

Home Gardens and Quality of Life in Akure, Nigeria

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Abstract— *This study examines the influence of landscape elements of home gardens on self-reported quality of life (QoL) of residents towards suggesting guidelines for design decisions. This is because homes and gardens have been identified as important contiguous elements in the urban fabric. The gardens in particular are akin to the domesticated nature in cities with numerous documented advantages. However, detailed correlation studies between gardens' componential qualities and residents' overall QoL that can enhance design decisions are still largely missing in the literature. Using the World Health Organization's Quality of Life Measures (QoLM), the present study examines the components, their qualities and impact of gardens on residents' QoL in Akure, Nigeria. To achieve this, purposive sampling of homes that have gardens (n=404) was carried out in a survey and their residents' QoL examined. Inferential results suggest strong positive correlations between overall quality of the gardens' components and overall QoL. The study argues in favour of these results and recommends vibrant home gardens as panacea to vital QoL in cities.*

Keywords— *Quality of Life, gardens, plants, animal husbandry, greens.*

I. INTRODUCTION

Homes and gardens are important adjoining elements in the living environment of humans. Indeed the first home of humans is the biblical Garden of Eden where all supports for quality livelihood in an “untouched nature” were available. Unfortunately, with the advent of urbanization, this “untouched nature” has been “designed out” of the city generally and home environments in particular, though with numerous documented advantages that border on Quality of Life (QoL) indices. These include enhancing “mental health and cognitive function” of residents in buildings with gardens [1], “high level of visual fascination and mystery” [2] and improvement in “brain performance by providing a cognitive break from the complex demands of urban life” [3], among many others.

These evidence suggest the significance of biophilic design of homes which is “the use of nature to create places that are imbued with positive emotional experiences” [4] with the ultimate goal of achieving high QoL evident in pleasure, enjoyment, fascination, wonder and interest [5]. While numerous studies have been carried out on these themes in

different environments, the use of the results to guide landscape design decisions of home gardens to enhance high QoL are restricted. This is due to their general conceptual framework, lack of connection to QoL, different research settings, contexts and goals. Therefore the goal of biophilic designs is defeated given despite the continuous high rate of deforestation and its attendant negative influence on city habitability.

These issues engender three important Research Questions (RQ):

RQ1 - What is the effect of the quality of landscape elements of home gardens on residents' QoL?

RQ2 - What is the relationship between the overall quality of home gardens and overall QoL of residents?

RQ3 - What is the effect of the overall home garden experience of residents on overall QoL?

This study explores answers to these questions with the aim of examining the influence of landscape elements of home gardens on self-reported QoL towards establishing a framework for nexus between the duos to enhance design decisions. The objectives include:

1. To examine the socio-economic characteristics and QoL of residents;
2. To identify and assess the quality of the landscape elements in the home gardens and residents' garden experience;
3. To determine the relationships between characteristics of residents and home gardens.

These relationships were based on the statistical test of three null hypotheses (H₀) as follow:

H₀₁- There is no significant relationship between the quality of landscape elements of the home gardens and the self-reported QoL of residents;

H₀₂ - There is no significant relationship between the overall quality of home gardens and QoL of residents;

H₀₃ - There is no significant relationship between the overall home garden's experience of residents and overall QoL.

II. LITERATURE REVIEW

Research has shown that environmental, economic, social, physical, and health-related indicators have impacts on residents' QoL satisfaction [6]. The home garden is very prominent in the environmental domain especially of the living environment of humans. It has always been in the

form of kitchen gardens, front yard gardens and back yard gardens. Also referred to as residential yards and domestic gardens [4], home gardens “include mowed lawns, ornamental flower beds, vegetable beds, hard paths and trees” [7] which contribute largely to urban green spaces (Smith et al., 2005). Gautam *et al.* [8] argues that there is no universal definition of home garden while Kumar and Nair [9] defined it to mean “the intimate, multi-storey combination of various trees and crops in association with domestic animals around homestead”. In the view of Eyzaguirre and Linares [10] home garden includes “the management of multipurpose trees, shrubs, annual and perennial agricultural crops, herbs, spices, medicinal plants, fish, and animals on the same land unit, in a spatial arrangement or on a temporal sequence”. They have always met the multipurpose needs of households [11].

