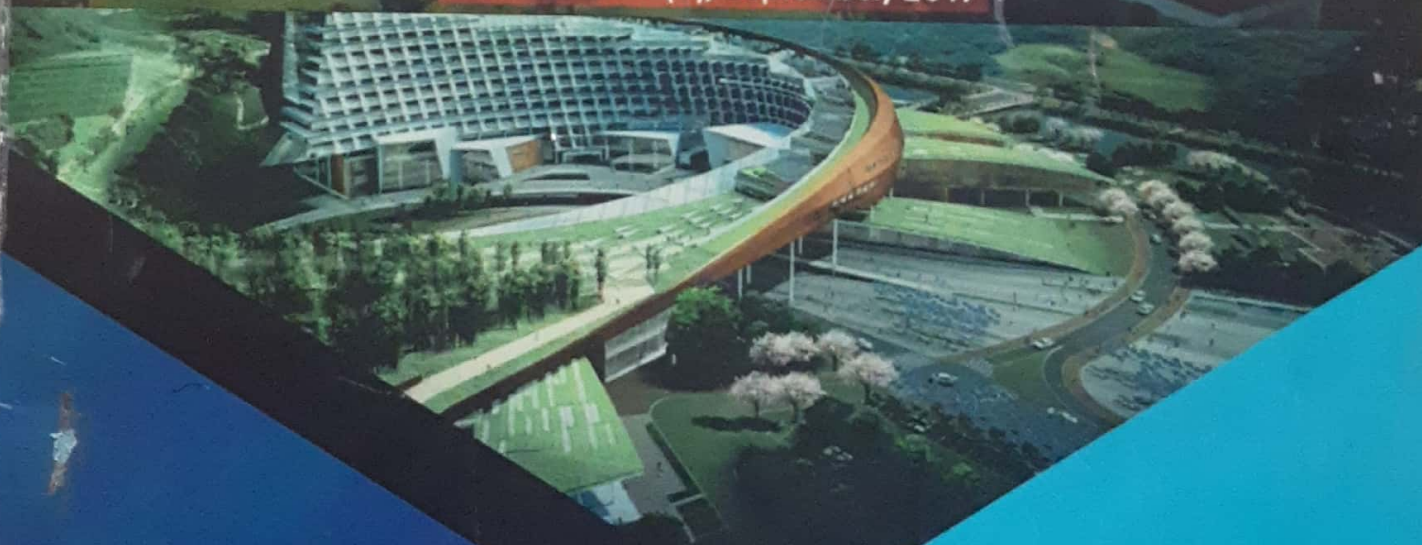




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A Journal that promotes the Architecture of Human Culture
with the Culture of Architecture

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About Archiculture Journal

ArchiCulture is an international journal that publishes original research papers, review articles and technical reports related to architecture, building science, and man's interaction with the built environment. The journal focuses on fundamental and pragmatic research aimed at promoting sustainable built environment and climate change mitigation. The journal is to provide information and encourage debate between academics and practicing professionals in all aspects of building design, construction, performance, and other related environmental issues. The journal provides an open access platform to facilitate the exchange of information between architects, engineers, and other related fields to support the advancement of environmental sustainability.

The ArchiCulture journal publishes articles that utilize conceptual and evidence-based approaches which reflect the complexity and linkages between

architecture, culture, environment, economy, society, organisations, quality of life, health, well-being, design and engineering of the built environment. We support a wide range of methodological and technical approaches including experimental, observational, monitoring and management studies and policy analysis. In addition to fundamental and applied papers, review articles on important developments will be considered. Papers considered for publication are original, high-quality papers that form a significant contribution to the theory or practice of Architectural engineering, present contemporary work on related topic, or describe a case study in which theory is applied to a significant environmental and human problem. All submitted manuscripts are subject to initial appraisal by the Editor, and, if found suitable for further consideration, will undertake peer review by independent, anonymous expert referees.

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Editorial

Archiculture: A journal that promotes the Architecture of Human Culture with the Culture of Architecture

Journal

Archiculture, as a title for this journal, is the sobriquet formed out of architecture and culture. It seeks to fuse the two phenomena into a conjoined cognomen of architecture as a living symbol of artistic, technical and utilitarian genre of expression and culture of the people, for whom architecture finds its bearing. It is the politicisation of the philosophy which believes that the quality of the built environment is determined by how much of the needs, aspirations, requirements, values and ideals, collectively known as *culture of a people* have been incorporated into its evolution. True architecture is thus considered to be that underlying philosophy of the architectural phenomenon encapsulated in the sobriquet of this epochal journal.

