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MAPPING THE SPATIAL DISTRIBUTION AND HISTORICAL DEVELOPMENT OF CEMETERIES IN SOKOTO METROPOLIS, NIGERIA

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Abstracts

This paper examines the spatial distribution of cemeteries in the Sokoto metropolis. The study employs mixed methods, integrating quantitative spatial analysis of cemetery coordinates with qualitative data derived from archival records. Quantitative techniques were utilized to gather relevant data for this research. The information collected includes coordinates, location points, dates of establishment, and a list of cemeteries obtained from the Ministry of Religious Affairs. A total of forty-four (44) cemeteries were identified as major public cemeteries within the Sokoto metropolis. The number of cemeteries began to increase significantly in 1990, marked by the establishment of the Cemetery of Federal Science More, the last cemetery in Kurfi, which was officially recognized in 2020. This timeframe corresponds with a period of accelerated urban expansion in the Sokoto metropolis. The findings indicate that the spatial distribution of cemeteries follows a clustered pattern, concentrated in specific areas, leading to an uneven distribution. Nearest Neighbor Analysis (NNA) shows that there is less than a 1% likelihood that this distribution pattern occurred by random chance, evidenced by a Z score of 4.2. This distribution pattern suggests potential risks for easier disease outbreaks and implications for urban growth and expansion in residential areas. The study recommends the implementation of GIS-based cemetery management plans to address issues related to clustering and to establish buffer zones near rivers to mitigate the risk of flooding.

Keywords: Mapping, Spatial Distribution, Cemeteries, Sokoto Metropolis

1. Introduction

Religion influences various aspects of society, including burial methods, cemetery locations, management practices, and more, all of which depend on each culture (Lambu, 2013). Cemeteries serve an essential role in communities as places for remembrance and mourning, requiring proper planning and maintenance. Urban growth has led to increased development in cemetery areas due to population expansion, resulting in more housing in previously unoccupied regions (Mauren, 2020). This trend should not go unnoticed by town planning departments, which must recognize the importance of researching cemeteries. It is crucial to highlight patterns of urban expansion and understand how contemporary cities are affected by cemetery locations, which may have harmful environmental impacts (Alnsour, 2016; Colantoni et al., 2016).

A study of cemeteries in Sokoto is necessary to address how the local community is mismanaging these burial sites. When a property is designated for cemetery use, a "Master Plan" is typically developed to outline the layout for future burial plots,

buildings, and the infrastructure needed for the cemetery's operation and maintenance (Jones, 2012). This study aims to map the location and distribution of cemeteries in the area to facilitate proper management and future planning.

2. Concept of Islamic Burial Ground

A burial ground is a location where bodies are interred, especially one of historical significance. An ancient burial ground is synonymous with terms like graveyard, cemetery, and churchyard. The term "burial ground" can also refer to any natural or prepared site where human remains are laid to rest as part of cultural death rites or ceremonies. Burial grounds may include burial mounds, tombs, and shrines, and they can encompass various funerary practices such as cremation, inhumation, and cenotaphs (Cylia, 2022).The main difference between a burial ground, cemetery, and graveyard is that a graveyard tends to refer to a smaller cemetery, often one located next to a church. Other

distinctions include size, location, services offered, and age.

In Sokoto State, burial practices are shaped by Islamic traditions and cultural customs. According to Islamic tradition, the deceased is typically buried within 24 hours of death. In Hausa culture, burial grounds are often situated outside the city or village and are usually managed by the local community or Islamic authorities. This process often involves community participation, with neighbors and friends assisting in the preparation and burial of the deceased. The grave is prepared by digging a rectangular pit, complete with a niche (lahd) on the side for the deceased's head (Plate 1).

3. Methods

This study utilizes mixed methods to collect relevant data, drawing from both primary and secondary sources. The primary data sources include an inventory derived from a hand-held Geographic Positioning System (GPS), which was employed to obtain the geographic coordinates of various cemeteries. Information collected includes coordinates, location points, dates of establishment, and a list of cemeteries, all of which are quantitatively analyzed for mapping purposes in the Sokoto metropolis. The Ministry of Religious Affairs provided a complete list of cemeteries in the study area. The sampling frame consists of all thirty-four (34) cemeteries and their associated attendants. A total of 34 attendants from active cemeteries were interviewed. Additionally, key informant interviews were conducted with community leaders who oversee cemetery affairs. Descriptive analyses were used to interpret the maps and analyze the results. Nearest Neighbor Analysis (NNA) was employed to illustrate the geographical distribution patterns of cemeteries in the area.