A. World Health Organization (WHO) Quality of Life Indicators

This study is based on the WHO’s definition of QoL as “an individual’s perception of their position in life in the context of the culture and value systems in which they live, and in relation to their goals, expectations, standards and concerns” [12,13]. The measures of QoL according to this definition have been explored in many studies and in different contexts [14,15]. These measures are inclusive of all the indicators of QoL with different mixes as evident in the literature. For instance, QoL has been measured as the four domains of physical, psychological, social, and environmental wellbeing [16], life satisfaction and subjective wellbeing [17], among objective and subjective experiences of living environment [6], among others. Most of the studies are general in conceptual design while a few are specific. For instance Parker et al [18] studied “Quality of Life and Building Design in Residential and Nursing Homes for Older People” where architectural design of buildings and building interiors only were considered. Ogunseitan’s [16] study was specific on “Topophilia and the Quality of Life” with emphasis on “individual preferences for specific ecosystem components and restorative environments”. Spyker’s [19] thesis on the theme is also deficient in using fine-grained classification of landscape elements that are needed for design purposes. This study therefore sets out to bridge this gap in the literature on the nexus between home gardens and QoL towards biophilic landscape design of residential environments.

According to the World Health Organization Quality of Life Assessment (WHOQOL) Group [13], the physical environment in which we live is a recognised dimension of the quality of life. The World Health Organization (WHO) therefore identified six factors that span the physical and psychological realms of life quality [20]: the physical domain (measures pain, energy and sleep), the psychological domain (measures positive feelings, concentration, self esteem, body image and negative feelings), the independence domain (measures mobility, activities of daily living, medication and work capacity), the social domain (relationships, social support and sexual activity), the environment domain (safety, home, finances, social care, new information, leisure,

environment, transport), and finally the spiritual domain which has only one factor, spiritual.

In the environment domain, the home is not only crucial but central since more time is spent in the home than work and leisure environments while for others who are engaged in self-employment and some forms of informal activities the latter two are subsumed in the former. In the home, the outdoors occupies more space than indoors and therefore very significant to QoL. In a model of QoL by Mitchell [21], these components appear as follow: health (mental and physical), physical environment (nuisance, visual perception and scenic quality, climate, pollution), natural resources goods and services (natural resources, goods, social infrastructure and services) community development (community structure, social networks and group relations, political participation) personal development, (individual development through recreation and leisure, through learning) and security (personal economic security and standard of living, housing, administration of justice crime and safety).

The home environment and the mind environment are therefore central measures of QoL and the duos are parts of holistic ecosystem where the human nature interacts with the non-human nature [22,23,24] as measures of self-reported well being [20]. Accordingly, “positive emotions may contribute to physical health in several ways (e.g. analgesic immune-enhancing effects), but they also directly affect psychological well-being by making people feel better emotionally,” [25]. To emphasize the significance of the duos of the environment and QoL, Newman’s [23] model considers health as an indicator of liveability and “environmental quality is treated as determinant of health” [26]. Highest satisfaction is therefore reported for lots that directly border nature areas [27].

B. Quality of Life and Home Gardens (QoL)

Quality of life (QoL) is a concept that has inspired much research in the past decades [28,29,30] and in particular QoL as implicated from quality of the physical environment in residential areas [31]. With regard to green components of home gardens, life satisfaction has been found to be enhanced by the mere presence of plants and improve life satisfaction [32]. McFarland, Waliczek and Zajicek [33] found that the overall QoL of university students correlated with use of green spaces. Ghosh [34] argued that gardens are important elements of residential environments and they have “significant sustainability potential similar to that of dwellings”.

III. RESEARCH METHODS

The study was carried out in the urbanized areas of Akure South and Akure North Local Government Areas of Akure, excluding the peri-urban areas. Akure is a Millennium Development Goal (MDG) city in Nigeria located on latitude 7°25’N and longitude 5°20’E with population of 500 000 in 2006 [35]. In view of the scantiness of green spaces generally in the city, purposive sampling of homes that have gardens was carried out in the enumeration method survey.

