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EFFECT OF ENVIRONMENTAL QUALITY ON RESIDENTIAL PROPERTY RENTAL VALUE IN BIRNIN KEBBI, KEBBI STATE

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ABSTRACT

Purpose: *Environmental attributes are important determinants of real estate value and are a critical factor in determining the prices of residential property. This study aims to investigate the effects of environmental quality on the rental value of residential properties in Birnin Kebbi, Nigeria.*

Design/methodology/approach: *To achieve this aim, determinants of environmental quality were assessed alongside the rental value of residential properties in the study area. A stratified random sampling technique was employed in the administration of the questionnaire on a sample size of 1,067 out of the 304,113 sample frame of the study population. Of the administered questionnaires, 580 were retrieved (54.5%), which was adjudged adequate for the study. Both descriptive (mean, average weighted mean) and inferential statistical (Spearman's correlation) tools were adopted for analysis.*

Findings: *The result revealed that the correlation coefficient (r) obtained was 0.344, indicating a positive but weak relationship between environmental score and rental value. And the significant level (p) of 0.450 obtained was greater than 0.05 (95% confidence level), indicating insignificant correlation between environmental score and rental value. The study revealed that there is no significant effect of environmental factors on the rental value of residential properties in the study area.*

Research limitation: *Determinants of environmental quality were based on the concepts of urban environmental quality; however, the adopted variables were limited to safety/security, drainage, waste disposal system, road network, power supply frequency, water supply, pollution and neighbourhood cleanliness.*

Practical implication: *The study recommended the need for greater research into how environmental quality, in combination with common characteristics of the residential property market, might help explain variation in the rental value of residential property within a particular area.*

Originality/value: *The study revealed areas with low mean environmental score having a higher or are at par with the mean rental value of areas with high mean environmental score. The study thus advocates for more study on this line.*

Keywords: Neighbourhood attributes; Environmental quality; Residential property; Rental value.

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1.0 INTRODUCTION

Environmental attributes are important determinants of real estate value, and are a critical factor as regards the prices of residential property (Madushani, Peiris & Jayasinhe, 2019). The wellbeing of residents in any geographical location or area is directly linked with the quality of the environment (Kamp, 2003; Ambali, 2011). Environmental quality is a set of properties and characteristics of the environment, either generalized or local, as they impinge on human beings and other organisms. According to Jiboye, 2010; Agabi, & Odekunle 2014, the efficiency of any form of human activity system, including an urban area, largely depends on the provision of the efficient infrastructural facilities and services. These in turn, are part of the environmental qualities of that area where they are provided.

Environmental features significantly contribute to the prices quoted on local property markets. Thus, the presence of environmental attributes and the arrangement of those spatial features directly affect buyers' attitude and the value of property. Environmental attributes are largely categorized into structural (physical characteristics), locational and neighbourhood attributes (Yusof & Ismail, 2012; Samy, 2015). In recent years, increasing concern about environmental quality has grown in tandem with rapid urbanization. The concepts of urban environmental quality, livability, quality of life and sustainability enjoy a great public popularity forming a central issue in academic discuss (Ardeshiri, et al. 2016).

Urban infrastructure covers a wide range of services and facilities, namely electricity, water, roads, waste disposal, drainage, hospital, schools. Where urban infrastructure is adequately provided and efficiently managed, productive and profitable land uses are usually attracted towards such areas. This in turn usually results in an increase in land and housing values; whether sales or rentals (Mba,1996). The quality of that environment in which residential property is located, largely affects the decisions made on the real estate market (Maantay, 2001). This is said to influence the value of the property and its social capital economic benefits. It is also said to be largely responsible for value of property, and also delivers a high quality of life.