4. Results and Discussion
Cemeteries in Sokoto Metropolis and their Locations

There are 44 well-known large graveyards in the Sokoto metropolis, all belonging to Muslims, along with two prominent Christian cemeteries in the area (see Table 1). Among these burial grounds, 10 have been completed and closed, while 34 are still operational. Of the 34 active graveyards, 19 are quite small and scattered across various parts of the town. The most notable graveyard is Hubbaren Shehu, where many prominent scholars, traditional rulers, and wealthy individuals wish to be buried. Thousands of visitors come to Hubbaren Shehu, where the tomb of Sheikh Danfodio is located (Abdullahi, 2015). Another well-known burial site is the Christian cemetery situated on Koko Road. Plate 1 illustrates the newly established graveyard in the Kurfi area of Sokoto South Local Government, which also serves as a place of worship and blessings for Muslims in the Sokoto

metropolis. All graveyards were mapped using coordinate picking to analyze their distribution patterns and implications within the metropolis.

Plate 1:Burial Ground in Sokoto Metropolis Showing Size of Pathways
Source: Fieldwork, 2024.

Table 1: Location of Cemeteries and year of establishment in Sokoto Metropolis

S/N	Name of Cemetries	Address	Year	Local Govt
1	Hubbare Cemetery	Hubbare Area	1817	Sokoto North
2	Christian Cemetery	Off Koko Road	1901	Sokoto South
3	Giginyoyi Cemetery	Kofar Kware	1961	Sokoto North
4	Old Tudun Wada Cemetery	Tudun Wada	1964	Sokoto South
5	Helele Cemetery	Helele	1969	Sokoto North
6	Salame Cemetery	Salame	1969	Sokoto South
7	Mana Babba Cemetery	Mana	1974	Sokoto South
8	More Cemetery	More	1977	Kware
9	Old Tsefe Cemetery	Tsefe	1977	Dange Shuni
10	Army Barrack Cemetery	Army Barrack	1981	Dange Shuni
11	Budau Cemetery	More	1982	Kware
12	Jegawa Cemetery	Jegawa	1982	Sokoto South
13	Mainiyo Cemetery	Kwannawa	1984	Dange Shuni
14	Old Guiwa Cemetery	Guiwa	1984	Wamakko
15	Gidan Maigoro Cemetery	Gidan Igwai	1984	Sokoto North
16	Gagi Cemetery	Gagi	1985	Sokoto South
17	Tsakarawa Cemetery	Dambuwa	1988	Dange Shuni
18	New Tudun Wada Cemetery	Tudun Wada	1989	Sokoto South
19	Girafshi Cemetery	Girafshi	1989	Wamakko
20	Federal Science More Cemetery	More	1990	Kware

21	Kwannawa Cemetery	Gargawo	1991	Dange Shuni
22	Runji Cemetery	G/ Road	1991	Sokoto North
23	Tamaje/Dambuwa Cemetery	Tamaje	1992	Sokoto South
24	Gidan Jariri Cemetery	Gidan Jariri	1995	Sokoto North
25	Dundaye Cemetery	Dundaye	1997	Wamakko
26	Gidan Ganau Cemetery	Gidan Ganau	1998	Sokoto North
27	Badon Barade Cemetery	Bado Area	1998	Wamakko
28	Kalambaina Cemetery	Kalambaina	1999	Wamakko
29	UDUS Cemetery	UDUS	1999	Wamakko
30	Gidan Sanda 1 Cemetery	G/Sanda	2000	Wamakko
31	Tudun Faila Cemetery	Gidan Igwai	2001	Sokoto North
32	Gidan Bahure Cemetery	Gidan Bahure	2002	Sokoto North
33	Yar Abba Cemetery	Yar'abba	2002	Wamakko
34	Tsefe Cemetery	Tsefe	2003	Dange Shuni
35	Arkilla Cemetery	Arkilla	2003	Wamakko
36	Mana Karama Cemetery	Mana	2004	Sokoto South
37	Gidan Kadiri Cemetery	Kwannawa	2004	Dange Shuni
38	Badon Gabas Cemetery	Bado Area	2005	Wamakko
39	Gunburawa Cemetery	Gunburawa	2006	Wamakko
40	Ruggar Wuro Cemetery	R/Wuro	2008	Wamakko
41	Bakin Gulbi Cemetery	B/Gulbi	2009	Wamakko
42	Gidan Sanda 2 Cemetery	G/Sanda	2010	Wamakko
43	Gwuiwa Sabuwa Cemetery	Guiwa	2019	Wamakko
44	*Sabuwar Kurfi Cemetery*	*Korfi Town*	*2020*	*Sokoto South*