The sample size was determined through the approach based on precision rate and confidence level recommended by Kothari [36] for infinite population. The study population was judged to be infinite due to the unavailability of reliable current data on number of homes in the study area. Therefore, the minimum sample size for the study was calculated as

$$n = z^2 \sigma^2 / e^2 \quad [36]$$

Therefore, the minimum sample size in view of the desired precision rate and confidence level is 238.

The sampling instrument was a questionnaire designed to collect information on the socio-economic characteristics and QoL of residents and evaluation of landscape elements in the home gardens. The most obliging resident in each sampled home was interviewed. While gender, education, social, marital and work status were measured nominally, age was measure as interval variable. The landscape elements were considered in groups and each categorized to the usual design components in nominal scales. The QoL questions were based on well-being items of the World Health Organizations' QoL Indicators in two categories. The first category in ordinal 5-point likert scale consists of eight questions on health satisfaction, feelings about life, emotions and opportunity for leisure activities. The second category in ordinal 10-point likert scale consist of three questions where respondents were asked to rate their overall garden landscape, garden experience and QoL.

The data obtained were subjected to descriptive and inferential analyses using SPSS 16. While the descriptive was on frequencies, percentages, means, mode, median, standard deviation and variance for all the nominal and interval data, Spearman's rho rank order correlation was used for the ranked data to test the three null hypotheses.

IV. ANALYSIS, RESULTS AND DISCUSSION

A. Socio-Economic Characteristics of Respondents

Table I reports the Socio-Economic Characteristics of Respondents. Out of the total sample size of 100%, 57% were males while 43% were females. Their age distribution is as follow: Under 25yrs, 16%; 25 - 50yrs, 68%; 51 - 70yrs, 15%; Over 70yrs, 1%. The distributions of their educational status are: No former education, 19%; Primary Education, 5%; Secondary School, 21%; ND/NCE,13%); HND/B.Sc., 32%); others, 11%. Furthermore, the marital statuses of the respondents are as follow: Single, 40%; Married, 59%); Widow, 1%); Divorced, 1%; Separated, 1%. On the self-reported perception of the social status of the respondents, the following reports were obtained: Lower Class, 11%; Middle Class, 80%; Upper Class, 9%; Upper-Upper Class, 1%. The natures of work of the respondents are: Unemployed, 4%); Retired, 19%; Permanent, 42%); Temporary, 3%); Casual, 32%. These results suggest a varied socio-economic distribution of the respondents that may be relied upon for generalisation of other results from the analyses of the data.

TABLE I: SOCIO-ECONOMIC CHARACTERISTICS OF RESPONDENTS

Socio-economic Variables	Frequency	Percent.	Socio-economic Variables	Frequency	Percent.
Gender			Marital Status		
Male	231	57.2	Single	159	39.4
Female	173	42.8	Married	237	58.7
Total	404	100.0	Widow	5	1.2
			Divorced	2	0.5
			Separated	1	0.2
			Total	404	100.0
Age			Status in the Society		
Under 25	65	16.1	Lower Class	45	11.1
25 - 50yrs	276	68.3	Middle Class	322	79.7
51 - 70yrs	60	14.9	Upper Class	35	8.7
Over 70yrs	3	0.7	Upper -Upper Class	2	0.5
Total	404	100.0	Total	404	100.0
Educational Status			Nature of Work		
No former education	77	19.1	Unemployed	16	4.0
Primary Education	21	5.2	Retired	76	18.8
Secondary School	83	20.5	Permanent	169	41.8
ND/NCE	50	12.4	Temporary	13	3.2
HND/B.Sc	129	31.9	Casual	130	32.2
Others	44	10.9	Total	404	100.0
Total	404	100.0			

Source: Authors Field Survey, 2013

B. Correlation Analyses of Overall QoL and Quality of Landscape Elements of the Home Gardens

Tables II and III show the results of the Spearman's rank order correlation analyses among overall QoL, garden landscape elements and garden experience. At 99% confidence level (2-

tailed), there is a high positive significant correlation coefficient of 0.533 between overall QoL and overall garden landscape. This suggests that high QoL of residents can be achieved through high quality landscape of home gardens. Similarly, a positive correlation coefficient of 0.369 exists between overall QoL and overall garden experience of

residents. Also, overall garden landscape and overall garden experience are positively correlated at 0.263 at 99% confidence level. The most likely implication for landscape design of home gardens is that the overall landscape quality of

home gardens has direct positive impact on the quality of garden experience of residents which in turn has positive impacts on the QoL of residents.

