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Navigating Urban Deprivation in Nigeria: Evidence from Lagos-Ogun Border Conurbation and Implications for Ecological Civilization

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ABSTRACT: Understanding how residents experience living conditions is essential for reducing inequality and advancing more sustainable cities. This study assessed multidimensional urban deprivation in border settlements forming the Lagos–Ogun conurbation, with the aim of generating evidence to improve living conditions and service delivery in the study area. Systematic sampling was used to select eligible respondents (n = 325). Residents rated the importance of, and satisfaction with, key settlement attributes, from which the Residents' Importance Attached Index (RIAI) and Residents' Satisfaction Derived Index (RSDI) were computed. Facility conditions were assessed using a Facility Condition Index (FCI). Findings show pronounced gaps between what residents consider important and what they experience in practice across physical, social, and economic domains, indicating multidimensional deprivation in both states' border settlements. Facility condition ratings further indicate that many basic services and public facilities are in poor condition, reinforcing deprivation. The paper recommends a coordinated Lagos–Ogun border service strategy that prioritizes rehabilitation and maintenance of critical infrastructure, strengthens development control and service accountability across jurisdictions, and leverages well-regulated public–private partnerships to expand and sustain service provision.

Keywords: Urban deprivation; Border settlements; Neighbourhood; Facilities; Ecological civilization; Lagos-Ogun conurbation

1. Introduction

Cities in many developing contexts are expanding faster than the capacity of institutions to provide basic services and manage land development [1,2]. As a result, spatial inequality deepens, producing neighborhoods that experience persistent deficits in infrastructure, services, and environmental quality [3,4]. This inequality is expressed in the gaps in access to necessities of life by different urban residents [5,6]. This pattern, often described as urban deprivation, manifests in unequal access to necessities such as water, sanitation, electricity, safe mobility, health care, and education [7].

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According to Herbert [8], urban deprivation describes conditions in which a community's standard of living falls markedly below that of others within the same urban system, reflecting hardship, limited access to resources, and under-provision of public goods. In practical terms, it is experienced as dissatisfaction with services and environmental conditions that ought to be delivered through public institutions. Because deprivation is multidimensional, its assessment requires attention to physical infrastructure, social services, environmental quality, and livelihood conditions [9]. While preferences for living in neighbourhoods vary between individuals and households due to diverse needs and lifestyles, some common values among people always result in some neighbourhoods being appreciated more highly while others are very unattractive.

A series of indicators of different dimensions have been developed in different studies to measure urban deprivation [7,10–13]. The first dimension is access to physical infrastructure. These include water supply, sanitation, electricity, drainage systems, and roads. The second dimension is the quality of the living environment. This has to do with solid waste collection, visual quality of the environment, housing conditions, the area covered by informal settlements, lack of access roads, level of incidences of crime, and average persons per household as indicators of overcrowding. Human resource capital is the third dimension. This comprises indicators such as average income, employment status, and literacy levels. The last dimension is access to social infrastructure such as health, education, and marketplaces. These dimensions can be understood as the physical, social, and economic attributes of the settlements under study for urban deprivation.

In Nigeria, the dynamics of city growth have been accompanied by enormous deficiencies in the availability of modern basic amenities such as potable water, hospitals, roads, and electricity, among others [9,14]. It is established that the pattern of allocation of government resources in neighbourhoods in the country comes with a huge bias, thereby creating myriads of urban problems [15]. The failure of the government to properly address the problem of infrastructure has led to the adoption of self-help strategies by the people through collective action, mutual agreements, and shared understanding to provide public amenities that directly affect people's lives [7,16]. Yet, urban deprivation is pronounced in some areas of Nigerian urban centres, and it affects people's quality of living [17,18].

The study of Cecilia et al. [19] established that deprived urban areas are usually excluded from functioning urban life. As established by Olatunji [7], urban deprivation manifests in both rural and urban areas of Nigerian cities, though it varies in magnitude, dimension, and intensity. The variations in the levels of unmet needs of individuals in cities affect their quality of life and enable them in or prevent them from participating in programs aimed at the attainment of societal goals such as environmental sanitation legislation, improved waste management practices, management of public spaces and utilities, taxation, among other [20,21]. The inability of the Nigerian government to adequately improve people's living conditions has manifested in various forms of deprivation, including pollution, poor environmental sanitation, poor water quality, poor housing, increased traffic, and a higher crime rate, among others. One of the areas where urban deprivation is more felt in Nigeria is in border settlements.

Border settlements exist physically between defined entities of nations, regions, states, and local areas. According to Taubenbock et al [22], borders exist at both national and international levels. Border settlements are towns close to the boundary between two countries, states, or regions. In the urban context, they are settlements that result from the spatial outward expansion of a metropolitan state and annexation of settlements along the border areas of the nearby states [23–25]. These settlements are found towards the city outskirts and beyond, characterized and seen to attract the less-poor family households [26]. In Nigeria, border settlements are increasing and urbanizing rapidly due to the uncontrolled growth of cities, high cost of living, and inadequate access to land and housing at the city centre, weak development control, among others [27]. As such, these settlements are characterized by urban ills, exclusion from the parent city, infrastructural neglect, land of political estrangement, and places of poor revenue generation. Also, the

governments of boundary states defer responsibility for providing adequate infrastructure in these areas because of the existing conurbations, which have made state boundaries indistinguishable.