Source: field work, 2024

In the past, it was quite common in Hausa land to see people building on the graves of saints, especially among followers of Sufi orders in rural areas. Some would plant trees on the graves as a means of identification, and they often built mosques nearby for prayer and seeking blessings. They would touch the graves while reciting the Qur'an and remembering Allah, all in search of blessings. However, all jurists agree that it is undesirable to construct houses, rooms, schools, or mosques on graves (Abdullahi, 2015). When it comes to burying the deceased in Hausa land, families typically wish to be interred alongside their loved ones. For this reason, many families reserve burial spaces in advance (pre-need) to ensure that their relatives are concentrated together. Additionally, many followers of various sects prefer to be buried in cemeteries where their leaders or renowned scholars are laid to rest, seeking the blessings associated with them, known as "Tabaruki." For instance, a large plot of land has been set aside at the back of the Hubbare burial ground due to high demand for burial near the tomb of Danfodio. Nowadays, many prominent individuals are reserving burial plots in the backyard of Hubbare cemetery before they pass away. Moreover, another cemetery in the Helele area, which belongs to the Tijjaniya sect, is highly sought after for burials due to the presence of renowned clerics such as Sheikh Abdullahi Wasali, the father of Sheikh Alfazazi, who are known for performing miracles (Karama) and whose remains are interred there. Many visitors, particularly from rural areas, come with

food items to offer at the graves of these saints, seeking blessings.

A representative from the Christian Association of Nigeria (CAN) stated that there are over 50,000 Christian members in Sokoto, with more than 100 churches located throughout the city. Since the first church was established in the metropolis in 1907, Christians have had only one cemetery to use. The research indicated that it has become a tradition among the Igbo and Yoruba communities in Sokoto State for church members to return the bodies of deceased individuals to their home villages or towns for burial. As a result, most Christians are not interred within Sokoto city. Additionally, Plate 2 illustrates the first Christian cemetery, established in 1907, when Lord Lugard's army conquered the Islamic empire of the caliphate.

Plate 2: Christian cemetery established in 1907 behind Saint Paul Church, Sokoto
Source: Fieldwork 2024.

Cemeteries provide essential public services, especially considering the increasing population and mortality rates. There is a growing need for larger burial plots to accommodate future needs, which is a fundamental factor influencing the necessity for cemeter

As a key element of social infrastructure, a cemetery serves as a resting place and a final home for friends, parents, and spouses—individuals whose love was once shared within the community. For those wishing to preserve the memories of their loved ones, cemeteries offer a space for continuity and provide solace and closure
. Cemeteries also facilitate social interactions during the interment process. Friends, relatives, and acquaintances from various backgrounds have the opportunity to meet, connect, and interact. This environment encourages the development of new relationships and the rekindling of old ones, both in the present and for the future. Some cemeteries even feature

multipurpose facilities designed for funeral and memorial services, further fostering community interaction. Additionally, religious leaders often take this opportunity to comfort and support the bereaved, offer encouragement, and engage in evangelistic efforts. Various religious institutions also conduct rituals in honor of the deceased to provide solace. Cultural activities associated with burial rituals can enhance social interactions during the interment process. Despite serving as the final resting place for the deceased, cemeteries provide a vital function in helping relatives find closure. The concept of social infrastructure is particularly relevant to this study, as it is crucial for the emotional and social development of individuals and communities. Urban and regional planners often consider the social impact of developments on communities. While cemeteries play significant roles in enhancing the social and psychological well-being of society, they have not received adequate attention in terms of development and maintenance, especially in the Hausa lands of northern Nigeria.

Recognizing the importance of social infrastructure, Vaznomiene et al. (2018) define it as "the interdependent mix of facilities, places, spaces, programs, projects, services, and networks that maintain and improve the standard of living and quality of life in a community." A social infrastructure comprises physical locations and organizations that shape our interactions (Richard, 2018).

Figure 1: Distribution of Burial Grounds in Sokoto Metropolis
Source: Fieldwork, 2024.