TABLE II: CORRELATION OF SELF-REPORTED OVERALL QOL, GARDEN LANDSCAPE AND GARDEN EXPERIENCE

		Overall garden landscape	Overall garden experience
Spearman's rho	Overall Quality of life	.533**	.369**
	Correlation Coefficient	.000	.000
	Sig. (2-tailed)	.000	.000
	N	404	404

** . Correlation is significant at the 0.01 level (2-tailed).

Source: Authors' Field Survey (2013)

TABLE III: CORRELATION OF SELF-REPORTED OVERALL QOL, GARDEN LANDSCAPE AND GARDEN EXPERIENCE

		Overall garden experience	Overall Quality of life
Spearman's rho	Overall garden landscape	.262**	.533**
	Correlation Coefficient	.000	.000
	Sig. (2-tailed)	.000	.000
	N	404	404

** . Correlation is significant at the 0.01 level (2-tailed).

Source: Authors' Field Survey (2013)

C. Correlation Analyses of QoL and Quality of Landscape Elements of the Home Gardens

Table IV shows the *Spearman's rho* correlation values between self-reported QoL as dependent variable and landscape elements of the home gardens as independent variables. In a descending order, the values are: short trees, 0.468; tall trees, 0.265; flowering trees, 0.242; animal husbandry, 0.153; shading trees, 0.150; medicinal trees, 0.145; medicinal shrubs, 0.139; flowering shrubs, 0.129; water body, 0.121 and grass lawn, 0.106. Since all the coefficients are positive, the implication is that the more the measures of the landscape elements of the home gardens, the more the QoL of the home residents.

These results not only suggest the rate of the influence of each landscape elements of the home gardens on the QoL of residents but also the order of significance of the elements in achieving the best QoL. This implies that trees that normally grow short at full age should not only be ensured are incorporated into the landscape design but should be properly located for the best views of residents depending on the window openings of the building, the overall site planning and general outdoor space layout. This may be due to the fact that short trees can enhance an optimal visual contact of concentrated greens from indoor and outdoor spaces of homes especially when they have compact foliage. Their height scale is also very compatible to the human height scale and species can be selected to provide varieties of visual amenities to the entire home garden landscape. In this way short tree may provide the best contact with nature at humanly efficient standing sight lines.

The next high value of Spearman's rho coefficient of correlation is for tall trees which are at buildings' scale. They not only provide a balance in scale between built forms and plant materials but can also enhance comfortable indoor environmental temperature in addition to serving as wind breakers. With very thick foliage system they can protect major parts of the home building from excessive solar insolation. Flowering trees has the third highest value. They provide varieties of colours to the entire landscape of the home garden and break the green colour monotony of most gardens. The scents of the flowers provide natural aroma to the landscape in addition to the balance they provide to the entire ecosystem through the insects that feeds on the flower nectars.

The result suggests a fourth position to animal husbandry in the home gardens. While they may create health challenge to the home residents in cases of lack of proper maintenance culture, they are sources of nearby animal protein sources in a fresh and unrefrigerated manner to the home residents and therefore have the potential of enhancing QoL. Other results suggest that shading trees, being in the fifth position, is also important to good QoL.

TABLE IV: CORRELATION COEFFICIENTS OF QOL AND QUALITY OF LANDSCAPE ELEMENTS OF THE HOME GARDENS

<i>Spearman's rho</i> values	QoL	Remark
Shading Trees	0.150**	5th
Tall Trees	0.265**	2nd
Short Trees	0.468**	1st
Flowering Trees	0.242**	3rd
Medicinal Trees	0.145**	6th
Flowering Shrubs	0.129**	8th
Medicinal Shrubs	0.139**	7th
Grass Lawn	0.106*	10th
Water Body	0.121*	9th
Animal husbandry	0.153**	4th

** . Correlation is significant at $p=0.01$ level (2-tailed).

*. Correlation is significant at $p=0.05$ level (2-tailed).