From an ecological civilization perspective, deprivation in border settlements is not only a service delivery gap; it is also an environmental justice and sustainability challenge [28,29]. When basic services (water, sanitation, drainage, electricity, mobility, health, and education) are inadequate, households absorb higher environmental and health burdens through exposure to flooding, polluted environments, unsafe mobility, and lost time and productivity [23,30]. Reducing these burdens through inclusive service access is therefore central to ecological civilization outcomes that combine human well-being with ecological integrity.

Border conurbations also test the governance dimension of ecological civilization, where metropolitan growth crosses administrative boundaries, fragmented mandates can create 'responsibility gaps' in planning, infrastructure investment, and maintenance [7]. Coordinated land use management, resilient infrastructure, and interjurisdictional service agreements are thus critical to ensure that rapidly urbanizing border areas are integrated into functioning urban life rather than excluded from it.

Studies abound on urban deprivation. Such works include issues on spatial inequalities in infrastructural development [4,16], patterns of socioeconomic deprivation and its impact on quality of life [18], coping with infrastructural deprivation through collective action [16,31,32], measuring socioeconomic outcomes using a general deprivation index [10], and the role of spatial information in addressing urban inequality [33]. While the focus of each of these studies differs, prominent identified issues of urban deprivation tend to show similar problems, which include a higher incidence of social problems such as crime and health problems, low or absence of infrastructural facilities, and poor quality of living environment in understanding deprived areas. However, these studies did not cover those deprived areas directly linked to border settlements.

Studies that have examined environmental concerns around border settlements in Nigeria include those of Oladehinde et al., [27,34], Ojo [13], and Lawanson [35]. Ojo [13] examined residents' quality of life in Seme border settlements, Nigeria. The study established that environmental amenities were inadequate, and these inadequacies had negative impacts on inhabitant's quality of life. This study differs from Ojo [13], who focused on international border settlements, which are mainly scattered along the boundary between Nigeria and the Republic of Benin. This study examined urban deprivation in border settlements forming a conurbation between two states in Nigeria. Also, Lawanson et al. [35] focused on environmental challenges faced by peri-urban settlements in the Lagos State megacity. The study revealed that the proximity of Lagos State, as a megacity, negatively affects environmental quality in settlements; however, the issues considered are not broad enough to measure urban deprivation. The studies of Oladehinde et al. [27,34] focused on drivers and challenges of land accessibility and their influence on livelihoods in rural border communities in Nigeria. This study differs from Oladehinde's in that it focuses on border settlements in urban areas, which differ from rural areas in terms of outlook, settlement patterns, residents' socioeconomic characteristics, land uses, and basis for residence.

Thus, this study aims to assess urban deprivation in border settlements of Lagos and Ogun States using the physical, social, and economic attributes and conditions of facilities as criteria to measure dimensions of urban deprivation. To achieve this, it assessed the socioeconomic characteristics of residents in border settlements, the importance and satisfaction they derived from their neighbourhood's physical, social, and economic attributes and the condition of facilities as measures of the dimensions of urban deprivation.

2. Materials and Method

2.1. The Study Area

The study area consists of the border settlements of Lagos and Ogun states which have formed extensive conurbation.

2.1.1. Lagos State

Lagos State is one of the key inland ports in West Africa and the economic hub of Nigeria. The state accounts for 26.7% of Nigeria's total GDP and more than 50% of non-oil GDP [36]. Over 50% of Nigeria's non-oil industrial capacity is in Lagos State [36,37]. Lagos State is the 19th most populated urban agglomeration in the world, with more than 20 million inhabitants, and it is growing 10 times faster than New York [38]. According to the Lagos State [39] , the state's growth rate is 3.2%, and the estimated population as of 2019 is 26 million. The state has been ranked 171 out of 172 countries in the list of most liveable cities in the world [40]. Due to high population growth, Lagos State is growing in every direction. The metropolitan area covers about 16 of the 20 Local Government Areas (LGAs) in the state and impinges on four local government areas of neighbouring Ogun State. The local government areas along the border of Lagos State include Alimosho, Ifako-Ijaiye, Ikeja, Kosofe, and Ikorodu LGAs, which together account for 30% of the State's population [39]. LGAs with these extensive conurbations identified in the scope of the study are Alimosho and Ifako-Ijaiye LGAs.

2.1.2. Ogun State

Ogun State covers about 1.8% of Nigeria's total land area [41]. The state connects Lagos State with the southwest region and other parts of the country. As of 2017, the estimated population of Ogun Stat was 5.2 million, but the actual population, when adjusted for migration from neighbouring Lagos State, is 7.2 million [42]. Majority of the Ogun state population, about 55 percent, is rural, but the share of the urban population (currently at 45 percent) is increasing rapidly [7,34]. The proximity of the state to the seaport and airport, coupled with the spillover of people and firms moving out of Lagos State due to congestion and high real estate costs, has made it the fastest-growing residential, commercial, and industrial hub in the country. The state is home to several industrial centres, including one of the largest industrial zones in sub-Saharan Africa—the 8000-hectare state-owned Agbara Industrial Estate, which includes the Federal Ogun State-Guandong Free Trade Zone. The GDP of Ogun State was put at $10.47 billion, and it ranked as the 9th state in Nigeria with the highest GDP [42]. The state has 20 LGAs, out of which three (Ado-Odo/Ota, Ifo, and Shagamu) that are within the boundary of the state with Lagos State. Two (Ado-Odo/Ota and Ifo LGAs) share extensive conurbation with Lagos State.

