Spatial Inequalities in Accessibility to Social Amenities in Developing Countries: a Case from Nigeria

Dr Adekunle J. Aderamo and O.A. Aina

Department of Geography, University of Ilorin, Ilorin, Nigeria.

Abstract: The paper examined inequality in the distribution of social amenities in a Local Government Area in Nigeria. Inequality in the study area manifests in the form of unequal provision of social amenities within the districts of the local government. Provision of three social amenities was studied. These are educational, health and market facilities. The data used were collected on these facilities from a sample of the inhabitants, records of Ifelodun Local Government offices and the Local Government Education Authority. The Z-score variate was then used to determine the spatial pattern of provision of the three facilities in the study area. The results of the analysis showed that inequalities exist in the provision of accessibility of social amenities in Ifelodun Local Government using educational, health and market facilities as criteria for measurement. In view of the fact that the federal, state and local governments provide most of these social amenities in Nigeria, the paper suggests that communities should supplement governments’ efforts in order to improve the well-being of the people.

Key words: Public facilities, central place, distribution, well-being, accessibility.

INTRODUCTION

Human life and development is based on the extent to which man can satisfy the basic needs such as food, clothing, shelter and water. In order to fulfil these and other needs, man requires access to certain facilities such as market, housing, water supply, electricity and adequate transportation. These facilities are however, unequally distributed over space. But these infrastructures form an important and integral part of life of any community either urban or rural.

Many empirical findings have shown that facilities are unequally distributed in our communities such that the vast majority of the people are caught in a never ending struggle to gain access to infrastructures in order to improve their quality of life (Eyles, 1996, Oyerinde, 2006). Spatial inequality or inequality in accessibility to social infrastructures within the population of a society has existed since the dawn of civilization. The historical origins of social inequality are manifold, the caste systems for instance, developed in India and many examples of colonial occupation have resulted to racism towards indigenous Americans and Aborigines of Australia. Gross social inequality was epitomized in the South African system of apartheid. The social inequality was in form of segregation in which the European or colonial masters enjoyed infrastructural or public facilities while the indigenous areas were deprived of such facilities totally or partially (Hill, 1996).

Inequalities in access to social infrastructures may also be as a result of inefficiency in the distribution and allocation of facilities between areas or as a result of social barriers like ethnicity, religion or status which may directly limit certain groups from having access to public facilities. This is a prominent characteristic of a capitalist economy (Stevenson, 2004). These inequalities are for the most part, the direct and inevitable result of the normal operations of the capitalist mode of production. Capitalist inequalities is a major factor in determining the physical and psychological plight of the majority of the human race, particularly in the areas of income distribution, life expectancy, infant mortality, morbidity, physical and mental illness all of which are examples of deprivation which threaten the social order and development of any nation.

Inequalities exist between spatial units as they do between individuals (Anderson and Pomfret, 2004; Henderson, Shalizi and Venables, 2001; Kanbur and Venables, 2005). The spatial variation in availability and access to infrastructure results in spatial disparities in living standards both within and between regions and localities (Madu, 2007).

Indeed, global inequalities in income and living standards have reached grotesque proportions (Conachy, 1999). According to the United Nations Human Development Report (NHDR) published in 1999, while 1.3 billion people struggled to live on less than US $1.00 a day, the world’s richest 200 people doubled their net

Corresponding Author: Dr Adekunle J. Aderamo, Department of Geography, University of Ilorin, Ilorin, Nigeria.
worth between 1994 and 1998 to more than $1.0 trillion US dollars. Also, as at 1999 about 840 million people were reported to be malnourished and close to one billion found it difficult to meet their basic consumption requirements. More than 880 million people lacked access to health services and 2.6 billion people had no access to basic sanitation (UNHDR Report, 1999).

Kattan (2006) also reported that the poorest 40 per cent of the world population, i.e. the 2.5 billion people who live on less than $2.00 US dollars a day, account for 50 per cent of global income while the richest 10 per cent account for 54 per cent. The world’s poor also benefit little from increasing technology and knowledge. 10 countries account for 84 per cent of global research and development expenditures and control 95 per cent of United States patents (Milanovic, 2002). Further, increased trade, new technologies foreign investment and expanding communications networks are not evenly or fairly distributed on a world scale (Giraud, 2002).

Access to infrastructure inspires life and well-being. This in turn breeds a sense of self-reliance, national pride and also aids the realization of full potentials and opportunities by the individual thereby reducing inequalities among the citizenry (Oyebanji, 1978). Infrastructures are an important part of any rural community. Provision of such facilities discourages rural-urban migration which means that public facilities have to be provided to both urban and rural communities (Mabogunje, 1997).