Source: Authors' Field Survey (2013)

. This can possibly be through proving outdoor recreation spaces under the shades of the trees and thereby encouraging healthy social interaction among the home population. The sixth and seventh positions are for medicinal trees and medicinal shrubs respectively. Since medicinal plants are natural well-being enhancers, their incorporation into the landscape design of home gardens will ensure better QoL of residents. Flowering shrubs has the eighth high spearman coefficient of correlation with QoL. Their general human scale places them in better visual advantage than flowering trees and

can serve better psychological well-being purposes than them in that regard. Water body and grass lawns are respectively in the ninth and tenth positions and have high potentials in providing soothing and softening effects within the landscape.

Table V shows the correlation matrix of QoL measures as dependent variables as quality of landscape elements of the home gardens as the independent variables. While two of the measures are negative measures of QoL, that is the need for medical treatment to function and experience of negative feelings, the others are positive measures. These two are either mostly negatively correlated or not significantly correlated.

TABLE V: CORRELATIONS MATRIX OF RESPONDENTS' QOL MEASURES AND QUALITY OF LANDSCAPE ELEMENTS OF HOME GARDENS

Spearman's rho Sig. (2-tailed) N	Shading Trees	Tall Trees	Short Trees	Flowering Trees	Medicinal Trees	Flowering Shrubs	Medicinal Shrubs	Grass Lawn	Water Body	Animal husbandry
Do you need medical treatment to function?	-0.189**	0.002	0.222**	0.129**	0.220**	0.410**	0.163**	0.132**	0.117*	0.132**
Do you enjoy life?	0.016	0.124*	0.448**	0.356**	0.292**	0.373**	-0.004	0.078	0.099*	0.044
Do you feel life to be meaningful?	0.272**	0.433**	0.159**	0.379**	0.056	0.225**	-0.129**	0.024	-0.023	0.035
Do you have enough energy for daily life?	0.001	-0.019	0.244**	0.379**	0.048	0.379**	0.056	0.232**	0.028	0.108*
How often do you experience negative feeling?	-0.534**	-0.593**	-0.229**	-0.269**	-0.320**	-0.195**	-0.079	-0.055	-0.035	0.020
Please rate your health satisfaction	-0.081	-0.080	0.370**	0.300**	0.370**	-0.082	0.134**	0.148**	-0.024	-0.174**
Please rate your opportunity for leisure activities	0.022	0.175**	0.560**	0.407**	0.483**	0.407**	0.179**	0.119*	0.104*	0.026

Source: Authors Field Survey, 2013

** . Correlation is significant at $p=0.01$ level (2-tailed).

For instance, the value of -0.534 between experience of negative feelings and tall trees implies that increase in measures of tall trees will lead to decrease in the experience of negative feelings and vice-versa. The highest correlation coefficient on the positive side that is significant at confidence level of 99% (i.e. $p=0.01$, 2-tailed) is 0.560 for opportunity for leisure activities and tall trees. This implies that increase in measures of tall trees increases opportunity for leisure activities by providing necessary outdoor spaces in comfortable environments. Furthermore, presence of flowering and medicinal trees and shrubs reduces the incidences of negative feelings, as increase in flowering trees brings increases meaning to life, energy for daily life and health satisfaction, among others.

V. CONCLUSION

Homes and gardens should be made creatively contiguous in the living environments of humans in cities for the best QoL outcomes. This becomes necessary in view of the numerous benefits that enhance the well-being of residents. In particular, there is need to pay close attention to the plant mixes, varieties and their locations in the landscape design of home gardens in compatible spatial functioning of the general landscape planning of the home site. This study has revealed that the

quality of home gardens has effects on the QoL of residents. Therefore, vibrant home gardens are not only serving the purposes of ecological balance and environmental sustainability, they serve as panacea to vibrant QoL in cities. However, the analyses of the data in this study excluded the complexities of the filtering process of socio-economic variables on the effects of home gardens on the QoL of residents. Further studies with more expanded study areas and robust data can be carried out in that direction. The outcomes of such study can enhance landscape design decisions of housing facilities at higher spatial scales.

On the whole, the unfortunate circumstances of treating the home grounds as left-over spaces used for undefined purposes should be avoided. All indoor spaces should have their compatible outdoor spaces zoned for living, service and sleeping while home gardens as general garden, kitchen garden, recreation and amusement garden, and gardens for spiritual and meditation purposes should be given utmost priority to achieve the best QoL of home residents.

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