The local government areas along the borders of Lagos and Ogun States that form an extensive conurbation and served as the area for this study are Alimosho and Ifako-Ijaiye LGAs in Lagos State and Ado-Odo/Ota and Ifo LGAs in Ogun State. These LGAs are closely interconnected by several roads, making them appear to be urban areas under the same administration. The rapid spatial and population growth of Lagos and Ogun states has led to consequential rapid uncontrolled development in the border areas of both states. This development has been characterized by chaotic, uncontrolled growth and form and has manifested in various dimensions of urban deprivation for residents of these areas.

2.2. Methodology

A multistage sampling procedure was employed to select eligible respondents for the study. The first stage involved identifying and selecting settlements across the four Local Government Areas (LGAs). Preliminary survey revealed that there are four such of settlements in Alimosho, three in Ifako-Ijaiye, five in Ado-Odo/Ota, and four in Ifo LGAs. One out of every two settlements were randomly selected in each of the LGAs, making nine settlements available across the four LGAs. These are Amikanle and Ilapo in Alimosho LGA; Iju-Ishaga and Agbado in Ifako-Ijaiye; Ota, Sango, and Ijoko in Ado-Odo/Ota; Oke-Aro and Akute in Ifo LGA. Findings from Google Earth coupled with the authors' preliminary survey revealed that there were 409 streets in the selected settlements in Alimosho, 395 in Ifako-Ijaiye, 565 in Ado-Odo/Ota and 437 in Ifo LGAs, respectively.

In each settlement, all streets were first enumerated, yielding a total of 1806 streets across the study area, which constituted the sampling frame. From this frame, one out of every 20 streets were systematically selected, resulting in a sample of 91 streets. Buildings located along the selected streets were then identified, producing a total of 3522 buildings, which formed the household sampling frame. Using systematic sampling, every 10th building on each selected street was surveyed, corresponding to approximately 10% of buildings on the sampled streets. In the case of multi-storey buildings, the first apartment on the ground floor was selected. Where the selected respondent was below the legal adult age (18 years), the building was skipped, and the next eligible building in sequence was selected. In total, 353 questionnaires were administered, of which 325 were successfully retrieved and analyzed, yielding a 92.0% response rate, which exceeds the 30–60% threshold considered adequate for survey research [43].

The data collected were analyzed in line with the study objectives. Respondents' socioeconomic characteristics were summarized using descriptive statistics. Importance of settlement attributes was measured on a 5-point Likert scale (1 = very unimportant; 2 = unimportant; 3 = moderately important; 4 = important; 5 = very important), while satisfaction was measured on a parallel 5-point scale (1 = very dissatisfied; 2 = dissatisfied; 3 = neutral; 4 = satisfied; 5 = very satisfied). For each attribute, the Summation of Weighted Values (SWV) was computed as the sum of (frequency × weight), and the Mean Weighted Value (MWV) was obtained as SWV divided by the number of respondents. MWVs were aggregated across attributes to generate the Residents' Importance Attached Index (RIAI) and the Residents' Satisfaction Derived Index (RSDI). Facility conditions were assessed using a Facility Condition Index (FCI), computed as the MWV of condition ratings for each facility type.

Formally: $SWV = \Sigma(f_i \times w_i)$; $MWV = SWV/N$, where f_i is the number of responses in category i, w_i is the category weight, and N is the number of respondents. The SWV for each "importance attached" and "satisfaction derived" was obtained through the addition of the product of the number of responses of each strategy and its respective weighted value attached to each rating. The average "importance attached" and "satisfaction derived" across both states in the study areas were generated by summing MWV for "importance attached" and "satisfaction derived", respectively, based on the total ratings for each attribute. A similar procedure was used to obtain the average condition of infrastructure (PCFI) in the study area.

3. Results

This section presents the study findings, beginning with the socioeconomic profile of respondents. It further examines residents' levels of importance and satisfaction with physical, social, and economic attributes, the condition of facilities, and the resulting dimensions of urban deprivation in the study area.

3.1. Socioeconomic Attributes of Residents

The study examined the socioeconomic characteristics of residents to contribute to an understanding of the degree, intensity, and distribution of urban deprivation [10,12]. These characteristics, according to [7,27,44], have important policy outcomes to evaluate the strengths and weaknesses of local areas in order to improve targeting of local social and economic development programmes. Variables considered are gender, age, income, education status, length of stay in their area, household size, and house tenure.

Presented in Table 1 are findings on the gender of respondents. In the study area, the proportion of males to females is almost the same, with males constituting 52.3% of the respondents and females accounting for 47.7% of the respondents. Studies such as [7,11,13] have identified the education status of people as a strong determinant of knowledge of urban deprivation. Across both states in the study area, 9.2% had primary education, 41.8% had secondary education, and 55.4% had tertiary education. The findings revealed a relatively high level of education as such, respondents can provide information on urban deprivation in their locality.

Table 1. Socioeconomic Characteristics of Respondents.