Birnin-Kebbi the capital of Kebbi state is currently undergoing a modern facelift befitting a state capital occasioned by the massive construction work ongoing in the metropolis. The construction activities which include road construction, public and private commercial building construction, have consequently given rise to the influx of migrants into the town in search of employment. However, the facelift and infrastructural development is not evenly spread across the city. While some areas or locations witnessed sparse new developments, others have witnessed so much new developments; thus, resulting in uneven distribution of environmental quality. Recent disturbances in the nearby states have also resulted in people moving from such states to settle in Birnin-Kebbi. With this scenario, one will expect property value to differ from one location to another, given the fact that environmental quality affects property value, based on the literature, and conclusion of

several authors. However, a cursory look at the property market in BirninKebbi seems not to reflect this as the value of properties in environmentally less developed areas still compares with the value of properties in environmentally more developed areas. Therefore, this begs the question: does environmental quality really determine or affect value of residential property? The study therefore, investigates the effect of environmental quality on rental value of residential properties in BirninKebbi.

2.0 LITERATURE REVIEW

Environmental quality has been investigated through analysis of the evaluative responses people have toward specific environmental features. These features which are perceived environmental qualities, such as an array of features of their socio-physical environment include neighbourhoods attributes such as neighbourhood infrastructure, neighbourhood cleanliness, safety and security, Greenery and friendliness of neighbours. Neighbourhood facilities for instance can be a great source of satisfaction or dissatisfaction to the overall residential environment. Also, studies have revealed that many variables affect neighbourhood quality. Julius (2002), posited that, ancillary services, environmental amenities and social infrastructures like water, electricity, road, drainage, sewage and waste treatment facilities, personal safety and security among others, are strong factors that affect neighbourhood attributes. The quality of life and health of urban dwellers depends significantly on the quality of the urban environment, including quality of air and drinking water, functioning in a complex system of interactions with social, economic and cultural factors. Environmental psychology (Bonaiuto, 2004; Paez, 2009) and related disciplines that focus on people's quality of life have addressed the relationship between inhabitants and their neighbourhood of residence in the urban environment. Kellekci and Berkoz (2006) in their study adopted characteristics of the residential environment as one of the indicators, which includes lighting, maintenance of open areas, traffic density, user density, building density, housing environment facilities, education facility, medical and health facility, retail service, shopping and sport facilities.

Vincenza, Leonardo, Mario and Michele (2014) applied a Neural Network based model for real estate price estimation considering environmental quality of property location. The findings revealed that the most significant variables are those related to property special features such as proximity to the beach or presence of a garden or terrace while, the most significant environmental variable is the maximum value of measured environmental polluters (μg/m3 293°K). Asmma'Che, Megat, Megat and Maryanti (2015) studied the impacts of Indoor Environmental Quality (IEQ) elements on residential property market. Broad literature regarding the impacts of IEQ for residential building property and its implication towards property price and rental were reviewed. The study revealed that IEQ features indirectly increase residential property market price and rental value. Ardeshiri, et al. (2016) evaluated the values and benefits of environmental elements on housing rents. Using Hedonic Pricing (HP) and Life Satisfaction (LS) as methods of analysis, the findings indicated that housing markets revealed a wide set of neighbourhood characteristics which also suggested that Shiraz neighbourhoods were likely to be characterized by deep economic segregation.

Wokekoro (2020) assessed the impact of noise pollution (which is an environmental factor) on rental values of properties in Nigeria. The data were analysed with descriptive statistics such as frequency, percentage and mean. The results revealed that noise pollution reduces property rental values with a mean of 2.7 which is greater than the mean rating of 2.5. The study concluded that noise pollution negatively impacted property values. Ayeni, Kemiki, Popoola& Musa (2022) assessed the contribution of environmental attributes to residential property rental value in Abuja. Environmental attributes were scored based on current condition and ratio scale was used alongside the average property value. The result revealed that neighbourhood attributes contributed between 60.3% -71.6%, natural attributes contributed between 60.3%-71.7% while structural Effect of Environmental Quality on Residential Property Rental Value in Birnin Kebbi, Kebbi State attributes contributed between 66.8%-75.1% in determining the property values across the selected areas. The quality of the urban environment as a living space for the people worldwide has emerged as an issue of fundamental concern for academic researchers, policy makers and citizens as the world's population largely lives in urban places. It had been established through research that environmental quality play's crucial role in the determination of real property values. The question is; has the quality of the environment in different locations in Birnin-Kebbi affected the rental value of residential properties? This study seeks to provide an answer to that question.

