
‘Quadrupolis’; Community squares in Igbo Philosophy of Traditional Community planning settlements, a study of Owerri capital territory, Imo State, Nigeria

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Abstract. The Igbo counting philosophy is based on four,(4), or quadruplet. Thus everything in Igboland including planning is based on four (4) and or multiples of four. This principle also finds itself in rural planning of settlements of which community squares are the basic organizing units. This research identified the indicators upon which this principle works in the community squares and proposes a framework for the integration of traditional community squares in the emerging city of Owerri Capital Territory. Data were collected through questionnaires, Geographic Information System, GIS, Geographic Positioning System, GPS, observations and interviews. Chi-square, and Pearson correlation were used to analyse the data and this confirmed the presence of indicators such as hierarchy of open spaces, network of footpaths based on geometric forms in the traditional community squares. The forms showed the universality of classical planning principles and theories proving the planning ingenuity the people through history. The result showed that these affect the socioeconomic, environmental and socio-cultural activities of the people in Owerri Capital Territory.

“Keywords”; Quadrupolis, community squares, environmental resources, heritage, tradition.

1. Introduction

Traditional community squares are informal public open spaces which are environmental resources and goods that have evolved, survived and developed by the people themselves over the years. They are therefore tied to their very life, and seen as their inalienable heritage to be protected, hence their continued survival and resilience. They form important physical, sociocultural nodes and landmarks in the community (Lynch,1986).The adaptive, survival nature and lifecycle of community squares have made them very dynamic and sustainable to different demands and needs of succeeding generations of the society where they are located (Gunderson & Holling, 2002, Mustafa,1979, Walker,& Salt,2006). Attempts therefore to decimate them through formal planning and design are normally resisted, at times leading to physical and psychological conflict. The Igbo counting philosophy based on four,(4), or quadruplet finds itself in rural planning, community life and community squares. Community squares are the basic organizing unit in traditional planning which makes planning flexible and shows in four-sided forms upon which other geometric forms, such as T,Y-junction, circle are built. The geometrical forms are created by network of foot paths, local roads, hierarchy of open spaces and tracts pervading the community squares, (Plates,9.1,9.2,9.3).These provide opportunity for axial, radial, concentric and triangular forms along which buildings and other structures are built. The openness provides not only

flexible platforms for planning and design but gives limitless opportunity for physical planning.

The Igbo philosophy, dialectics, ontology, thought or principle does not shut down like the 'therefore' of Greek syllogism, they open limitless time on the transcendent, like the Arab dialectics, ontology and thought, Oguejiofor, (2005). The geometric forms created are not rigid but organic and humane. There lies the origin of the openness of the Igbos reflected in unending family ties, gregarious lifestyle, quest for expansion and increase that builds neighbourhood, friendship, understanding and relationship ingredients needed for peace, harmony with man, nature and green environment. This philosophy implies the equality of villages in Igboland and signals qualification for creation of new villages, settlements, spaces or expansion along blood family lines and eventually leads to the growth and expansion of communities and traditional towns. Consequently, most road networks, markets squares, meeting places and social functions are located and organized based on this principle. It is interesting to note that a kindred or neighbourhood is normally made of households which are built from various family units. In this research this geometric philosophy of four, 4, as the basis of space development, community growth, organizing pattern and development of human settlements in traditional communities is to be called, 'quadrustics' while the larger communities that may grow from this principle as modern cities is called 'Quadrupoles' while the singular form is quadrupolis. This cosmological development of settlement based on quadrants has also been identified in ancient Roman cities (Anthony and James, 1979). Other elements and derivatives of this principle of geometric squares in community settlements are seen in form of cross roads, T-junctions, Y-junctions, triangles and other derived geometrical forms which richly adorn nodes, landmarks, and images in traditional Igbo communities. They form pedestrianised communication networks and paths which are typical of this Igbo traditional environment. These not only provide organizing systems but create open-ended and mobile city systems as identified in the American traditional public open spaces which transformed into modern open-ended American cities, (Rapoport, 2005). In formal urban planning and design their integration requires extensive community participation which the authorities have not been fully disposed to. This has made it a little bit difficult for community squares to be accommodated in formal urban planning. Consequently, the users reject and abandon these formal plans and instead resort to abuse of the city. Theoretically, the concepts and principles embedded in the lifecycle of these community squares no doubt reinforce the universality, multicultural, multidisciplinary nature and similarity of common planning and urban design principles, theories and concepts with apparent differences only highlighting peculiar geographic and cultural needs of the people to solve their peculiar environmental problems as they arose over the years.