Because of the uniqueness of this epithet, the editorial of the maiden issue is dedicated almost entirely to unravelling the nuances of meanings that undergird its advent, much more so than the espousal of the serialization of the sequence of contributions, that has become the expected norm in most editoial exposes.

Culture, as is well known, is the totality of ideas, norms, values, beliefs, customs and social behaviour of a partivular set of people that underpin all interactions of the people and how they shape their environment. Thus, in a lot of African societies, the people view the world as a place where the living share space with the spirits of the dead and the gods. Land, trees and everything which could be regarded as property are possessed and guarded by spirits which could, from time to time, be called upon for help in appeasng the gods by trained and ordained priests or ancestors, through living relatives divinely conferred with intercessory authority in that behalf. All forms of rights and obligations, including those concerning property, such as land, which may be possessed by individuals in so called advanced societies, traditionally reside in the corporate body of the lineage, clothed with such ancestral authority.

But where culture, expressed in religious beliefs, as enunciated here, plays a central role as a strong determinant of behaviour, particularly through matters such as land, other aspects of various cultures in Africa, especially in Nigeria, have also been held to

play significant roles in people's behaviour towards organization of space and production of the living dwelling. For instance, in almost all Nigerian societies, kinship or family structure is a likely determining factor of the decision making activity in the spatial organization of the living space. Among most of the cultures, the extended family is settled in large compounds organized around a central court. This permits the expansion and contraction of the family areas in accordance with its fortunes. The house or room of the household head is usually strategically located at the entrance or in the middle of the courtyard to permit him to oversee his domain. It also usually serves as a reception hall for visitors.

Of course, little differences of variations exist amongst the various cultural groups on specific aspects of their lives which help determine the overall spatial organization and evolution of the appropriate form for enclosure and rendition of such forms in accordance with the artistic genres of the peoples concerned. All the same, the general theme can still easily be seen to manifest as a common feature worthy of some generalization. This is where the view of several experts on the whole question of organization of the living space and evolution of form with regard to that space among peoples of various cultures, traditions and sociopsychological background is noteworthy. It is to the effect that, no matter how man tries, it would be impossible for him to divest himself of his culture, because of the depths to which it has gone and the roots it has taken in his nervous system, determining how he pwrceives the world, what he believes in, how he creates elements, organizes family structure and the space within which he carries out his daily cycle of activities.

Ordinarily, this maiden issue of the *Archiculture Journal* would have focused more on the polemicization of this man culture interface in the choice of the articles for publication, in order to truly celebrate the theme of the assigned cognomen. However, the exigencies of and the demands for the need to respond to changes in the built environment brought about by technological advancement, climate change and various adverse human interventions in the natural environment have underscored the urgency for a wider focus, admitting contributions with

potential solutions in the areas of green buildings and environmental sustainability of the built environment and the eco systems. Thus, while there was a need to open up sufficient space for contributions that recognized this flexibility, as will be seen in the articles contained in this maiden issue of the *Archiculture Journal*, the need to assuage the curiosity that would obviously be aroused and

whetted at the uniqueness of this title also had to be properly addressed and contextualized.

It is our hope that subsequent issues will create and sustain the required and more manifestly enduring symbiosis between the architecture of human culture and the culture of architecture.

Professor UJI, Zanzan Akaka, PhD.
Editor-in-Chief

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Urbanization and Implication of House Water Supply in Ogbomoso, Southwest, Nigeria

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Abstract

The world is becoming increasingly urbanized and Nigeria is not left out. One of the indicators of human developments is housing and as such, water is needed by households for survival. This paper assesses sources of water used by residents as well as the implications on their health at the fringe of Ogbomoso, Southwest, Nigeria. Multistage sampling technique was used and Oke-Adunin Community was purposively selected for the study as it has large concentration of staff and students of Ladoke Akintola University of Technology. The area was captured with Google earth and two hundred and twenty two inhabited houses were found. Questionnaire was the instrument for data collection which was administered using total enumeration technique. The information collected includes socio-economic and demographic characteristics as well as sources of water supply. The study utilized both descriptive and inferential statistical analyses. More than three-fifths (66.22%) of the respondents were male and the most significant source of water used by residents was well (63.29%). Distance travelled by house owners to sources of water was as high as 5.06 meters, and the most significant socio-emotional health associated with this was stress (30.00 %). Correlation analysis between the sources of water of respondents and disease prevalence showed that rain water had very strong positive correlation with typhoid, diarrhea and dysentery, while well and water vendor only had positive correlation with dysentery and diarrhea. Recommendations were therefore, proffered towards solving the problems associated with water in the area.