Attribute	Lagos State	Ogun State	Total
	Frequency (%)	Frequency (%)	Frequency (%)
Gender			
Male	79 (52.7)	91 (52.0)	170 (52.3)
Female	71 (47.3)	84 (48.0)	155 (47.7)
Total	150 (100.0)	175 (100.0)	325 (100.0)
Income Status			
≤₦50,000	43 (28.7)	52 (29.7)	95 (29.2)
₦51,000–100,000	87 (58.0)	96 (54.9)	183 (56.4)
≥₦101,000	20 (13.3)	27 (15.4)	47 (14.4)
Total	150 (100.0)	175 (100.0)	325 (100.0)
Age			
<20	14 (9.3)	24 (13.7)	38 (11.7)
21–39	110 (73.3)	114 (65.1)	224 (68.9)
41–60	22 (14.7)	34 (19.8)	56 (17.2)
≥60	4 (2.7)	3 (1.7)	7 (2.2)
Total	150 (100.0)	175 (100.0)	325 (100.0)
Educational Status			
Primary	4 (2.7)	5 (2.9)	9 (2.8)
Secondary	66 (44.0)	70 (40.0)	136 (41.8)
Tertiary	80 (53.3)	100 (57.1)	180 (55.4)
Total	150 (100.0)	175 (100.0)	325 (100.0)
Household Size			
≤5	131 (87.3)	154 (88.0)	285 (87.7)
6–10	19 (12.7)	21 (12.0)	40 (12.3)
Total	150 (100.0)	175 (100.0)	325 (100.0)
Length of Respondents' Stay			
≤10 years	107 (71.3)	120 (68.6)	227 (69.8)
11–20 years	40 (26.7)	48 (27.4)	88 (27.1)
≥21 years	3 (2.0)	7 (4.0)	10 (3.1)
Total	150 (100.0)	175 (100.0)	325 (100.0)
House Tenure			
Owner occupied	51 (34.0)	52 (29.7)	103 (31.7)
Rented	99 (66.0)	123 (70.3)	222 (68.3)
Total	150 (100.0)	175 (100.0)	325 (100.0)

The age of respondents is another basic characteristic that contributes significantly to identifying and understanding the views of individuals based on issues such as urban deprivation. For ease of presentation, continuous raw data collected on the age of the residents were categorized into four to aid better presentation. These are teenagers (those less than 21 years), young adults (21 to 39 years), elderly adults (40 to 59 years), and old people (above 60). Findings from the Lagos State axis revealed that 9.3% of the respondents were teenagers, 73.3% were younger adults, 14.7% were elderly adults, and 2.7% of the respondents were old people. Results from the Ogun State revealed that respondents within the age groups of teenagers, young adults, elderly adults, and old people constituted 13.7%, 65.1%, 19.8% and 1.7%, respectively. Generally, the majority (68.9%) of the residents fell within the young adult age group. This indicates that most of the respondents are in their prime age when they should be desirous of a good quality of life for themselves rather than urban deprivation.

According to Julio [12], having a good and permanent income helps an individual meet his/her basic needs and afford essential amenities. The income classification was carried out based on the prevailing Civil

Service Salary Scale in Lagos and Ogun States. The minimum wage at the federal level in Nigeria is ₦30,000 and has been adopted by both states. Hence, incomes below ₦50,000 were categorized as low income because most of them belong to the lower cadre of the civil service. The medium monthly incomes were categorized as from ₦51,000 to ₦100,000, while residents earning above ₦100,000 were categorized as high-income earners. In Lagos State, 28.7% of the respondents were low-income earners, 58.0% were middle-income earners, and 13.3% were high-income earners. Findings from the Ogun State areas revealed that the proportion of respondents that comprised low-, middle-, and high-income earners were 29.7%, 54.9% and 15.4%, respectively. The average income of ₦55,498.67 and ₦56,537.14 in Lagos and Ogun States, respectively, while the overall mean income of the respondents in the study area is ₦56,017.81.

The household size of the respondents was assessed. This is premised on the assumption that the population will rely upon the existing available facilities in the settlements. Overpopulation in an area invariably places existing infrastructural facilities under pressure. Household sizes with one to five members were categorized as small, and those with six to ten members were large. In the Lagos State axis, respondents with small and large household sizes constituted 87.3% and 12.7%, respectively, while respondents with low and high household sizes accounted for 88.0% and 12.0%, respectively, in the areas of the Ogun State axis. The mean household size in the study area was five. In summary, the majority (87.7%) of the respondents across the areas of the two states have a small household size.

The length of stay of residents within the border settlements was categorized into three (≤10 years; 11–20 years; >20 years). Findings from the Lagos State axis revealed that 71.3% of the respondents have lived in the area for less than 10 years, 26.7% have spent 11–20 years in the area, and 2.0% have lived in the axis for more than 20 years. On the other hand, in the Ogun State axis, 68.6% indicated that they had spent less than 10 years in the area, 27.4% have lived in the area for 11–20 years, and 4.0% lived in the axis for over 20 years. The calculated mean length of stay of residents in the area was seven years. The significant proportion of respondents who have spent less than 10 years (69.8%) in the study area indicates rapid growth and migration of people into border areas of both states, thereby emphasizing the need for stakeholders to improve living conditions in border areas.

Findings were also made on house ownership in the study area. The essence of this variable is that the ownership or otherwise of the house occupied by a resident influences their level of assessment of urban deprivation. In the Lagos State axis, 34.0% of the residents sampled were house owners, while 66.0% rented their houses. In Ogun State, 29.7% of the sampled residents are house owners, while the remaining (70.3%) live in rented apartments. The result revealed that there are more landlords in the Lagos axis of the border settlements.

3.2. Residents' Level of Importance Attached and Satisfaction Derived from Physical, Social, and Environmental Attributes of Border Settlements

In a sequel to the discussion of the socioeconomic characteristics of the respondents, the level of importance attached and satisfaction derived from the physical, social, and economic attributes of the settlement are presented in this section. The importance residents attached to these attributes was computed using the Residents Importance Attached Index (RIAI), while the satisfaction derived from the attributes was computed using the Residents Satisfaction Derived Index (RSDI).