**Geographical Theories and the Concept of Inequality:**

One major concept which can provide a common form of reference for planning and analyzing the provision and spatial distribution of public facilities is planning standards. However, Dickson et al., (1996) have argued that provision points of facilities could be sufficiently explained according to central place theory with a regular hexagonal spatial pattern of provision at the lowest level, building up to a regular pattern of provision at each of the higher levels. Thus the type of standard which planners have developed to provide a solution to these problems of inequalities owe a depth of gratitude to geographical theories of central place.

Geographers have long recognized the broad relationships between settlement size, inter-settlement distance and the range of facilities available in settlements of different sizes. Central place theory has been used by a German geographer, Walter Christaller (1933) to explain how urban settlements evolve and are spaced out in relation to each other.

The model in central place theory is explained using geometric shapes, such as hexagons and triangles. The locations are assumed to be located in a Euclidean, isotropic plane with similar purchasing power in all directions. The assumption of universality in the transport network was also established and all parts of the plain were served by the central place. A central place is a settlement or a nodal point that serves the area around with goods and services. Christaller’s model also was based on the premise that all goods and services were purchased by consumers from the nearest central place, that the demands placed on all central places in the plain were similar and that none of the central places made any excessive profit (Agarwal, 2001).

The theory consisted of the basic concepts of centrality, threshold and range. ‘Centrality’ is the draw to a particular place. The ‘threshold’ is the minimum market that is needed to bring a new firm or service provider or city into existence and keep it running and the ‘range’ is the average minimum distance that people will travel to buy these services or goods. This is the marketing principle in Christaller’s model. The marketing principle is better known as the K = 3 system, where a hexagonal space is envisaged with the central places serving two lower-order places each or one-third of the lower-order places each or one-third of the lower-order neighbours surrounding them. So, including the central place itself, a total of three places are served. The goal in the marketing principle was to serve a maximum number of consumers from a minimum number of centres. The hierarchy in the marketing model follows the rule of 3s (1, 3, 9, 27, 81, ...) where a consumer equidistant from three higher order places A1, A2, and A3 would purchase 1/3 from A1, 1/3 from A2 and 1/3 from A3.

In the transportation model, the goal was to minimize the network length and maximize the connectivity of centres being served. To minimize transportation costs, a different model of K=4 is proposed, where the hexagon is shifted so that the settlements are located at the centre point of each side, and each central place serves a half-share of the surrounding hexagon, thus, the number of places served is four. In the administrative model, the goal was to provide a hierarchy of controls where the lower level centres are completely controlled or administered by the higher order places. The administrative model is where K=7 and all the six lower-order places in the hexagon are served by the central place. Christaller envisaged these models as hierarchical, with all higher order places in the hexagon surrounded by other higher-order places to explain not only local but regional economics and specialization of urban centres (Agarwal, 2001).

Central Place Theory (CPT) has been extended and modified by scholars. For instance Losch (1938) proposed a consumer model based on administrative and manufacturing structure as opposed to service centres...
in Christaller’s model. His model produced wedges of city-rich and city-poor areas spread out around a major central place (figure 1.0). Also, Heibrun (1987) has argued that the Central Place Theory has acted as a foundation for a large body of work on “Systems of Cities”. The best analogy has been made to the planetary system, where individual units are kept in place by gravitational forces between them. The Central Place Theory attempts to show that each urban settlement is held in place within a system of cities and any changes in these are determined by a place’s position within the system (Heilbrun, 1987. Abiodun, 1967).

![Central Place Theory](figure 1.0)

The relevance of Christaller’s Central Place Theory to the issue of inequality is that the hierarchical organisation of the central places into higher and lower order shows that there is inequality in their accessibility to facilities whereby there are more establishments in one region than the other. Although the issue of inequalities has been well researched, especially on large geographical scales, yet inequalities can be examined also at a micro scale. This is because most geographical studies can be carried out at regional, city and local scales (Oyebanji, 1986). The objective of this study is to examine the inequality in accessibility of social amenities in Ifelodun Local Government Area of Kwara State with a view to making a more equitable provision of these amenities.

**MATERIALS AND METHODS**

The data used for this study were obtained from both primary and secondary sources. The map of the study area is as shown on figure 2. The study area comprises of 9 districts which are administrative subdivisions of the Local Government. The districts are Agunjin, Idofian, Ileere, Igbaja, Oke-Ode, Omupo, Ora, Oro-Ago, Share.

![District Map of Ifelodun LGA of Kwara State](figure 2)
RESULTS AND DISCUSSION

Table 1.0 shows information on the population of each district, number of schools, number of markets, number of health centres and average area served by these facilities. The table shows that Agunjn, Ileere, Omupo, Ora, and Oro-Ago districts have 1 market each while Idofian, Igbaja, Oke-Ode and Share districts have 2 markets each. In terms of average walking distance and area served by a market, Oro-Ago district ranks first with a market serving a radius of 6.0km while Ileere district ranks second with a market serving an average of 5.5km radius. The third district in rank is Share district with a market serving an average radius of 5.4km. The other districts are Igbaja, Oke-Ode, Idofian, Ora, Omupo and Agunjn ranking fourth, fifth, sixth, seventh, eighth, and ninth in that order. The distribution of market facilities in the Local Government shows inequalities in both the number and areas served by them.