Keywords: Sources of water, Water Supply, residents, Urbanization, Ogbomoso

1. Introduction

Housing is one of the indicators of human development in the world. Human development is about creating an environment in which people can develop their full potential and live productive and creative lives in accord with their needs and interests. The most basic objectives of human development are to live long and healthy lives, to be knowledgeable and to have access to the resources needed for a decent standard of living and to be able to participate in the life of the community (World Bank, 2001). An individual access to these four basic requirements of human life determines the development of that individual and it is the availability of infrastructures that guarantees that access. Thus, infrastructure is seen as including those social services derived from a set of public works traditionally provided by the public sector, to enhance private sector production and to allow for household consumption (Fox, 1994). They include services like roads, hospitals, schools, water supply, sewage etc. All these services largely determine how healthy and prosperous an individual would be and how long he will live (Fawehinmi, 2003).

Water for example, is needed by households for daily survival and is believed to cover 70% of the globe. It also covers 99% of the human body (Ahmed, Shaimaa, Gernun and Johannes, 2015). Recently, the scarcity of water is becoming a global issue and as Paul Simon, the US senator predicts, coming wars will be over water rather than oil (Thompson and Sorvig, 2007). Thus, water is now recognised as one of the most contentious, uncertain resources of the future while the world is becoming increasingly urbanized (United Nations, 2014). It is estimated that by the year 2025, 4 billion people will live in urban areas constituting 77 percent of the world's population. According to the latest UN estimates, almost all of the world's population growth between 2000 and 2030 will be concentrated in urban areas in developing countries and all of them need water for survival.

In Nigeria, the rapid rate of urbanization is noted to account for the depreciating quality of life in the country's urban centres (Olotuah, 2009). The rate of urbanization in Nigeria has witnessed tremendous increase in the last two decades. Census in the early

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fifties showed that there were about 56 cities in the country and about 10.6% of the total population lived in these cities. This rose dramatically to 19.1% in 1963 and 24.5% in 1985 and according to the country comparison report by the Central Intelligence Agency in 2011, Nigeria's population is currently estimated at 155, 215, 573 million with the urban population constituting approximately 60%. The rapid growth rate of urban population in Nigeria since the early seventies is mainly due to migration promoted by the concentration of the gain from the oil sector in the urban areas (Olotuah, 2009). While the United Nations estimates that Nigeria's population would reach 289 million by 2050, the United States Census Bureau projects that the population of Nigeria will reach 264 million by 2050. The rapid growth in population will create demand for shelter and efficient supply and distribution of basic utilities and services for the city dwellers. The effect of the explosion from the population growth will manifest in overcrowding in houses. Thus, Nigeria being one of the fastest urbanizing countries in the African continent faces a huge challenge of adequately providing affordable housing and infrastructure to its citizenry.

In the developed countries, infrastructure is controlled by public sectors to provide adequate and secure services, available and affordable to communities (Guy and Marvin, 2000). The infrastructure provision in developing countries on the contrary is solely lacking because of the ineffective relationship between all sectors involved as well as with the population themselves (Belinda, 2010). Thus, access to adequate and safe water in houses still remains a challenge in developing countries (Mkandawire, 2008) and the provision of water in sufficient amounts of acceptable quality is a basic need. Also, the sustainability and long-term supply of water to houses should be ensured. It is against this background that the study examines the sources of water used by residents at the fringe of Ogbomoso, using Oke-Adunin community, a newly urbanized area as a case study. This is with a view to ascertaining the challenges posed to the health of residents. The community is purposively selected for the study because it has large concentration of staff and students of Ladoke Akintola University of Technology, Ogbomoso.

2. Conceptualization and Review of Literature

The effect of urban infrastructure on individuals in a community should be a major concern in its provision since they are geared towards the improvement of their living standards and have economic, social and environmental effects. The social services in any community demonstrate various solutions to the problem of satisfying collective social needs.