3.0 AREA OF THE STUDY

Birnin-Kebbi became the capital of Kebbi State in 1991 following the creation of the state out of the South Western half of old Sokoto State. Though the town was mainly a Hausa and Fulani settlement, it is now heterogeneous with persons from different ethnic backgrounds now residing in the state. Some of these ethnicities include: Sabarman, Kambari, Yoruba, Igbo, Nupe and Edo among many others. The city, before now was an area with a low degree of urbanization, it was predominantly of natural suburbs and agricultural landscape. In 2006 the population figure was 115,447 for Birnin-Kebbi local government of which Birnin-Kebbi is the only settlement (municipal local government) and in 2016 it was 366,200. The United Nation World Urbanization Prospects put the population of the city presently (2025) at 445,671 (Word Population Review, 2025). The demand for housing in the town rose significantly as a result of physical and social transformation witnessed by the town in recent years. The need to give the town a modern facelift befitting a state capital occasioned the massive construction work ongoing in the city including roads rehabilitation, public building construction and refurbishments, residential quarter's construction and refurbishment, and drainage construction. These have consequently given rise to the influx of migrants into the town in search of employment. Recent disturbances in the nearby states have also resulted in people moving from such states to settle in Birnin-Kebbi (the state capital) which is relatively peaceful.

4.0 METHODOLOGY

The study population was made up of residents of the study area with a sample frame of 304,113 according to the register of Kebbi State Independent National Electoral Commission (2023). The sample size of 1,064 was established using the sample size table developed by Dillman (2007) which is an improved version of the formula by Salant and Dillman (1994), this formula has been explored to develop the required sample size table for different categories of population sizes. Dillman (2007) model for estimating desired sample sizes is as given below:

$N_S = \frac{(Np)(p)(1-p)}{(Np-1)(B/C)2+(p)(1-p)}$ ……………………………………………………………….*(i)* where:

N_s = completed sample size needed (notation often used is *n*)

N_p = size of population (notation often used is *N*)

p = proportion expected to answer a certain way (50% or 0.5 is most conservative)

B = acceptable level of sampling error (0.05 = 5%)

C = *Z* statistic associate with confidence interval (1.96 = 95% confidence level)

The study adopted stratified random sampling method and divided the study area into seven (7) strata namely, Takalau, Badariya, Bayankara, GRA, Gwadangaji, NEPA and Gesse I&II (table 1), and within each zone, sampling was done randomly with replacement. The study made use of questionnaire to solicit and extract necessary information from the study population. A total of 580 questionnaires were returned out of 1064 administered, these represents 54.5% (table 1) and presumed to be adequate for the study. Environmental attributes were scored based on current condition using likert scale to establish the environmental average weighted mean scores alongside the average mean property value (see Appendix).

Table 1: Questionnaire administration

Zone	Sample frame	%	Sample size	Nos. of questionnaires retrieved	% retrieved
Takalau	40,048*	13.17	140	74	52.63
Badariya	47,920*	15.76	168	92	57.24
Bayan-kara	42,560*	13.99	148	81	54.61
GRA	38,675*	12.72	135	68	50.66
Gwadangaji	38,155*	12.55	134	63	48.03
NEPA GRA	47,954*	15.77	168	95	56.58
Gesse I&II	48,801*	16.05	171	106	61.84
Total	**304,113***	**100**	**1064**	**580**	**54.51**

Source; Kebbi State INEC; Field survey 2023.

5.0 PRESENTATION AND DISCUSSION OF RESULTS

5.1 Evaluation of environmental quality

To evaluate the quality of the environment, 5-point likert scale was used based on the perception of the respondents on the condition of the various determinants in their various locations. The evaluation and scoring method are presented in table 2.