2. Aim and Objectives

3.1 Aim

The aim of this research is to identify geometric forms in the community squares in Owerri capital territory so as to provide a framework for their integration into urban milieu, for improved urban quality and cityscape.

3.2 Objectives of the Study

The objectives of the study are to;

1. Examine the conditions of community squares in Owerri capital territory.
2. Identify the environmental planning indicators of geometric forms in community squares in Owerri capital territory.

3. Identify the effects of network of footpaths on the community squares in Owerri capital territory

3. Research Questions

This research attempted to answer the following questions;

- i). What are the conditions of community squares in Owerri capital territory
- ii). What are the environmental planning indicators of geometric forms in community squares in Owerri capital territory?
- iii). What are the effects of network of foot paths on the conditions of the community squares

5. Hypotheses

5.1. Ho1: There is no significant difference in the conditions of the community squares in Owerri capital territory

5.2. Ho2: There is no significant effect of environmental planning of geometric forms on community squares in Owerri capital territory

5.3. Ho3: There is no significant relationship between the network of foot paths and the conditions of community squares in Owerri capital territory

4. Study Area

Owerri capital territory covered seven (7) local government areas of Owerri Municipal, Owerri west, Mbaitoli, Ikeduru, parts of Ohaji/Egbema and Aboh Mbaise local government areas. The study was done for communities squares within twenty (20) kilometer radius from *Ama JK/* Owerri general post office covering 1257 square kilometer, (Fingerhut and Partners,1978).The core urban, suburban and rural areas were defined by 5,10 and 20 kilometer radii of the concentric circles respectively (Fingerhut& partners,1977).Its external tangent was defined as follows; along Owerri – Onitsha road axis at *Ukwu-Oji* in *Umunoha*, in *Mbaitoli* local government area, along Owerri- Okigwe road axis at *Atta* in *Ikeduru* local government area, along Owerri - Umuahia road axis around *Enyiogugu* in *Aboh Mbaise* local government area, along Owerri- Aba road around *Agbala* in *Ngor Okpala* local government area, and along Owerri- PortHarcourt road axis around *Obinze* in Owerri West local government area. This encompassed the core Owerri urban, suburban and rural components that would form the future Owerri megacity of the Owerri capital territory and provided the platform to study the continuum transformation of community squares as the status of the places changed from rural through suburban to urban areas.

5. Scope Of The Study

The study area had 7 local government areas out of which 4 was sampled randomly and 13 community squares studied out of 49 community squares within the capital territory. The community squares were at various levels of condition and transformation depending on whether in urban, suburban and rural areas of the capital territory. It was therefore relevant to study the level of transformation and preservation of the community squares for comparative purposes. Although each community had many villages or kindred with smaller squares, there was always the central community square where the whole community gathered for their communal activities. The planning of Owerri capital territory was based on the concentric circle theory and conical growth pattern spreading from the centre outwards (Rodrigue,2015). This implied that Owerri Capital Territory has the urban core, the sub-urban/semi-urban and rural areas, providing opportunity for dynamic development to respond to observed inadequacies in the development of the capital territory. The research ensured the spread of the studied community squares into urban, sub-urban/semi-urban and rural areas.

6. Methodology

The research was within the twenty (20) kilometer radius from *Ama JK/ Owerri* post office as defined (Fingerhut, 1978). This touched seven (7) local government areas with 49 community squares. Through multilevel probability sampling the local government areas was reduced from 7 to 4 and the community squares from 49 to 13. The selected community squares were properly identified on ground for study with Geographic Positioning System, (GPS), Geographic Information System satellite images, (GIS), to see the transformation and use over the years. Three hundred and ninety, (390), copies of questionnaires were administered to measure the general perception of the people on and use of community squares out of which three hundred and fifty, (350) copies were retrieved, collated and analysed. The analysis was done using analysis of variance, (ANOVA), chi-square, Pearson and spearman rho rank correlation analysis statistical tools.