Many cities over the world have experienced unprecedented growth during the past few decades. According to Choguill (1996), the growth is self-perpetuating and it will continue to attract people, jobs, services, interest and opportunities. The increase in population is in alignment with increase in demand for more public infrastructures. Urban infrastructure especially, water is considered an essential element if improvement is to be made to the urban environment. Lack of water could lead to serious deterioration of the urban environment such as unhealthy living environment and unaffordable services leading to unsustainable development as it is one of the foremost needs of man for his daily survival.

Most of the findings in Nigerian cities show that we are yet to meet the World Health Organization standard of a minimum consumption of 30-50 liters of safe water per capital per day (Water and Sanitation Monitoring Group, 2008). Water is a major problem in many Nigerian communities, especially in urban areas. The problem of water supply vary according to climatic and ecological circumstances.. Only about 40 per cent of Nigeria's population has access to safe water. However, whilst about 52 per cent of the urban population has access to safe water, only about 20 per cent of the rural population has access. Also, only about 25 per cent of households have access to pipe borne water. The provision water is perceived as a government responsibility for rural and urban areas (Fawehinmi, 2003).

Year Improved Water (%)

The urbanization of Ogbomoso

Ogbomoso is a pre-colonial urban center and the second largest city, both in terms of population and spatial extent, in Oyo State, Nigeria. The city is located approximately 100 km north of Ibadan, the Oyo State capital, and roughly 80 km from both Ilorin and Osogbo, respectively, the Kwara and Osun State capitals (Figure 1). It is one of the main gateways to the northern regions of Nigeria from the

Yoruba land, and is bounded by the river Ora to the east; there are no major physical barriers to the north, west and south. Ogbomoso develops laterally towards the north-south along the Ibadan-Ilorin road. The city is surrounded by a number of villages and medium sized towns such as Ikoyi, Odo-Oba and Iresa- Apa, which all have organic connections with it, but at distances considered far enough to be beyond the influence of the expansion of Ogbomoso.