Table 2: Evaluation and scoring (likert) scale

Determinants of Env. Qual.	Assessment and Score 5	4	3	2	1
Safety/ Security	Very adequate	Adequate	Fairly adequate	Poor	V/poor

Drainage	Covered Conc. Type	Concrete type	Plastered block type	Block type	Gutter
Waste disp. System	Collection	Vendor	Dump site	Burning	Open space dump
Road	Very good	Good	Fair	Poor	Very poor
Power supply freq.	Very Regular	Regular	Fairly Regular	Irregular	Very irregular
Water supply	Pipe borne	Borehole	Covered Well	Open Well	Vendor
Neighbourhoo d cleanliness	Very Clean	Clean	Fairly Clean	Dirty	Very dirty
Pollution	Very Low	Low	Fair	High	Very High

Author's design 2023

Takalau Badariya B/Kara GRA Gwadangaji NEPA Gesse I&II Safety/ Security 3.71 2.18 2.23 2.98 2.26 2.26 3.73

Drainage Effect of Environmental Quality o2.76 3.03 n Residential Property Rental Value in Birnin Kebbi, Kebbi State 2.68 2.63 1.80 1.53 2.90

Waste disposal System	2.69	2.28	2.43	2.03	1.59	1.78	2.36
Road	3.18	3.03	2.54	3.96	1.98	1.31	4.20
Power supply freq.	3.13	3.11	1.96	2.85	1.98	1.93	3.81
Water supply	3.36	2.99	3.15	2.66	2.61	2.68	3.43
Neighborhood cleanliness	2.75	3.06	2.74	3.05	1.90	1.80	3.20
Pollution	2.81	3.35	2.06	3.30	1.78	1.51	2.99
Average	**2.71**	**2.71**	**2.47**	**2.93**	**1.71**	**1.85**	**3.33**

5.2 Evaluation of the Environmental quality of different locations in the study area Using 5 5-point Likert, the average weighted means (AWM) of environmental quality determinants in various locations was established as presented in Table 3 (see detailed calculation in the appendix). These represent the environmental quality of the locations. Table 3: Average Weighted Means (AWM) of Environmental Quality

Weighted Mean

Source: Field survey 2023

The evaluation of the responses showed that average weighted mean which is presumed to be the environmental quality of the location was 3.33 for Gesse I&II, followed by 2.93 for GRA and 2.71 for Takalau while, NEPA has 1.85 and Gwadangaji 1.71.

5.3 Rental Value of Residential Properties in the Study Area

Average rental value of different types of residential properties in each location was also established, from these the mean of the average rental value was calculated and were presented in Fig. 1.