As presented in Table 2, findings revealed a contrast between the level of importance residents attached to physical attributes and the satisfaction they derived from them. Across both states, borehole water supply was consistently ranked as highly important and with satisfying service. The computed Residents Importance Attached Index (RIAI) and Resident Satisfaction Derived Index (RSDI) for residents in border settlements of Lagos State (4.69, 3.98) and Ogun State (4.85, 3.83) underscore the critical need for and satisfaction with borehole water supply in the study areas. This confirmed the assertion of UN-Habitat [45] that about 80% of the borehole water supply was sold to residents in the study area.

On other variables related to physical attributes in the Lagos State axis of the study area, a sharp contrast existed in the level of importance attached, and the satisfaction derived from attributes such as electricity (4.81; 1.73), condition of road (4.47; 1.80), constructed drains (4.43; 2.87), and constructed bust stops (4.43; 2.87), among others. In Ogun State border settlement areas, findings were similar as distinctive variation existed in the importance attached to physical attributes of their living environment and the satisfaction they derived from them, including electricity (4.65; 1.76), road (4.63; 1.89), constructed drains (4.59; 2.65), approved motor parks (4.39; 2.71), and housing condition (4.37; 2.65) among others. These findings implied that residents considered the identified physical attributes of the environment to be very important to sustainable living in their place of abode; however, their aspirations were cut short as the degrees of satisfaction they derived from these elements were very low. The low level of satisfaction derived from the use of these physical attributes indicates these elements are not in good condition.

Table 2. RIIs and RSIs in the Study Area.

Physical Attributes	**Lagos State**		**Ogun State**	
	RIAI	**RSDI**	**RIAI**	**RSDI**
Water supply through borehole	4.69	3.98	4.65	3.83
Water supply through well	3.83	2.25	4.09	2.34
Housing condition	3.87	3.09	4.37	2.82
Quality of the environment	3.74	1.05	3.93	1.68
Constructed drains	4.43	2.87	4.59	2.65
Road	4.47	2.80	4.63	1.82
Approved motor parks	3.81	1.78	4.39	2.71
Electricity	4.81	1.73	4.85	1.76
Constructed bus stops	4.43	2.67	4.26	1.46
Water supply through public tap	3.81	1.09	3.99	2.18
Computed Mean Deviations	4.18	2.33	4.37	2.35
Social Attributes	**RIAI**	**RSDI**	**RIAI**	**RSDI**
Private primary school	4.55	3.98	4.61	3.66
Private secondary school	4.49	3.84	4.58	3.56
Public secondary school	4.55	2.18	4.57	1.52
Clinic	4.38	2.35	4.66	3.07
Police post/Station	3.97	2.23	4.34	1.00
Waste collection services	4.35	3.22	4.55	2.03
Environmental sanitation/education	3.05	1.20	3.89	2.87
Level of sanitation	4.05	2.09	4.47	1.90
Neighbourhood friendliness	3.77	2.12	4.63	1.83
Public primary school	4.39	3.07	3.93	2.95
Community development activities	3.82	2.91	4.41	2.98
Primary health centre	4.47	1.77	4.74	1.84
Occupancy rate	3.71	1.73	4.09	2.53
Postal office	3.01	1.67	3.62	2.63
Organized open space	3.66	1.59	4.71	2.68
Crime rate	3.68	2.58	3.86	1.93
General hospital	4.62	2.55	3.94	2.69
Computed Mean Deviations	4.03	2.41	4.32	2.45
Economic Attributes	**RIAI**	**RSDI**	**RIAI**	**RSDI**
Business opportunities	4.37	2.87	4.63	3.23
Modern market/Shopping complex	3.99	3.23	4.54	3.27
Traditional market	3.91	3.03	4.35	3.10
Amount Paid for waste Disposal	3.91	2.28	3.88	2.95

Amount paid for housing	3.85	2.19	3.91	2.97
Computed Mean Deviations	4.00	2.72	4.26	3.10

Studies such as Olowoporoku, Salami, and Akintifonbo [46] and Ojo [47] classified variables such as neighbourhood friendliness, community participation, crime, occupancy rate, and organized open space, among others, as part of the socio-cultural life of the residents. These elements have been established as among the residential attributes that contribute to people's social satisfaction with living in a particular environment.

Contained in Table 2 are findings on the level of importance and satisfaction residents attach to social attributes across the study area. Findings from the Lagos State axis, social attributes residents attached high importance to general hospital (4.62; 2.55), private primary school (4.55; 3.98), public secondary school (4.55; 2.18), private secondary school (4.49; 3.84) and primary health care (4.47; 1.77), public primary school (4.39), clinic (4.38), waste collection service (4.35; 3.22) and level of sanitation (4.05; 3.07). In comparison, the results revealed that residents' satisfaction derived from these important attributes was very low relative. Impliedly, residents attach high importance to these social attributes; however, the satisfaction they derive from their availability or functionality in their community is low, hence implying deprivation. In Ogun State areas, the result of the importance attached and satisfaction derived from social attributes are primary health centre (4.74; 2.68), organized open space (4.71; 2.98), clinic (4.66; 3.07), neighbourhood friendliness (4.63; 1.83), private primary school (4.61; 3.61) private secondary school (4.58; 3.56), public secondary school (4.57; 1.22), police post/station (4.34; 1.00), community participation (4.41; 2.98) and occupancy rate (4.09; 2.53). The results indicate that the satisfaction residents derived from the availability and functionality of social attributes was low, hence connoting some degree of urban deprivation.