7. Literature Review

Building on the geometry of planning by the Summerians and Egyptians, Hippodamus in the 5th century, developed the first philosophical environmental planning of cities by theorizing the grid iron system. This gave planning rectangular and geometrical forms to urban spaces with community squares called agora, (Anthony and James, 1979; Sporre, 2000). Thus geometry has since been part and parcel of environmental planning in human history as a means of creating environmental order in form of gardens, parks and squares. Community squares in advanced environments, properly identified and designated were upgraded into gardens, recreational parks, activity or civic centres in emerging urban areas. This was not the case in Owerri capital territory and most other cities in Imo State and Nigeria in general. This deprived the people of the positive impacts of community squares on the quality of life in urban areas, value of real estates, and settlements, (Crompton, 2007). In young people, quality open spaces are known to contribute to the physical and psycho-social development of the youths hence reduce anti-social behaviours, (Duzenli, 2001). Decisions, expression of public opinions and democratic governance of residents of communities/neighbourhoods could take place at the community squares and none availability, deprives the people of this important ingredient of a democratic society in decision making. In all the layouts in Owerri capital territory, the community squares were neither recognized, identified nor integrated into the urban fabric such that the surviving ones had been encroached upon or destroyed inadvertently. The unguided encroachment on them and at times their decimation either consciously or unconsciously posed a real problem not only to the people but to the cityscape and quality of the environment. Thus their contribution to physical planning, economic empowerment, social integration, recreation, environmental resilience, settlement and the beauty of the environment are lost. The non-integration and abuse of community squares in cities not only affects settlement patterns but defaces the cityscape in the urban areas. Hence real or perceived resistance to urban planning, location of open spaces outside the community squares manifest in environmental problems such as urban sprawl, defacing of the cityscape, slum development, squatter settlement, street trading, blocking of streets during family or community functions evident in most cities.

8. Discussion

The aim of this research was to identify the geometry in community squares in Owerri Capital Territory so as to provide a framework for their integration into emerging urban areas, for improved quality and cityscape. The research tried to address the following issues; the identification of squares, their conditions which created geometric forms such as network of foot paths, hierarchy of open spaces and their derived organic forms in the community

squares and their use as organizing systems in traditional physical planning activities in Owerri capital territory.

In objective 1, to identify differences in the conditions of community squares in Owerri capital territory, the analysis of variance, ANOVA, analysis was used to test the hypothesis on this and the test showed there were significant differences in the conditions of the community squares at 95% confidence level, (Tables 9.1, 9.3) and so the hypothesis was rejected and the alternative hypothesis that there was significant differences was accepted. The post hoc test also showed the details of the differences in of the conditions of the community squares in rural, sub-urban and semi-urban areas of the capital territory existed. (Table 9.2).

Table 9.1: Result of ANOVA test for conditions of community squares

ANOVA					
Condition of community squares					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	18.116	3	6.039	12.589	.000
Within Groups	159.741	333	.480		
Total	177.858	336			

Source; (Fieldwork, 2015)

Table 9.2: Post- hoc results of ANOVA test for condition of community squares

Multiple Comparisons				
Dependent Variable: Condition of community squares				
Tukey HSD				
(I) Location of community squares	(J) Location of community squares	Mean Difference (I-J)	Std. Error	Sig.
Rural areas	Suburban areas	.077	.097	.858
	Semi-urban areas	-.322*	.098	.006
	Urban areas	-.598*	.128	.000
Suburban areas	Rural areas	-.077	.097	.858
	Semi-urban areas	-.399*	.100	.001
	Urban areas	-.675*	.130	.000
Semi-urban areas	Rural areas	.322*	.098	.006
	Suburban areas	.399*	.100	.001
	Urban areas	-.276	.131	.152
Urban areas	Rural areas	.598*	.128	.000
	Suburban areas	.675*	.130	.000
	Semi-urban areas	.276	.131	.152

Source; (Fieldwork, 2015)

Since the number of footpaths determined the geometry in the community squares, another test to determine the correlation of the conditions of community squares and the number of footpaths in the community squares was done. The result showed that the relationship was significant at 0.05 confidence level. (Table 9.3)

Objective 2, Environmental planning indicators in Owerri capital territory and the hypothesis tested the hierarchy of open spaces and the refuse dump sites. The hypothesis tested was that there was no significant relationship between hierarchy of open spaces and refuse dump sites but a correlation existed. It was discovered that there was correlation but the relationship was not significant at 95% confidence level. The hypothesis was therefore accepted. As Owerri capital territory gets more urbanized, there is the need to have good refuse management system to protect the hierarchy of open spaces and the community squares.