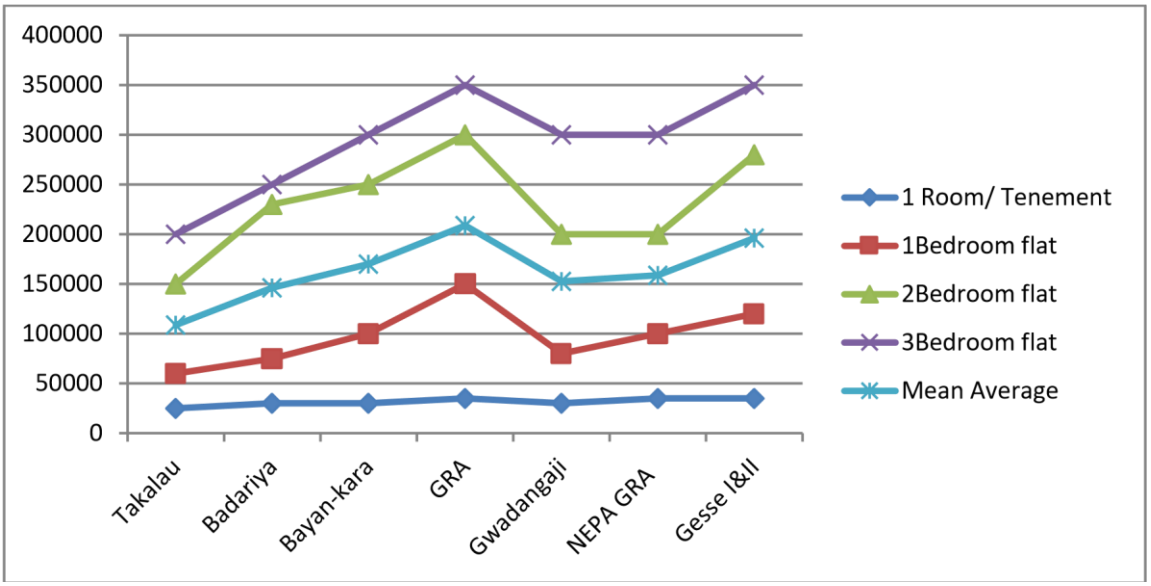


Fig.1. Mean of average rental values of residential properties in different locations.

The mean of the average rental value of residential properties varied from one location to another in the study area. It was N208,750 at G.R.A., this was followed by N196,250 at Gesse I&II and N170000 at Bayan-kara while at Takalau the mean average rental value was N108750 and at Badariya N146250.

5.4 Impact of Environmental quality on rental value

The summary of both the environmental qualities (AWMs) and the mean rental values were extracted and presented in table 5 below. This is to facilitate their being used for further analysis.

Table 5: Summary of Environmental Qualities (AWMs) and Mean Rental Values

Location	Environmental Quality (AWM)	Mean Rental Value (₦)
Takalau	2.71	108,750
Badariya	2.88	146,250
Bayan-kara	2.47	170,000
GRA	2.93	208,750
Gwadangaji	1.71	152,500

NEPA GRA	1.85	158,750
Gesse I&II	3.33	196,250

Source: Field survey 2023

The above table revealed that GesseI&II has mean environmental score of 3.33 and mean rental value of N196,750 compare to GRA that has less score (2.93) but higher mean rental value of N208750. The same goes for Gwadangaji with a score of 1.71 compare to Takalau that has 2.71 as environmental score but mean rental value of N52,500 and N108,750 respectively.

Table 5 was further subjected to correlation analysis using SPSS software and the result is as presented in Table 6.

Table 6: Pearson Correlations

		EQUA	MRENT
ENVQUA	Pearson Correlation	1	
	Sig. (2-tailed)		
MERVAL	Pearson Correlation	.344	1
	Sig. (2-tailed)	.450	

Analysis of surveyed data (2024)

Correlation is significant at the 0.05 level (2-tailed). Decision rules: r >0 is positive correlation r = 0 – 0.3 is weak correlation r = 0.4 – 0.7 is moderate correlation r> 0.7 is very strong correlation $p \geq 0.05$ fail to reject null hypothesis (it is not statistically significant)

The result of the analysis in table 6 above revealed that the correlation coefficient (r) obtained is 0.344 indicating positive but weak relationship between the two variables (environmental score and rental value). However, the significant level (p) of 0.450 is greater than 0.05 (i.e. 95% confidence level). This signified that correlation between the two variable (environmental score and rental value) is insignificant. Therefore, the null hypothesis cannot be rejected, that is, there is no significant effect of environmental factors on rental value of property in the study area. This is in contradiction to the established fact by numerous researchers that environmental quality play's crucial role in the determination of rental value of residential property.

6.0 CONCLUSION AND RECOMMENDATION

Contrary to the general believe, that environmental quality is crucial in the determination of rental value of residential property, and that the higher the environmental quality, the higher the rental value of residential property, this study concluded that environmental quality does not affect residential property rental value. This could be due to the increasing gap between the supply and demand of residential accommodation as the population in the study area always increases due to the influx of people from rural areas into the town. Tenants care less about environmental quality when there is a shortage of accommodation, more especially, in an upcoming city where, population influx is high like in the study area. However, the slight variation in the rental values observed in various locations could be as a result of other salient factors. Therefore, the finding in this study is suggestive, and point to the need for greater research into how environmental quality in combination with common characteristics of the residential property market might help explain variation in rental value of residential property within a particular area.