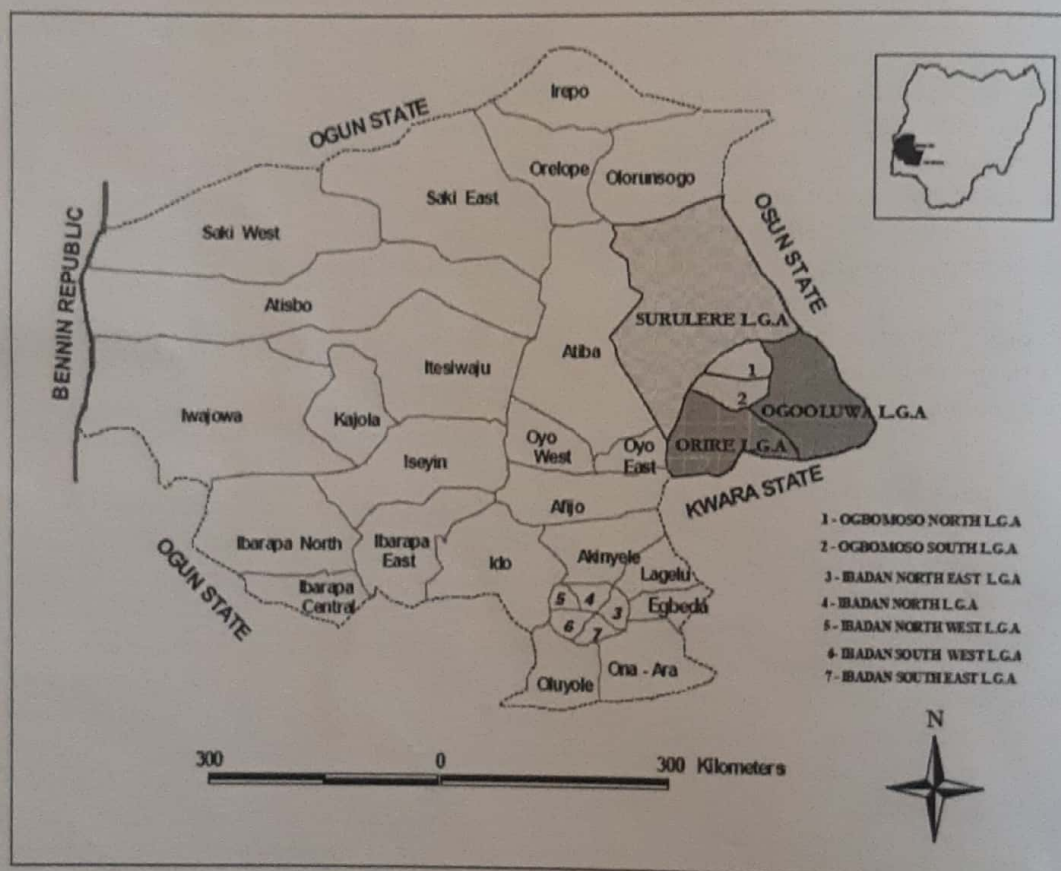


Figure 1: Regional context of Ogbomoso

Source: Ministry of Land, Housing and Physical Planning (2008)

The city of Ogbomoso is one of many Yoruba settlements situated in the south-west of Nigeria, where urbanism as a way of life predates the European colonization of the country. Like the origin and development of most Yoruba settlements in the early 18th century, the city emerged from the activities of five different waves of migrants, who settled in different areas of the present city. It was the

last wave of migrants, led by Soun Ogunlola, who as a result of their warring prowess, subjugated and pacified the separately developing villages and hamlets in the surrounding areas to form a large settlement known today as Ogbomoso.

The initial impetus behind the growth of the city was provided by a substantial influx of refugees from the internecine wars in Yoruba land in the early 19th

century and refugees fleeing the Fulani Jihadists, who overran most of the northern towns, including Ilorin, situated approximately 80 km from Ogbomoso. Ogbomoso successfully repelled the Fulani warriors and this victory further attracted other fleeing refugees to the town.

By the end of the 19th century, a continuously built-up and compact settlement had evolved from the scattered hamlets covering an extensive area of land. A quantitative description of the town carried out by Henry Townsend of the Church Missionary Society in 1855 shows that by this period, Ogbomoso had a population of approximately 40,000. While the 1952 census estimates the population of the town at 136,535, roughly ten years later, in 1963, the Figure had increased to 227,471. Although, the 1991 Census estimates the population of the town at 166,034 (a high controversial Figure), a conservative estimate of the current population of the town is 800,000. Although the river Ora is a limiting factor in the development of the town towards the east, it is clear that an important factor governing the growth and spatial structure of Ogbomoso is the Ilorin-Ibadan Federal road (trunk A), the alignment of which ensures a north-south spatial structure and the division of the town into two Local Government Areas (Ogbomoso North and Ogbomoso South) for the purpose of political administration. The 10-km

section of the Ilorin-Ibadan road represents an important Central Business District (CBD) in the city. Important roads and streets radiate from or terminate along this highway. Apart from this highway, other central business districts in the town include Oja-Igbo, where the King's palace and Ogbomoso central mosque are located (Adeboyejo and Abolade, 2007).

3. Method of data collection

The study adopts multistage sampling technique and the pattern of urbanization developed by Adeboyejo and Abolade (2007) was adopted. According to them, urbanization takes place in four out of the five local government areas that make up the city. These are Ogbomoso North, Ogbomoso South, Surulere and Oriire local government areas. Thus, the first stage involves selecting the local government area to be used for the study in which Ogbomoso North local government was purposively selected because the university is domiciled within the boundaries of the local government. The next stage involves selection of community and Oke-Adunin was purposively selected because it has large population of Ladoko Akintola University of Technology students and staff living within the area.

Table 1: Urbanization of Ogbomoso

Local Government Area (LGA)	Settlements
Ogbomoso North	Oke Adunin, Ile-Ewe, Igbo – Sayo, Oke Paku, Kuye, Ikose, Eyeba Aje Ikose
Ogbomoso South	Ayedaade, Sunsun, Saanu Aje, Safejo, Arinkinkin, Owolaake
Surulere	Ladokun, Aroje, Abaa
Oriire	Iluju

Source: Adeboyejo and Abolade (2007)

The total enumeration technique was used in which the community was first captured with Google earth and a total of two hundred and twenty-two inhabited houses were found. The instrument used for data collection was the questionnaire and was administered to a household head, harvested on the spot and complemented with observation. The questionnaire was segmented into three parts which are socio-economic attributes of respondents, sources of water and the challenges of water being encountered in the area. Data obtained were analysed with frequency counts and percentages. Pearson correlation coefficient was used to find out the

relationship between sources of water used by residents and disease prevalence in the area. The correlation coefficient is the mathematical measure of the degree of the association between two sets of variables that is, how closely two sets of data are associated. It reveals the variance of y that can associate with the variance of x . If it is positive correlation, it implies that the two sets of data progress in the same direction that is, as y increases, x will also increase and if it is negative, it implies that as y increases, x decreases.

