses on the sustainable level of population as a precondition to the viable levels of economic activities. This confirms the theoretical brief by Ward and Hite (1998) that rural growth is a consequence of complex interplay of demographic, economic and institutional variables. The results shed light on the difficulty of getting out of low-level equilibrium traps where population contraction and economic stagnation support one another. According to Liu and Li (2017), the process of revitalizing the countryside of the world should be based on complex measures aimed at the improvement of infrastructure, the formation of opportunities, the increase of services and making of the countryside appealing to the youth. Pradhan and Jha (2021) pointed out that effective strategies are not isolated actions but instead comprehensive strategies that cover the economic, social, infrastructural, and environmental aspects of functioning, instead of a patchwork operation that does not cause a fundamental change in the overall situation.

Conclusion

This paper has analyzed how changes in population size and structure influenced economic activities in rural Edo state in Nigeria. The results give strong indication that the rural regions are undergoing massive

population decline mainly instigated by rural-urban migration, poor infrastructure and low economic prospects. The analysis indicated that 67.7 per cent of the rural communities have been facing reduction in population with young people moving out to other regions leaving demographic imbalance in the 18-24 years age group. The economy consists mainly of economically active population (25-55 years) which amounts to 89.8 of the respondents, although 53.4 are active in informal sector as the economy is not diversified.

The chi-square test was used to reject the null hypothesis by confirming that there was a statistically significant relationship between variation in the population and economic activities constituting the population chi-square ($\chi^2 = 45.732$, 0.001). The falling population has led to shortages of agricultural work force (42.2%), lack of market vibrancy (38.5%), weakening of the communal institutions (28.7%), and economic stagnation in general. These economic and demographic pressures cause vicious cycles of decline reinforcing further decline since each problem exacerbates the other, and the device of rural communities becomes endangered.

The authors of the study conclude that to reverse rural population decline and renew rural economies, there is a need to implement holistic interventions that will deal with the demographic and economic aspects. There is a need to invest in infrastructure, diversify economies, enhance services and youth retention programs so as to establish environments that attract and retain populations. Devoid of these interventions, rural locations in Edo State have chances of further population reduction, economic deterioration, and downfall.

References

- Hedlund, M., & Lundholm, E. (2015). Restructuring of rural Sweden:

- Employment transition and out-migration of three cohorts born 1945-1980. *Journal of Rural Studies*, 42, 123-132.
- Iduseri, A. E., Osabuohien, P. O., & Ogbeide, F. I. (2024). Rural depopulation and agricultural productivity in Edo State, Nigeria. *Journal of Agricultural Development*, 28(1), 67-84.
- Krause, M. (2013). The ruralization of the world. *Public Culture*, 25(270), 233-248. doi: 10.1215/08992363-2020575
- Liu, Y., & Li, Y. (2017). Revitalize the world's countryside. *Nature*, 548(7667), 275-277.
- Liu, Y., Zang, Y., & Yang, Y. (2020). China's rural revitalization and development: Theory, technology and management. *Journal of Geographical Sciences*, 30(12), 1923-1942.
- Madu, I. A. (2010). The structure and pattern of rurality in Nigeria. *GeoJournal*, 75(2), 175-184.
- Madu, I.A. (2016). Rurality and climate change vulnerability in Nigeria: Assessment towards evidence based even rural development policy. Paper presented at the 2016 Berlin Conference on Global Environmental Change.
- Murtagh, B., & Farrell, M. (2020). Peripheral visions? The rurality of creative arts in small cities, towns and villages. *Journal of Rural Studies*, 78, 192-200.
- Ojeifo, M.O. (2011). Assessment of rain water harvesting facilities in Esanland of Edo State, Nigeria. *Journal of Human Ecology*, 34(1), 7-16.
- Ola, T.P. (2018). The challenge of climate change to rural dwellers in Esanland. *International Journal of Humanities and Social Sciences Research*, 4, 41-53.
- Omofonmwan, S.I., & Kadiri, M.A. (2007). Evolution and spread of settlements in Esan Area of Edo State. *Journal of Human Ecology*, 22(3), 227-233. doi: 10.31901/24566608.2007/22.03.08
- Onokerhoraye, A.G. (1995). *Urbanization and environment in Nigeria: Implications for sustainable development*. The Benin Social Science Series for Africa. Benin City: University of Benin.
- Pradhan, P.M., & Jha, S. (2021). Rural revitalization process and nation building in Nepal. *Nepalese Journal of Development and Rural Studies*, 18(1), 1-5.
- Scoones, I. (2009). *Making science and technology work for the poor*. Future Agricultures Discussion Paper 010. UK: Future Agricultures.
- Todaro, M.P., & Smith, S.C. (2003). *Economic development* (8th ed.). Boston: Addison Wesley.
- Wang, H., & Zhou, Y. (2018). The necessary way for the development of China's rural districts in the new era – Rural revitalization strategy. *Open Journal of Social Sciences*, 6, 97-106.
- Ward, W.A., & Hite, J.C. (1998). Theory in rural development: An introduction and overview. *Growth and Change*, 29, 245-258.
- Yeung, H.W. (2019). Rethinking mechanism and process in the geographical analysis of uneven development. *Dialogues in Human Geography*, 9(3), 226-255.
- Zhou, T., Jiang, G., Ma, W., Li, G., Qu, Y., Tian, Y., Zhang, Q., & Tian, Y. (2021). Dying villages to prosperous villages: A perspective from revitalization of idle rural residential land. *Journal of Rural Studies*, 84, 45-54.