REFERENCES

Agabi, J., & Odekunle J. F. (2014). Housing quality of residential neighbourhoods in Nigeria: Focus on low density areas of Birnin-Kebbi, Kebbi State. *Covenant Journal of Research in the Built Environment (CJRBE).* (2) 2 148 – 164

Ambali, A. R. (2011) Policy of Sustainable Environment: Malaysian Experience. European *Journal of Scientific Research*, 48 (3): 466-492

Hanson A and Hawley Z. (2011). Do Landlords Discriminate in the Rental Housing Market? Evident from an Internet Field Experiment in U.S Cities. *Journal of Urban Economics*. 70 (2-3) 99-114.

Ardeshiri, A., Ardeshiri, M., Radfar, M., & Hamidian S. O. (2016). The values and benefits of environmental elements on housing rents. *Habitat International*, 55, 67-78. https://doi.org/10.1016/j.habitatint.2016.02.004

Asmma'Che K., Megat M. G., Megat A &Maryanti M. R.(2015). Impacts of Indoor Environmental Quality (IEQ) Elements on Residential Property Market: A Review. *Journal Teknologi* 73 (5) 99–106 | www.jurnalteknologi.utm.my | eISSN 2180–3722

Ayeni O. F., Kemiki O. A., Popoola N. I. & 2Musa H. D. (2022) Assessment of theContributionofEnvironmental Attributes to Residential Property Rental Value in Abuja. *ETSJ* 13(2), 11- 27. https://dx.doi.org/10.4314/etsj.v13i2.2

Bonaiuto, M. (2004). Residential satisfaction and perceived urban quality. In C. D. Spielberger (Ed.), Encyclopedia of applied psychology (pp. 267–272). doi:10.1016/B0-126574103/00698-X

Jiboye, A. D., (2010).Evaluating the pattern of residential quality in Nigeria: The case of Osogbo Township. *Architecture and Civil Engineering.* (8) 3. 307 – 316

Julius, K. (2002). Property-Value Impacts of an Environmental Disamenity: The Case of Landfills. *Journal of Real Estate Finance and Economics*, 22(2/3), 185-202

Kamp, I. V, Leidelmeijer, K., Marsman, G. and Hollander, A. (2003). Urban Environmental Quality and Human Well-being Towards a Conceptual Framework and Demarcation of Concepts; A Literature Study, *Landscape and Urban Planning* 65: 5–18

Kellekci, O. L., &Berkoz, L. (2006). Mass Housing: User Satisfaction in Housing and its Environment in Istanbul, Turkey. *European Journal of Housing Policy*, 6(1), 77-99

Maantay, K. (2001). "Measuring the Quality of Housing: An Econometric Analysis of Tax Appraisal Records". *Land Econ*., 53: 293-309

Madushani, K. H. A., Peiris, M.T.O.V., & Jayasinhe, W. S. (2019). A Study on Environmental Factors' Influence Towards the Potential Buyers' Decision on Luxury Apartments in the City of Colombo and Suburbs, *Sri Lanka Journal of Real Estate*, 14

Mba H.C. (1996) Towards more Environment Conscious Development Policies in 21stCentury Nigeria. *Proceedings of the 27thAnnual Conference of the Nigeria Institute of Town Planners,* Benin.

