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Effects of Abandoned Open – Mine Pits On Property Values In Dorowa, Nigeria

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Abstract: Mining activities apart from adding to the revenue base of individuals, families and the government has negative effect on the land cover and residents that adjoins the area, particularly, where such activities are done without recourse to sustainability. It is in this light that this study examined the effect of abandoned open - mine pits on residents' health, environment and rental value of property in Dorowa a suburb of Bukuru in Nigeria. Information relating to the effects of mine pits was obtained through the administration of 200 well structured questionnaires to residents of the area out of which 157 were returned and used for analysis with frequency count, mean score estimation, regression model and paired sample T test. It was discovered that abandoned open - mine sites in the neighbourhoods are breeding ground for diseases, death traps to young children, building collapse and degradable environment among others. Surprisingly, despite these notable challenges, there has been a sustained influx of people to the area from Jos North and its environs as a result of reoccurring religious violence making land and property values to be on the increase. It is therefore worthy of note from findings, that detrimental conditions may be neglected if there are some compelling push effects from other neighbourhood(s). This study therefore recommends that residents should be educated on the danger of building houses close to open - mine sites and the Federal and Plateau state government should as a matter of urgency rescue the security situation to curtail avoidable influx of people to the area. Also in the interim, the area should be fumigated to dislodge vector breeding insects and animals.

1. Introduction

Human activities on land vary. Human being exploits land for the purpose of building a house; cultivation of crops; building of roads; grazing of livestock; extraction of solid and non-solid minerals (Uchegbu, 1998; Adebayo, 2007; Ogunnowo and Oderinde, 2007). These activities may have positive or negative impact on the environment, depending on the nature, type of usage and the manner of exploitation. Mining exploitation is one of such human activities on land that has impact on the residential environment. The scale of operations involved in exploration, mining and processing of a mineral determines the intensity and extent of environmental degradation. For instance, Aigbedion and Iyayi (2007) opined that large – scale mining of tin and associated minerals in the Jos, Plateau has resulted in a high degree of degradation of arable land, vegetation and landscape, as well as other environmental problems. Though, these activities are usually not carried out within or around the built – up residential environment but as development/urbanisation sets in with passage of time, the areas which hitherto were used for agricultural purposes, mining exploitation and quarrying are gradually enveloped into residential/commercial built –up areas.

Interestingly, mining activities in the developed countries have since undergone phenomenal and rational changes within the purview of sustainable development (Lambert, 2001; Moran, 2003). In Nigeria, the efforts being made by government to ensure sustainable development was through the establishment of Environmental Planning and Protection Division (EPPD) in 1975 under the Ministry of Industry. Later, the Federal Environmental Protection Agency (FEPA) was established under CAP 131, LFN, 1990 as amended by Decree No 59 of 1992. The states also established their own Environmental Protection Agency. Akindele (2003) succinctly put forth the goals of this body, as to ensure a quality environment for the health and well being of the people, to conserve and use land with its natural resources for the benefits of present and future generations; restore, maintain and enhance the ecosystems and ecological processes essential for the functioning of the biosphere, to preserve biological diversity and principle of optimum sustainable yield in the use of living natural resources and ecosystem among others.

Despite these laudable programmes/efforts by the Nigeria government, there exist very many abandoned open – mine pits in and around residential environment. These previous mining sites have properties built very close to them, especially in Dorowa, a suburb of Bukuru in Jos South local

government area where properties are poorly set out around the precinct of these pits. The studies of Brooks (1974) and Aigbedion et al (2007) views the effect of mining of tin and columbite to include destruction to scenic landscape which may affect the limited land mass that may be used for development in cases were reclamation is not done. Moran (2003) said in the past, operating companies were not required to remediate environmental impacts to natural resources which had led to accumulated devastation of the environment due to mining activities. The environment that are devastated and abandoned may be stigmatized by occupiers of properties, particularly, if they are aware of the negative consequences of such activities. A recent study by Bello (2009) confirmed that stigma is attached by residents to environments that are characterised by these negative externalities, which in most cases is reflected in the amount residents are willing to pay as rent for properties.

It is based on the above that this study is set to assess the effect of abandoned open – mine pits on residents' and rental value of properties in Dorowa, Jos South local government, Nigeria. In doing this the following questions should readily come to mind: What are the effects of abandoned mine pits on residents' of Dorowa, Jos? What is the influence of open – mine pits on the value of property in Dorowa, Jos? To ascertain the veracity of differences in rental value of Dorowa and other areas, the following null hypothesis is worth testing in this study: there is no significant difference between rent paid for properties in Dorowa, Bukuru, Jos south and Nasarawa Gwom, Jos north. The results should aside from adding to the body of knowledge, help policy makers in dealing with the menace of detrimental conditions in and around residential property environment.