Also contained in Table 2 are findings on the importance attached and satisfaction derived from economic attributes in the study areas. Variables considered include an environment for business opportunities, modern markets, traditional markets, the amount paid for waste disposal, and housing. All these economic attributes were found to vary in levels of importance and satisfaction derived from them. Findings revealed that residents on the Lagos State axis attached high importance to business opportunities (4.37) and modern market/shopping complexes (3.99); however, they were satisfied with the attributes of modern and traditional markets, as they weighed 3.23 and 3.03, respectively. In the Ogun State areas, the economic attributes that residents attached high importance to were business opportunities (4.63), modern market/shopping complex (4.54), and traditional market (4.35). The overall mean rating of 3.10 on the Ogun State axis indicates that residents of border settlements derived higher levels of satisfaction with economic attributes than their Lagos State counterparts.

3.3. Condition of Physical, Social, and Economic Facilities in Border Settlements

The study also examined residents' assessment of the condition of physical, social, and economic facilities in border settlements. As presented in Table 3, The overall condition of physical, social, and economic facilities in both Lagos State and Ogun State border settlements was assessed. The overall average Physical Facility Condition Indexes (PFCI) was 2.92 for Lagos State and 2.98 for Ogun State. The overall Social Facility Condition Indexes (SFCI) was 3.10 for Lagos State and 3.16 for Ogun State, and the overall mean Economic Facility Condition Indexes (EFCI) was 3.20 for Lagos State and 3.32 for Ogun State border settlements, respectively.

As presented in Table 3, residents in the Lagos State axis of the border settlements considered the conditions of a borehole (4.15), constructed drains (3.08), and hand-dug well (2.93) to be good, thus having positive indexes higher than the computed mean PFCI (2.92). Impliedly, these facilities are in good condition and provide service to residents in the area. Other physical facilities, such as transport (2.74), roads (2.80), and electricity (2.71), had lower indexes than the mean PFCI, indicating that these facilities are in poor condition and unable to provide satisfactory service to users. In the border area of Ogun State,

physical facilities considered to be in improved condition by residents include a borehole (3.94) and a hand-dug well (3.19), as they were weighted higher than the mean PFCI (2.98). Other physical facilities, such as transport facilities and roads, weigh lower than the mean PFCI on the axis, and electricity weighs equally the mean PFCI. Overall, the condition of physical facilities in the study area is low.

Table 3. Condition of Physical, Social, and Economic Facilities.

Physical Facilities	**Lagos State**		**Ogun State**	
	PFCI	**PFCI − $\overline{\text{PACI}}$**	**PFCI**	**PFCI − $\overline{\text{PACI}}$**
Hand dug well	2.93	0.01	3.19	0.21
Public tap	2.06	−0.86	2.33	−0.65
Borehole	4.15	1.23	3.94	0.96
Transport facilities	2.74	−0.18	2.45	−0.53
Road	2.80	−0.12	2.88	−0.10
Electricity	2.71	−0.21	2.98	0.00
Constructed drains	3.08	0.16	3.12	0.14
Mean PFCI	2.92		2.98	
Social Facilities	**SFCI**	**SFCI − $\overline{\text{SFCI}}$**	**SFCI**	**SFCI − $\overline{\text{SFCI}}$**
Waste collection services	3.45	0.35	3.26	0.10
Public secondary school	2.83	−0.27	3.09	−0.07
Public primary school	2.29	−0.81	2.85	−0.31
Private secondary school	4.05	0.95	3.76	0.60
Private primary school	4.06	0.96	3.84	0.68
Primary health centre	2.61	−0.49	2.89	−0.27
Postal office	2.38	−0.72	2.54	−0.62
Police post/Station	3.45	0.35	3.35	0.19
Organized open space	2.68	−0.42	2.59	−0.57
General Hospital	3.03	−0.07	3.34	0.18
Clinic	3.24	0.14	3.22	0.06
Mean SFCI	3.10		3.16	
Economic Facilities	**EFCI**	**EFCI − $\overline{\text{EFCI}}$**	**EFCI**	**EFCI − $\overline{\text{EFCI}}$**
Traditional market	3.10	−0.10	3.37	0.05
Modern market/Shopping complex	3.31	0.11	3.27	−0.05
Mean EFCI	3.20		3.32	

On social facilities, findings from the Lagos State axis revealed that private secondary school (4.05), private primary school (4.06), police post/station (3.45), waste collection services (3.45), and clinic (3.24) weighted higher than the computed SCFI, implying facilities are in good conditions. Those weighted lower than the mean SFCI implied poor condition and include general hospital (3.03), public secondary school (2.83), organized open space (2.68), postal office (2.38), and public primary school (2.29). In the Ogun State axis, social facilities that weighted higher than the mean SFCI include secondary schools (3.76), private primary schools (3.84), police post/station (3.35), general hospital (3.34), waste collection services (3.26), and clinic (3.22). Those that ranked below the mean SFCI include public secondary school (3.09), public primary school (2.85), postal office (2.54), and organized open space (2.59).

The computed mean EFCI for border settlements in Lagos and Ogun States were 3.20 and 3.32, respectively. Findings from both states showed similar responses in terms of the condition of economic facilities. In both states, modern markets/shopping complexes weighted higher than the mean EFCI, while traditional market-weighted lower, indicating traditional markets in border settlements in both states are in poor condition.