Paez, U. (2009). Impact of Neighbourhood Characteristics on House Prices. *ASBBS Annual Conference*: Las Vegas

Vincenza C, Leonardo C, Mario M & Michele O.(2014) A Neural Network based model for real estate price estimation considering environmental quality of property location. 17th Meeting of the EURO Working Group on Transportation, EWGT2014, 2-4 July, Sevilla, Spain. .*Science Direct* 810 – 817

Wokekoro E. (2020) An assessment of the effect of noise pollution on rental values of properties in Nigeria. *MOJ Eco Environ Sci*. 5 (5) 206–209. DOI: 10.15406/mojes.2020.05.00195

World Population Review (2025). Birnin Kebbi. https:worldpopulationreview.com

Yusof, M.A.& Ismail, S. (2012). Multiple Regression in Analysing House Price Variation. *IBIMA Journal*, 1(1), 101-118

APPENDIX

Establishing Mean Average Rental Value Table 4. Average Rental value Location 1

Room/ 1Bedroom	**2Bedroom**	**3Bedroom**	**Mean**	
	Tenement	**flat**	**flat**	**flat**	**Average**
Takalau	25000	60000	150000	200000	108750
Badariya	30000	75000	230000	250000	146250
Bayan-kara	30000	100000	250000	300000	170000
GRA	35000	150000	300000	350000	208750
Gwadangaji	30000	80000	200000	300000	152500
NEPA GRA	35000	100000	200000	300000	158750
Gesse I&II	35000	120000	280000	350000	196250

Source: Field survey 2023

Establishing Environmental Average Weighted Mean scores Table 3a. Takalau:

	5	4	3	2	1	WM
Environmental quality						
Safety/ Security	23 (115)	25 (100)	20 (60)	10 (20)	2 (2)	3.71
Drainage	8 (40)	12 (48)	24 (72)	25 (50)	11 (11)	2.76
Waste disp. System	10 (50)	13 (52)	12 (36)	32 (64)	13 (13)	2.69
Road	11 (55)	20 (80)	30 (90)	11 (22)	8 (8)	3.18
Power supply freq.	10 (50)	17 (68)	30 (90)	20 (40)	3 (3)	3.13
Water supply	15 (75)	27 (108)	18 (54)	9 (18)	11 (11)	3.36
Neighborhood cleanliness	6 (30)	20 (80)	14 (42)	28 (56)	12 (12)	2.75
Pollution	7 (35)	13 (52)	21 (63)	28 (56)	11 (11)	2.81
Environmental Quality (Average weighted mean (AWM))						**2.71**

Safety/ Security	0	10 (40)	31 (63)	30 (60)		2.23
Drainage	0	21 (84)	19 (57)	30 (60)	13 (13)	2.68
Waste disp. System	5 (25)	3 (12)	30 (90)	22 (44)	23 (23)	2.43
Road	2 (10)	6 (24)	32 (96)	30 (60)	13 (13)	2.54
Power supply freq.	0	4 (16)	13 (39)	36 (72)	30 (30)	1.96
Water supply	14 (70)	15 (60)	28 (84)	6 (18)	20 (20)	3.15
Neighborhood cleanliness	2 (10)	16 (64)	25 (75)	30 (60)	10 (10)	2.74
Pollution	0	3 (12)	16 (48)	32 (64)	42 (42)	2.06
Environmental Quality (Average weighted mean (AWM))						**2.47**

Source: field survey 2023

Table 3d. GRA: Analysis of environmental quality

	5	4	3	2	1	WM
Safety/ Security	9 (45)	15 (60)	35 (105)	10(20)	8 (8)	2.98
Drainage	6 (30)	15 (60)	19 (57)	26 (52)	11 (11)	2.63
Waste disp. System	5 (25)	3(12)	17 (51)	22 (44)	30 (30)	2.03
Road	27 (135)	30 (120)	20 (60)	0	0	3.96
Power supply freq.	10(50)	17 (68)	20 (60)	20(40)	10(10)	2.85
Water supply	6(30)	25 (100)	11 (33)	5 (20)	30(30)	2.66
Neighborhood cleanliness	3 (15)	30 (120)	28 (84)	9 (18)	7 (7)	3.05
Pollution	12(60)	24(96)	30(90)	7(14)	4(4)	3.30
Environmental Quality (Average weighted mean (AWM))						**2.93**