4. Findings and Discussions

Results of investigations in this study are presented distance travelled to sources of water and water problems in the area.

(i) Socio-economic attributes of respondents

The major socio economic characteristics of the respondents drawn from the study are summarized in Table 2. The table reveals that more than three-fifths (66.22%) of the total respondents were male, while the rest (33.78%) were female. Thus, the result suggests that most of the household heads were male. Considering the age groups of the respondent, 29.73% were adults and were above 55 years of age. Only 11.72% of the respondents fall within the age range of 26 – 35 years, while almost two –fifths (36.03%) were between the ages of 46 and 55 years. This implies that there is no household head that falls below 26 years of age in the area.

Table 2 further reveals that 12.16% of the respondents had no more than primary school certificate. 36.94% had secondary education, while only 35.59% of them attended tertiary institution. Observed prevalence of literate house-owners in the study area might be due to the fact that primary education has been tuition-free in public primary schools in Southwestern Nigeria since 1955 and in public primary and secondary schools since 1979. The residents were mostly low income earners. This is evident in the fact that 42.79% of them claimed to earn below ₦20, 000 as income per month while only 9.91% of the respondent earned above ₦60,000 monthly. This result suggests that about 42.79% of the respondents earned less than the national minimum wage of ₦18,000 per month. In other words, the evidence from this finding is that, there is poverty among the inhabitants of the area.

Table 2: Socio economic background

Variable	Frequency	%
Sex		
Male	147	66.22
Female	75	33.78
Total	222	100.00
Age (years)		
26 – 35	26	11.74
36 – 45	50	22.52
46 – 55	80	36.03
Above 55	66	29.71
Total	222	100.00
Educational background		
No formal education	27	12.16

under four sub-headings: Socio-economic characteristics of respondents; sources of water,

Primary school certificate	21	9.46
Secondary school certificate	82	36.94
Tertiary institution	79	35.59
Informal	13	5.85
Total	222	100.00
Monthly Income (Naira)		
Below 20,000	95	42.79
21,000 – 40,000	47	21.17
41,000 – 60,000	58	26.13
Above	22	9.91
Total	222	100.00
Occupation		
Farming	17	7.66
Trading	83	37.39
Artisan	28	12.61
Civil servants	69	31.08
Unemployed	25	11.26
Total	222	100.00

Source: Authors' field survey (2017)

(ii) Sources of water

There were four sources of water used by residents in the area (Table 3). These are well, borehole, water vendors and rain. It was observed that water supply in the community was mainly through personal efforts and public water supply was not available in the area, except borehole. This therefore, supports the submission of Water and Sanitation Monitoring Group (2008) that water coverage rate in Nigeria is low and the country could not reach the Millennium Development Goal targets of 75% coverage for safe drinking water by the Year 2015. More than three-fifths (63.29%) of the houses use well which is typical of any community in Nigeria where the major source of water has been found to be well. A number of houses (17.70%) depend on water vendors, rain water accounts for 15.29%, while borehole was 3.72% thereby; suggesting that borehole water which is a recent and sustainable supply of water is not sufficiently available. The non-availability of borehole may be due to its cost (sinking and maintenance) because of the rocky nature of the land of the community as well as the fact that most residents of the area are low income earners. Thus, the few boreholes dug by government in the area were not functioning, while only few of the houses that dug boreholes were fortunate to encounter water.

Table 3: Sources of water

Source	Frequency (N)	Percentage (%)
Well	133	63.29
Borehole	9	3.72

Water vendors	43	17.70
Rain	37	15.29
Total	222	100.00

Source: Authors' field survey (2017).