<table>
<thead>
<tr>
<th>S/N</th>
<th>District</th>
<th>Population</th>
<th>No of Markets</th>
<th>Average walking radius served by a market (Km)</th>
<th>Rank</th>
<th>No of Health Centres</th>
<th>Average walking radius served by a health centre (Km)</th>
<th>Rank</th>
<th>No of primary schools</th>
<th>Average walking radius served by a primary school (Km)</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Agunjn</td>
<td>19,543</td>
<td>1</td>
<td>3.5</td>
<td>9</td>
<td>4</td>
<td>4.5</td>
<td>1</td>
<td>8</td>
<td>2.5</td>
<td>9</td>
</tr>
<tr>
<td>2</td>
<td>Idofian</td>
<td>21,910</td>
<td>2</td>
<td>4.4</td>
<td>6</td>
<td>6</td>
<td>3</td>
<td>6</td>
<td>10</td>
<td>3.8</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>Ileere</td>
<td>24,510</td>
<td>1</td>
<td>5.5</td>
<td>2</td>
<td>12</td>
<td>4.4</td>
<td>2</td>
<td>61</td>
<td>2.9</td>
<td>7</td>
</tr>
<tr>
<td>4</td>
<td>Igbaja</td>
<td>30,132</td>
<td>2</td>
<td>5</td>
<td>4</td>
<td>8</td>
<td>3.5</td>
<td>4</td>
<td>27</td>
<td>3.5</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>Oke-Ode</td>
<td>26,645</td>
<td>2</td>
<td>4.5</td>
<td>5</td>
<td>8</td>
<td>3.8</td>
<td>3</td>
<td>23</td>
<td>2.6</td>
<td>8</td>
</tr>
<tr>
<td>6</td>
<td>Omupo</td>
<td>13,510</td>
<td>1</td>
<td>3.7</td>
<td>8</td>
<td>8</td>
<td>3.2</td>
<td>5</td>
<td>18</td>
<td>3.7</td>
<td>2</td>
</tr>
<tr>
<td>7</td>
<td>Ora</td>
<td>18,340</td>
<td>1</td>
<td>3.9</td>
<td>7</td>
<td>5</td>
<td>2.5</td>
<td>8</td>
<td>11</td>
<td>3.4</td>
<td>4</td>
</tr>
<tr>
<td>8</td>
<td>Oro-Ago</td>
<td>27,610</td>
<td>1</td>
<td>6</td>
<td>1</td>
<td>9</td>
<td>2</td>
<td>9</td>
<td>9</td>
<td>3.6</td>
<td>6</td>
</tr>
<tr>
<td>9</td>
<td>Share</td>
<td>22,775</td>
<td>2</td>
<td>5.4</td>
<td>3</td>
<td>6</td>
<td>2.7</td>
<td>7</td>
<td>19</td>
<td>3.2</td>
<td>5</td>
</tr>
<tr>
<td>Total/Average</td>
<td>204,975</td>
<td>13</td>
<td>3.7</td>
<td>66</td>
<td>3.3</td>
<td>186</td>
<td>3.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Sources: 1. Ifelodun Local Government Education Authority. 2. Ifelodun Health Department. 3. Revenue Office, Ifelodun Local Government. 4. Authors’ Field Work.

The distribution of health centres shows a similar pattern. Whereas Ileere district has twelve health centres, Oke-Ode district has nine while Igbaja, Oke-Ode and Omupo districts have eight health centres each. Idofian and Share districts have six health centres each while Ora district has five and Agunjn district has only four. In terms of area coverage of service of these health centres, Agunjn ranks first with a health centre serving a radius of 4.5km while Ileere ranks second with a health centre serving a radius of 4.4km, Oke-Ode ranks third with a health centre serving an average radius of 3.8km while Igbaja ranks 4th with a health centre serving an average radius of 3.5km. The other districts are Omupo, Idofian, Share, Ora and Oro-Ago which rank fifth, sixth, seventh, eighth and ninth in that order.

The distribution of primary schools shows that Ileere has the highest number of sixty-one schools followed by Igbaja with twenty-seven schools and Oke-Ode with twenty-three schools. Share has nineteen, Omupo eighteen, Idofian ten, Oro-Ago nine and Agunjn eight. With respect to average walking radius to a school in these districts, Idofian ranks first with a school serving areas within an average walking distance of 3.8km. This is followed by Omupo with a school serving areas within an average walking distance of 3.7km. Igbaja ranks third while Ora ranks fourth. The other districts by ranks are Share, Oro-Ago, Ileere, Oke-Ode and Agunjn which rank fifth, sixth, seventh, eighth and ninth in that order.