2. Literature Review

Aigbedion et al (2007) gave an insight into what constituted the environment as having three components: the sum total of external conditions in which organisms exist; the organisms themselves including the floral and faunal community; and the physical surroundings such as landforms, trees, and real properties among others. Mining activities have over the years impacted positively and or negatively on the environment. Rolfe (2004) while carrying out a study on the economic impacts of coal mining on small country town of Nebo using the input – output models and multiplier approaches found that mining industry is a major contributor of revenue to the Queensland economy. Muyanda and Gu (2008) in a study using the simple percentages to investigate the magnitude of small scale quarrying and mining on the environment in Crooks/Nyerere compound of Lusaka found that mining can provide job and increase income of miners per day. The same view hold sway in Ajakaiye (1985); Adekoya (2003); Ogunnowo et. al. (2007) and Aigbedion et al (2007) on environmental effect of mineral exploitation in Nigeria, where it was discovered that mining of solid and non – solid minerals contributed to the national wealth with socio – economic benefits to residents' of that area.

The desire of miners either illegal or legal is to improve their financial base; hence, the study byRolfe (2004) presents an idle situation of mining exploitation done within the ambit of the law where mining industries are expected by law to pay royalties to the government which serves as source of revenue to the government. Illegal mining breeds a situation where the income realised remain with the miners and their collaborating companies with little or nothing for the government. The study of Muyanda et al (2008) found that illegal mining thrives in Lusaka in which case, the problem of environmental landscape and land degradation ensued. Aigbedion et al (2007) found that mining exploitation contributed to the pollution of air, land and water. It also cause damages to the vegetation, ecological disturbance, degradation of natural landscape, geological hazards, socio-economic problems and radiation hazards arising from by – products of tin etc. More so, it is more terrible if an area used for mining previously is left un-reclaimed. The consequence is more on residents as Muyanda et al (2008) found the presence of craters and open pits left after quarrying and mining as great danger to miners and residents of the area.

Abandoned open - mine pits may have a spill over effect on the amount paid for residential property in areas where mining has taken place. This is because of the negative consequences of its operation on the environment. Williams (2011) in a study on the impact of surface coal mining on residential property values using the hedonic price model, found a decrease in rental value of properties in the three model specifications that were explored. Specifically, the estimate show that the addition of a surface mine to the average County decreases aggregate property values by between .34% and 1.7%. Another study that found a negative influence of mining on property prices was that of Prasad, Clevo and Wasantha

(2012) on the impact of mining and smelting related pollution. The results of the study show that the marginal willingness to pay to be farther from the pollution source is AUS $13 947 per kilometre within the 4 km radius selected. Mining is an environmental externality that serves as amenity if it is done with sustainability in mind and dis-amenity if done without sustainability in focus. Therefore, studies on negative externalities can also suffice in exposing how this could affect value of property. Wisinger (2006) showed that hazardous waste disposal sites do have a negative impact on nearby property prices. The analysis took into account the distance from the waste disposal site to a particular property. The same view was found in Bello (2009) who assessed residents' perception of a waste dump site and found that the amount of rent paid decline as occupants live closer to waste dump site. The decline in the amount paid is the result of stigma on the environment. Environmental stigma has received considerable attention by appraisers/valuers in this decade (Jackson 2004; Chan 2004; Gamby and Reid 2005). Chan (2004) specifically affirmed that stigma is a negative effect on the value of property arising from contamination and health risk. Surprisingly, the study of Gamby and Reid (2005) on environmental stigma or property value enhancement of gold mining in Paeroa and Te Aroha in New Zealand concluded that there has been a positive value enhancement on vacant land and housing. From these, it can safely be said that if an environment is stigmatized by residents, it could have a short and long time effects, however, this may be dependent on what people are looking for in areas/neighbourhoods where vacant land and or property are situated. This current study contributes to literatures by highlighting the Nigerian situation of value enhancement "valenhance" as used by Gamby and Reid or environmental stigma arising from detrimental conditions in Dorowa.

3. Material and Methods

Jos is in the middle – belt region of Nigeria and capital of Plateau State. It is located on lat. 9º 52 N and long. 8º 54 E. Jos is about 1250m above sea level on the Delimi River. The average monthly temperature range between 21 and 250 C. the monthly rainfall ranges from 200 – 325mm between May and September and 2.5 – 85mm for the months of January through April and October through December (Chukwu, 2005). Jos is noted for mining activities which started as far back as 1902 with tin and columbite as the major targets (Federal Department of Museum and Monuments, 1979). Jos has North, South and East as its local government areas. Jos South houses the Governor's office in Rayfield and can thus be described as the defacto capital of plateau state. Its headquarters are in the town of Bukuru at 9°48′00″N 8°52′00″E. It has an area of 510 km² and a population of 306,716 at the 2006 census. Dorowa is a suburb of Jos south local government area which is located few kilometres from Bukuru, the local government headquarters. Dorowa is also notable for its high rate of mining activities in the past which have left the area devastated with so many mine pits.