About seven-tenths of the well (66.9%) were very functional, more than two-fifths (23.30%) were fairly functional, while almost one-tenth (9.77%) was not functional. In some cases, houses had more than a well so as to serve their needs during the dry season. The onus is on the landlords to maintain the facility and ensure they are functional. The house owners that depend on rain water during the rainy season also

depend on water vendors during the dry season and spend an average of ₦12, 000 on water in a month and could be more depending on the situation. The implication of this is that, *the more the water use, the more the money paid.*

(iii) Distance travelled to sources of water

Analysis shows that the distance travelled by house owners to sources of water ranges from 60-120 meters to 300 meters and above. It therefore, has the highest mean value of 5.06m, while the lowest mean value was 3.12 meters (Table 4). The implication of this is that, sources of water are far from their homes.

Table 4: Distance of source of water to house owners

Source of Water	60- 120 M	120 - 180 M	180 - 240 M	240 - 300 M	300 M and above	N	Total	TWV	(X - X)	(X - X ²)
Borehole	3	5	9	4	3	575	24	4.68	5.06	
Well	19	11	13	9	4	654	3.55	3.88	3.12	

WMA = Very much agree, PA = Partially agree, DA = Don't Agree, DAA = Don't agree at all
Source: Authors' field survey (2017).

However, a closer examination of the impact of the distance travelled to sources of water on the health of residents (Table 5) shows that stress ranks highest with 30.00 % and was followed by depression (25.00%) and aggressiveness (18.75%). This therefore, supports the submission of Shaw (2004) that problems such as stress, depression, annoyance among others are factor that affect emotional wellbeing of man thereby resulting into psychological problems.

Table 5: Effects of sourcing water on the socio-emotional health of Residents

Effects	Frequency	Percentage (%)
Annoyance	13	16.25
Stress	24	30.00
Dizziness	8	10.00
Depression	20	25.00
Aggressiveness	15	18.75
Total	80	100.00

Source: Authors' field survey (2017).

(iv) Water problems in the area

Correlation computation was done using the statistical correlation between sources of water of respondents and disease prevalence. Three major types of water disease were identified in the area. These are Typhoid, dysentery and diarrhea. Result of correlation analysis shows that rain water had very strong positive correlation with the three diseases in the area (Table 6), which means that, the more they use rain water, the more they are prone to typhoid (0.761), dysentery (0.523) and diarrhea (0.622). This therefore, supports the submission of Olawore (1997) that water borne diseases, which used to be synonymous with the rural areas in those days, have now become prevalent and the scourge of the urban dwellers. On the other hand, well water had very strong positive correlation with only dysentery (0.671) and diarrhea (0.587) as well as water vendor (0.890 for dysentery and 0.792 for diarrhea). This implies that the residents that depend on well water and water vendor were being highly impacted by dysentery and diarrhea, while borehole had negative effects on the health of the residents.

Table 6: Correlation of sources of water with disease prevalence

Disease	Rain water	Well water	Borehole	Water vendor
Typhoid	0.761	0.456	-0.831	0.444
Dysentery	0.523	0.671	-0.454	0.890
Diarrhea	0.622	0.587	-0.528	0.792

Source: Authors' field survey (2017).