Spatial Pattern of Inequalities in the Distribution of Amenities:

The Z-score variate has been used to analyse the spatial variation in the distribution of social amenities in Ifelodun Local Government of Kwara State. Z-score variate has been used extensively in geographic research (see Johnston, 1980; Oyebanji, 1986). Table 2.0 shows the standardized scores of spatial pattern of indicator of level of living in Ifelodun Local Government Area of Kwara State using education, markets and healthcare facilities.
facilities as criteria. The table shows that in terms of provision of educational facilities, the districts with the best facilities are Igbaja and Oke-Ode. This is followed by Ileere, Share and Omupo. Provision of educational facilities is lowest or poorest in Agunjin, Oro-Ago, Ora and Idofian districts (figure 3.0).

In terms of provision of health facilities, Ileere, Oro-Ago, Omupo, Oke-Ode and Igbaja are fairly well placed while Agunjin, Ora, Idofian and Share are poorly placed (figure 4). Inequalities in the provision of markets is also shown by the imbalances in their distribution in Ifelodun Local Government. Whereas, Idofian, Igbaja and Share are best served with this amenity. Oke-Ode, Agunjin, Ileere, Omupo, Ora and Oro-Ago are disadvantaged (figure 5.0).

<table>
<thead>
<tr>
<th>District</th>
<th>Education</th>
<th>Health</th>
<th>Market</th>
<th>Composite</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agunjin</td>
<td>-1.27</td>
<td>-0.58</td>
<td>-0.82</td>
<td>-2.67</td>
</tr>
<tr>
<td>Ileere</td>
<td>0.5</td>
<td>0.96</td>
<td>-0.82</td>
<td>0.14</td>
</tr>
<tr>
<td>Ileere</td>
<td>1.11</td>
<td>0.19</td>
<td>-1.22</td>
<td>2.52</td>
</tr>
<tr>
<td>Idofian</td>
<td>-0.95</td>
<td>-0.19</td>
<td>1.22</td>
<td>0.08</td>
</tr>
<tr>
<td>Igbaja</td>
<td>1.75</td>
<td>0.19</td>
<td>1.22</td>
<td>3.16</td>
</tr>
<tr>
<td>Omupo</td>
<td>0.32</td>
<td>0.19</td>
<td>-0.82</td>
<td>0.31</td>
</tr>
<tr>
<td>Oke-Ode</td>
<td>1.11</td>
<td>0.19</td>
<td>-1.22</td>
<td>2.52</td>
</tr>
<tr>
<td>Ora</td>
<td>-0.79</td>
<td>-0.38</td>
<td>-0.82</td>
<td>-1.55</td>
</tr>
<tr>
<td>Or-Ago</td>
<td>-1.11</td>
<td>0.38</td>
<td>-0.82</td>
<td>-1.55</td>
</tr>
<tr>
<td>Share</td>
<td>0.48</td>
<td>-0.19</td>
<td>1.22</td>
<td>1.53</td>
</tr>
</tbody>
</table>

Source: The Authors

Fig. 3: Standardised Scores on Education Facilities.

The Z - score variate is given by

\[ Z_i = \frac{X_i - \bar{X}}{S_X} \]

Where \( Z_i \) is the Z-score for observation \( i \)

\( X_i \) is the value of \( X \) for the \( i^{th} \) observation

\( \bar{X} \) is the mean of all the values of \( X \)

\( S_X \) is the standard deviation of the \( X \) values and

\[ S_X = \sqrt{\frac{N}{\sum_{i=1}^{N} (X_i - \bar{X})^2}} \]

\( N \) is the total number of observations
The composite indicator for social amenities provision in the districts of Ifelodun Local government shows that Igbaja, Oke-Ode and Share districts are the best served with social amenities in the local government. Omupo, Ileere and Idofian districts come next with a fair level of amenities provision while Agunjin, Ora and Oro-Ago have the worst level of social amenities presence. Overall, Igbaja district has the best level of living while Agunjin has the least level of living (fig. 6).
Conclusion:

Public facilities such as schools, health centres, post offices, markets, police stations are generally not uniform in their spatial incidence. This is common in developing countries where apart from uneven population distribution, many other extraneous factors such as political consideration go into locational decisions. However, consideration for the well-being of the people should be a paramount factor in provision of facilities so that the people will have a sense of belonging and the orientation of the people towards the use of these facilities will also change positively. Further, communities should participate in the provision of some of these facilities and not leave everything for the state and local governments to provide for them. Indeed, the participatory approach to the location of public facilities in communities of developing countries should be adopted.

REFERENCES