The analysis of "importance attached", "satisfaction derived", and "condition" of physical, social, and economic attributes in both Lagos State and Ogun State border settlements reveals a significant level of

urban deprivation across the three dimensions identified in the study. The study established that residents in border settlements across both states derive low satisfaction from settlements, attributes they attach high importance to because urban facilities in the study area are mostly in poor conditions. The huge differences in the overall average importance attached and satisfaction derive by residents in the physical, social, and economic attributes of each indicator further explain the prevalent level of multi-dimensional deprivation in the study area, which is accompanied by rapid population growth (68.9% of residents in the border settlements have spent less than 10 years in the study area). Also, the low PFCI scores indicate a significant deficit in basic infrastructure, such as roads, drains, and electricity. The low SFCI scores also indicate that residents encounter challenges with sustainable access to essential social facilities like healthcare and education, while the low mean EFCI scores suggest limitations in economic opportunities and livelihood options for residents in these areas. These findings underscore the need for targeted interventions to address the multifaceted dimensions of urban deprivation in border settlements in the study area.

These findings have direct implications for ecological civilization–oriented urban development. First, persistent gaps in basic services and poor facility conditions translate into avoidable environmental and health burdens, particularly for low- and middle-income households in rapidly urbanizing peripheries. Second, the Lagos–Ogun border corridor illustrates how fragmented governance and uneven infrastructure responsibilities can institutionalize deprivation in spaces that are functionally metropolitan but administratively divided. Advancing equitable access to services, reducing environmental burdens, and strengthening resilience in such border settlements, therefore, requires coordinated land-use management, shared infrastructure planning and maintenance, and accountability mechanisms that operate across state boundaries.

4. Discussion

4.1. Border Settlement Development Processes and the Political Economy of Deprivation

Urban deprivation in the Lagos–Ogun border settlements is best understood not only as an observed condition of service deficits, but as an outcome of the development process through which these settlements have been absorbed into a functionally inter-state metropolitan system. The border corridor has evolved as a zone of residential and economic spillover driven by Lagos' rapid growth, population mobility, and land–housing market dynamics [35,48]. Rising real estate costs in the metropolitan core and proximity-driven migration pressures have accelerated settlement expansion in Ogun State border LGAs, often under conditions of weak development control and limited coordinated infrastructure provision [7,49–51]. In the context of this study, deprivation reflects how the pace and form of settlement consolidation have outstripped the capacity of public institutions to plan, finance, and maintain trunk infrastructure and social services across an administratively fragmented conurbation. The study's findings revealed a consistently high importance attached to basic services but low satisfaction and poor facility conditions, suggesting deprivation as a systemic outcome of metropolitan expansion without metropolitan governance.

In the study area, housing and service delivery outcomes are embedded in a wider political-economic process. The dominance of rented housing indicates an active residential market capable of absorbing population growth; however, housing quality remains constrained by misalignment between housing production, the availability of serviced land, and infrastructure investment. Contextually, Lagos is characterized by a high prevalence of rental housing among low-income households, estimated at about 68% of housing stock [52]—a housing market structure that also shapes the dynamics of population spillover into adjoining Ogun border settlements. Consequently, while households gain access to shelter, they remain exposed to unreliable services, environmental hazards, mobility constraints, and time costs.

Despite the presence of low- to middle-income economic activity, households in the study areas' buying power does not translate into improved collective service provision. Instead, residents increasingly rely on private or market-based coping strategies, most clearly reflected in relatively higher satisfaction

with borehole water supply. This "privatization of coping" enables short-term survival and continued settlement expansion but reinforces uneven access and shifts service costs from the state to households [53–55]. Within the context of this study, ecological civilization is thus used in an operational sense to capture how equitable service access, environmental risk reduction, and long-term sustainability intersect; in the Lagos–Ogun border corridor, it provides a lens for understanding how fragmented governance, uneven infrastructure investment, and market-led development processes generate environmental injustice and sustainability risks in rapidly urbanizing peripheral spaces.

4.2. Governance Fragmentation and Service Neglect in Border Conurbations

The findings of this study reveal that urban deprivation in the Lagos–Ogun border settlements is strongly linked to governance fragmentation arising from metropolitan expansion across administrative boundaries. Although these settlements function as part of a single urban system, responsibility for infrastructure provision, maintenance, and service delivery remains institutionally divided between Lagos and Ogun States. This fragmentation manifests in persistent gaps between the high importance residents attach to basic physical and social infrastructure, such as roads, electricity, drainage, healthcare, and public education, and the low satisfaction they derive from these services. The consistently low Residents' Satisfaction Derived Index (RSDI) and Facility Condition Index (FCI) scores across both states suggest that border settlements are effectively caught in a "jurisdictional blind spot" (A situation where neither administrative entity assumes clear responsibility for service provision in functionally integrated border areas)," where neither state assumes full accountability for integrated service provision. As a result, these functionally metropolitan spaces experience systemic neglect despite rapid population growth and increasing demand for urban services.

4.3. Environmental Burdens, Urban Justice, and Ecological Civilization Outcomes

The observed mismatch between residents' aspirations and lived conditions has important implications for environmental burdens and urban justice in border settlements. Poor conditions of roads, drainage systems, electricity, and sanitation infrastructure expose households to heightened risks of flooding, pollution, poor mobility, and health hazards. These environmental and social costs are disproportionately borne by residents who already experience limited economic opportunities, reinforcing multidimensional deprivation. From an ecological civilization perspective, such outcomes highlight how inequitable access to basic services undermines both human well-being and ecological integrity. The findings demonstrate that urban deprivation in border settlements is not only a development failure but also a sustainability challenge, where fragmented governance structures prevent coordinated land-use planning, resilient infrastructure development, and collective environmental management. Addressing deprivation in these areas is therefore central to advancing ecological civilization outcomes that emphasize social equity, reduced environmental harm, and long-term urban resilience.