Source: field survey 2023

Table 3e. Gwadangaji: Analysis of environmental quality

	5	4	3	2	1	WM

Source: field survey 2023

Table 3b. Badariya: Environmental quality

		4	3	2	1	
Safety/ Security	0	6 (24)	19 (57)	32 (64)	30 (30)	2.18
Drainage	6 (30)	21 (84)	19 (57)	30 (60)	11 (11)	3.03
Waste disp. System	5 (25)	3(12)	17 (51)	32 (64)	30(30)	2.28

5

Source: field survey 2023

Table 3c. Bayan Kara:Analysis of environmental quality

	5	4	3	2	1	WM
					15 (15)	
						WM
Road	10 (50)	15 (60)	30 (90)	10 (20)	22 (22)	3.03
Power supply freq.	8 (40)	13 (52)	37 (111)	20 (40)	9(9)	3.11
Water supply	19 (95)	7 (28)	21 (63)	13 (26)	27 (27)	2.99
Neighborhood cleanliness	8 (40)	12 (48)	34 (102)	22 (44)	11 (11)	3.06
Pollution	12 (60)	15 (60)	40 (120)	8 (16)	12(12)	3.35
Environmental Quality (Average weighted mean (AWM))						**2.71**

Safety/ Security	3 (15)	10(40)	20(60)	27(54)	13(13)	2.26
Drainage	0	7(28)	15 (45)	20(40)	31(31)	1.80
Waste disp. System	0	0	11(33)	32 (64)	30 (30)	1.59
Road	2(10)	6(24)	15(45)	30(60)	20(20)	1.98
Power supply freq.	2(10)	4(16)	17(51)	32(64)	18(18)	1.98

Water supply	19 (95)	7 (28)	12(36)	15(30)	20(20)	2.61
Neighborhood cleanliness	0	6 (24)	14(42)	33(66)	20(20)	1.90
Pollution	0	0	12(36)	45(90)	16(16)	1.78
Environmental Quality (Average weighted mean (AWM))						**1.71**

Source: field survey 2023

Table 3f. NEPA GRA: Analysis of environmental quality

	5	4	3	2	1	WM
Safety/ Security	0	7 (28)	28 (84)	31 (62)	7 (7)	2.26
Drainage	0	9 (36)	8 (24)	6 (12)	50 (50)	1.53
Waste disp. System	5 (25)	0	11 (33)	27 (54)	30 (30)	1.78
Road	1 (5)	0	6 (18)	26 (52)	30 (30)	1.31
Power supply freq.	0	6 (24)	9 (27)	45 (90)	13 (13)	1.93
Water supply	22 (110)	8 (32)	6 (18)	17 (34)	20 (20)	2.68
Neighborhood cleanliness	0	0	12 (36)	47 (94)	14 (14)	1.80
Pollution	0	0	9 (27)	30 (60)	34 (34)	1.51
Environmental Quality (Average weighted mean (AWM))						**1.85**

Source: field survey 2023

Table 3g. Gesse I & II : Analysis of enviro nmental quality

	5	4	3	2	1	
Safety/ Security	12 (60)	32 (128)	24 (72)	12 (24)		14 (14)
	3.73					
Drainage	0 (0)	21 (84)	19 (57)		38 (76)	15 (15)
	2.90					
Waste disp. System	5 (25)		3 (12)	17 (51)		32 (64)
	37 (37)	2.36				
						WM
Road	7 (35)	23 (152)	30 (90)	22 (44)	15 (15)	4.20
Power supply freq.	18 (90)	22 (88)	26 (78)	21 (42)	7 (7)	3.81
Water supply	2 (10)	26 (104)	38 (114)	18 (36)	10 (10)	3.43
Neighborhood cleanliness	7 (35)	15 (60)	31 (93)	27 (54)	14 (14)	3.20
Pollution	5 (25)	9 (36)	28 (84)	42 (84)	10 (10)	2.99
(Average weighted mean (AWM))						**3.33**

Source: field survey 2023