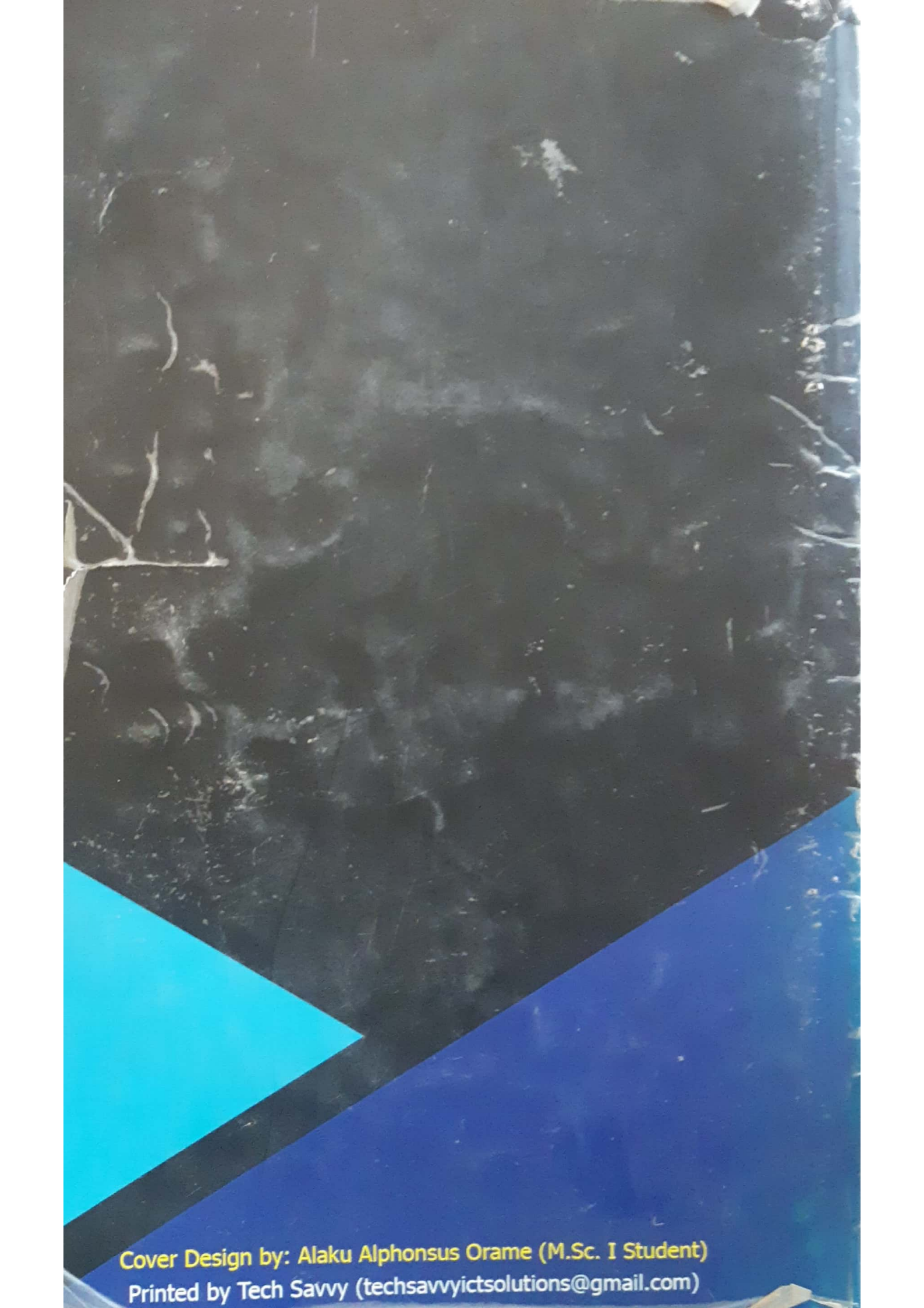
5. Conclusion

Suburbanisation is not a new phenomenon and it must be adequately addressed. This study has shown the different sources of water used by residents of Oke -Adunin Area of Ogbomoso, Southwest, Nigeria. The functionality levels were analysed, while the distance travelled to sources of water were discussed as well as the implications of the use of water on the socio-emotional health of residents. This situation is not different from any other city in Nigeria and the underlying factor of this problem is funding. Thus, there is urgent need for actions to be taken to improve water supply in the area to take care of suburbanisation. Governments both at Federal and State levels need to prioritize suburbanisation in their programmes and adequate funds should be provided by both of them annually in the budget provisions as well as maintenance fund for water supply. This fund will be useful in providing clean and potable water for the people. However, monitoring and feedback agency should be provided to monitor the effective performance of the infrastructure as well as to aid future planning.

Furthermore, the local government in charge of the community should be encouraged to make provision for water supply since this is their area of jurisdiction in order to avoid the break-out of contagious diseases such as cholera which may affect the whole of the local government. Boreholes and wells should be dug for the use of the residents with monitoring agency provided. If the water from these is sold at affordable rates, the money from it will go a long way in maintaining the infrastructure thereby having lesser weight on government in terms of maintenance of the infrastructure. Private sectors are also encouraged to aid the provision of water in terms of digging boreholes. This will go a long way in alleviating the suffering of the residents and serve as means of generating income for the supplier.

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The image shows a dark, heavily textured surface, possibly a book cover or a piece of old paper, with a mottled appearance of black, grey, and white. In the bottom left corner, there is a bright blue geometric shape, likely a triangle or a trapezoid, which is partially cut off by the edge of the image. The overall composition is abstract and high-contrast.

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