4.4. Market Provision Versus State Responsibility in Service Delivery

An important insight from the study is the relatively high satisfaction associated with borehole water supply compared to other public services. Unlike roads, electricity, drainage, and public healthcare, which are largely state-provided, borehole water systems are predominantly delivered through market-based or household-level arrangements. Residents' higher satisfaction with borehole water reflects the capacity of private provision to respond to immediate needs in the context of institutional failure. However, reliance on market solutions also underscores the retreat of the state from its core responsibility for universal service provision. While private provision may temporarily mitigate deprivation, it often exacerbates inequality by shifting costs to households and excluding those unable to pay. The contrast between relatively satisfactory

privately provided services and poorly performing public infrastructure highlights the need for renewed state engagement and intergovernmental coordination in border settlements, particularly to achieve equitable and sustainable urban development.

5. Conclusions and Recommendations

This study assessed urban deprivation in border settlements forming the Lagos–Ogun conurbation by examining residents' perceived importance and satisfaction across physical, social, and economic attributes, alongside facility conditions measured using the Facility Condition Index. The findings reveal pronounced gaps between residents' aspirations and lived experiences across all three domains, confirming that deprivation in the border corridor is structurally multidimensional rather than confined to any single service sector. More importantly, the study findings point to a process-based interpretation: deprivation in the study area is best understood as an outcome of metropolitan expansion and economic adjustment unfolding across administrative boundaries. Although border settlements increasingly function as part of a single urban system in terms of residence, mobility, and economic activity, planning, financing, and service responsibilities remain institutionally fragmented. This mismatch in functional integration without institutional integration in the study area further explains persistent dissatisfaction with highly valued services such as roads, electricity, drainage, health, and education. Also, the poor condition of facilities in the Lagos–Ogun conurbation buttress sprawling growth, which is faster than coordinated public investment, maintenance, and accountability.

The study further highlights the political economy shaping service access in the border corridor. Where public provision is weak or unreliable, households adopt private coping strategies, most clearly reflected in relatively higher satisfaction with borehole water supply. While such market-based provision can temporarily ease service deficits, it shifts costs to households and reproduces uneven access, underscoring that deprivation is not merely a technical infrastructure gap but a function of how risks, costs, and responsibilities are distributed within the local economy. From an ecological civilization perspective, these dynamics matter because persistent service gaps impose avoidable environmental and health burdens and weaken resilience. In the Lagos–Ogun border corridor, ecological civilization is applied operationally as a lens linking equitable service access, environmental risk reduction, and long-term sustainability, drawing attention to how fragmented governance, uneven investment incentives, and weak alignment between settlement growth and serviced land development generate environmental injustice and sustainability risks in rapidly urbanizing peripheral spaces.

Implications for Planning and Development Practice

First, the findings imply that urban deprivation in border conurbations cannot be effectively addressed through sector-specific or isolated service interventions alone. Deprivation in the Lagos–Ogun border corridor emerges from a development process in which housing markets, settlement expansion, and economic activity operate at a metropolitan scale, while planning, financing, and service responsibilities remain fragmented along administrative boundaries. Planning responses must therefore align more closely with the functional geography of the urban economy, recognizing the Lagos-Ogun border settlements as integral components of a single metropolitan system rather than peripheral or residual spaces.

Second, the study underscores the central role of housing markets in shaping deprivation outcomes in rapidly expanding Lagos-Ogun border settlements. The dominance of rental housing and market-led residential growth indicates that population absorption is occurring without commensurate expansion of serviced land and public infrastructure. This suggests the need for planning approaches that better integrate housing development with infrastructure provision and maintenance, particularly in peri-urban corridors where settlement consolidation proceeds faster than public investment. Without such alignment, housing

expansion in the study area is likely to continue reproducing service deficits and environmental risks, even in the presence of local economic activity.

Finally, the reliance on private and market-based coping strategies in the study area highlights a broader shift in how basic services are accessed and financed. While such strategies may support short-term survival and settlement growth, they also shift costs and risks to households and reinforce uneven access to essential services. From an ecological civilization perspective, this has implications for urban sustainability and equity, as fragmented governance and uneven investment undermine both environmental resilience and social wellbeing. Addressing deprivation in the Lagos-Ogun border settlements, therefore, requires greater attention to the institutional and economic processes that structure service provision, rather than treating service deficits as purely technical or managerial problems.

Author Contributions

J.O. led the overall research work, including study design, data collection, data analysis, and substantial contributions to manuscript drafting; O.O. co-led the conceptual formulation, literature review, data analysis, and the overall writing and structuring of the manuscript; O.D. supervised the entire research process, co-formulated the core study concept, reviewed the data analysis, and contributed to the development of the policy recommendations. All authors reviewed and approved the final manuscript.

Ethics Statement

The study followed required ethical procedures for research involving human participants, including informed consent and confidentiality, in line with the Helsinki Declaration and comparable national/institutional standards and approved by the Post gradute College Board of Obafemi Awolowo University, Ile-Ife on 22 August 2018.

Informed Consent Statement

Informed consent was obtained from all subjects involved in the study.

Data Availability Statement

Data are available from the authors upon reasonable request.

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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