However, burial grounds in Sokoto metropolis are more concentrated in the core city because of the old system of burial where people are buried close to their associates, homes, and family land. Nearest Neighbor Analysis (NNA) for cemetery shows the cluster pattern at a 0.01 significant level.
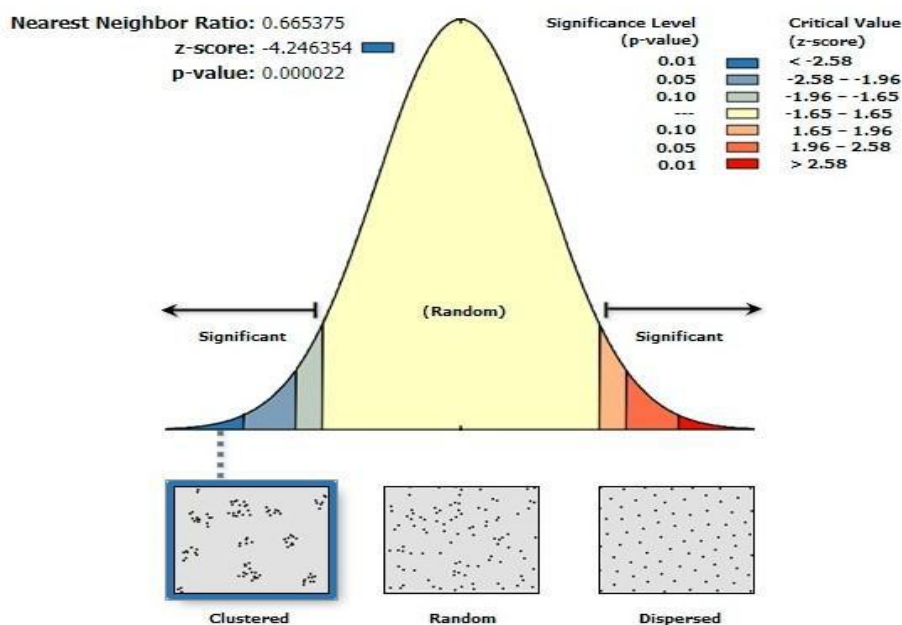
Figure 2: Nearest Neighbour Analysis for Cemeteries in Sokoto Metropolis

.The clustering pattern of distribution of cemeteries of the NNA is indicating the challenges of urban planning in Sokoto metropolis which is leading to environmental and health concerns such as water table contamination and soil pollution. Clustering of cemeteries can result in efficient land use, limiting opportunities for other land uses such as residential, commercial or recreational areas. The concentration of these cemeteries contributes to urban sprawl, as Sokoto city expands outward to accommodate growing populations. The pattern also implies social and cultural factors reflecting community identity and cultural heritage providing a sense of continuity and connection to the past. It can facilitate memorialization and commemoration of the deceased, allowing for collective remembrance and mourning.

5. Conclusion

The results of this study highlight the necessity of developing Cemetery Management Plans to ensure the proper disposal of bodies and to promote various methods of treating necro leachate. This is crucial for preventing the environmental risks that cemeteries may pose to the surrounding population. The study identified 44 cemeteries located within a 17

km radius of the metropolis, which mainly include both active and dormant burial grounds. As illustrated in Figure 1, many cemeteries are situated along riverbanks, making them more susceptible to flooding. This includes *Rugarr Liman*, *Kurfi*, *Kofar Kware,* and *Girafshi* cemeteries. The findings further indicate that the spatial distribution of cemeteries in Sokoto metropolis is clustered in specific areas, resulting in congestion near residential zones. This concentrated distribution can increase the risk of disease outbreaks and raise other environmental and health concerns, including soil pollution, urban growth, and the loss of community identity related to cultural heritage.

Challenges identified through interviews with researchers include overcrowding, insufficient funding, lack of adequate security, poor maintenance and management, inadequate water supply, absence of parking and toilet facilities, and overall insecurity

6. Recommendations

The study highlights several key recommendations for effective cemetery development. These include adopting a planning and location process, implementing security measures and adequate lighting, and establishing record and management offices within cemetery sites. It is also crucial to secure sufficient funding for operations. Additionally, there is a need to implement GIS-based cemetery management plans to address clustering issues and to enforce buffer zones near rivers to reduce flooding risks. Strong policies should be developed in collaboration with religious stakeholders such as the Sokoto Sultanate Council, *Jama'atul* Nasr'l Islam, and the Sokoto State Hisbah Board to tackle irregularities within cemeteries.

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