Table 9.4: Result of Spearman rank correlation bivariate analysis of the relationship between hierarchy of open spaces V43 and refuse dump sites, V38

V43-hierarchy of open spaces		V-38 refuse dump sites	Remarks
	Spearman rank correlation coefficient	0.05	Not significant at 0.05 confidence level
	sig.(2-tailed)	0.18	
	N	24.23	

Source; (Fieldwork, 2015)

For objective 3, Pearson correlation analysis was used for the test and it showed there was significant relationship between the network of foot paths and the conditions of the community squares in Owerri capital territory. The hypothesis was rejected while the alternative hypothesis there was significant relationship between the conditions of community squares and the number of footpaths was accepted.

Table 9.3;Result of Pearson Correlations analysis for number of foot paths and condition of community squares

		No. of footpaths	Condition of community squares
No. of footpaths	Pearson Correlation	1	.086
	Sig. (1-tailed)		.058
	N	340	337
Condition of community squares	Pearson Correlation	.086	1
	Sig. (1-tailed)	.058	
	N	337	346

Source; (Fieldwork,2016)

The network of foot paths created lots and varieties of organic geometric forms and hierarchy of open spaces (Plates 9.1,9.2,9.3).



Plate 9.1: Amaocha Afara community square

Source: (Fieldwork, 2015)

The creation of road networks both rural, local and tarred roads follow the traditional network of footpaths and roads, as in Orie Ogbaku community square which is transversed by the Ogbaku-Oguta and Owerri-Onitsha roads (Plate;9.2).The organic geometrical forms are still part of the entire built environment.



Plate 9.2: Orié Ogbaku community square
Source: (Fieldwork,2015)



Plate 9.3: Amakaoha ubi community square

Source: (Fieldwork, 2015)

10. Findings

- i). Traditional community squares abound in urban, suburban and rural areas of Owerri capital territory with a lot of geometry and their derivatives making the community squares and the resulting morphology organic. The major condition was the existence of geometric forms which created a lot of hierarchy of open spaces, footpaths and road networks. These forms not only exist but provide basis and reinforce such concepts ecological evolution, concentric, nucleic, radial and axial principles and concepts guiding planning
- ii). The hierarchy of open spaces created by the geometric forms though correlated have no significant relationship with dump sites. However, where these public open spaces have been abused, conversion to other uses refuse dumps resulted.
- iii). The conditions of the community squares were affected by the foot paths which created the organic geometrical forms and hierarchy of open spaces used for outdoor socio-economic and socio-cultural activities.

11. Conclusion

Traditional community squares existed in the rural, suburban, and urban areas and still play strong, socio-economic and environmental planning roles in the life of the people. The geometrical forms, hierarchy of open spaces and their derivatives made the community squares very organic, less rigid. For humaneness, sustainability and resilience of the emerging Owerri capital territory, it is necessary that all identifiable community squares and their geometric forms be not only preserved but creatively integrated into urban design with the active participation of the people in the process. This would not only improve the quality of urban areas but would substantially make the design participatory, democratic and reduce discontent, disorientation and rural-urban migration. The people would see their contribution in the outcome of the urban design and would do all possible to protect and sustain the urban environment.

Traditional community squares still played and would continue to play great roles in the life of the people in Owerri capital territory and so not only needed to survive but be creatively integrated into emerging city as unlike formal public open spaces the people still use them from generation to generation. As urbanization of Owerri capital territory grows, there is the need for adequate provision of reduce management programme to avoid the abuse of the community squares as refuse dumpsites.

The difference in the conditions of the community squares from rural through urban areas which includes ample sizes, forest and green areas provides opportunity for their acquisition by government and development into modern public open spaces.

12. Policy implications

1. The government should by law identify, acquire, integrate and preserve the community squares in the emerging Owerri Capital Territory
2. Through advocacy to encourage the communities/neighbourhoods associations to protect and care for the community squares
3. Some of the community squares to be designated and upgraded into recreation parks and gardens through private and community partnership.

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