The data for this study was collected through a well structured questionnaire randomly distributed on 200 household heads of residential properties in Dorowa, Jos South local government area of Plateau State out of which 157 were returned. Questions relating to effect of abandoned mine pits on residents and their residential environment such as damage to land cover, breeding ground for mosquitoes, nauseating stench on the environment, contaminated environment and rent paid were among other things asked. Further to this, in order to compare the rental value of Dorowa, an area infested with abandoned mine pits with the rental value of Bukuru, the headquarters of Jos South local government area, an area without mine pits. Another comparison of rental value of Dorowa was made with rental value per annum of properties in Nasarawa Gwom in Jos North local government area. Local property agents and residents were asked through oral survey the rent paid per annum for properties in Bukuru and Nasarawa Gwom respectively. This was done to know if there is any variation in the rent paid in these areas that are without mine pits with the study area.

Analysis was done in stages: first, the socio economic characteristics of respondents were analyzed using the simple percentages; this is followed by weighted mean score to analyze the effects of abandoned mine pits on residents and residential environment in the study area. In this study, weighted mean score as used by Ojo (2005) and Babawale (2005) and adopted by Yacim et al (2012) was calculated as follows:

$$Mean\ Score = \frac{5n_5 + 5n_4 + 3n_3 + 2n_2 + 1n_1}{n_5 + n_4 + n_3 + n_2 + n_1} \quad (1)$$

$where\ n_5 = number\ of\ respondents\ who\ answered$ "strongly agree"
$n_4 = number\ of\ respondents\ who\ answered$ "agree"
$n_3 = number\ of\ respondents\ who\ answered$ "$undecided$"
$n_2 = number\ of\ respondents\ who\ answered$ "disagree"
$n_1 = number\ of\ respondents\ who\ answered$ "strongly disagree"

Thirdly, regression model was used to assess the effect of abandoned open – mine pits on rental value of properties. The regression equation used in this study is given as:

$$REVL = b_0 + b_1PERD + b_2NOTB + b_3PRAG + b_4SZPL + b_5STRD + b_6PRMP + b_7NOHE + e \quad (2)$$

Where REVL is the rental value of properties paid per annum measured on the actual amount paid, PERD is period of residency scaled as the number of years spent in current property, NOTB is the number of toilet and bathroom in property measured as the actual number found in residence. PRAG is the age of property measured in years, SZPL is the plot size measured in square footage, STRD is the state of road within the neighbourhoods measured as "1" for good road and "0" for poor road network; PRMP is the presence of mine pits measured as "1" for presence of pit and "0" for absence of pits. The last variable is NOHE which is number of hours electricity is supplied per day measured as the actual number of hours and e is the error term.

Finally, the paired sample T test at 95% confidence level was used to compare the rental value of properties in Dorowa and Bukuru in Jos South local government area and Nasarawa Gwom in Jos North local government area of Plateau State, Nigeria.

4. Analysis and Discussion

This section deals with analysis and discussion of the data collected from the study area. The socio economic feature of respondents was summarized in the table below.

Table 1: SOCIO ECONOMIC CHARACTERISTICS OF RESIDENTS IN THE STUDY AREA

S/NO	SOCIO ECONOMIC CHARACTERISTICS		NO OF RESIDENTS	% OF RESIDENTS
1	Occupation of Residents:			
	i.	Farming	24	15
	ii.	Mining	05	03
	iii.	Civil servants	32	20
	iv.	Petty trading	63	40
	v.	Private employment	20	13
	vi.	Others, please specify.....	13	09
2	Period of Residency:			
	i.	1 – 5 years	48	31
	ii.	5 – 10 years	47	30
	iii.	10 – 15 years	37	24
	iv.	15 – 20 years	10	06
	v.	> 20 years	15	09
3	Place of former Residency:			
	i.	Jos North	49	31
	ii.	Barikin Ladi	14	09
	iii.	Bassa	19	12
	iv.	Riyom	12	08
	v.	Bukuru	39	25
	vi.	Others, please specify.....	24	15
4	Reasons for relocation to current place of residency			
	i.	Religious Violence in those Places	65	42
	ii.	Employment Reasons	44	28

	iii.	Marriage	01	01
	iv.	Availability of services	02	01
	v.	Schooling	21	13
	vi.	Move to my new House/Property	24	15
	vii.	Others, please specify	-	-
5	Marital status			
	i.	Married	88	56
	ii.	Single	57	36
	iii.	Divorced	04	02
	iv.	Widowed	08	05
6	Ownership Status			
	i.	Landlord	64	41
	ii.	Tenant	93	59
	iii.	Others, please specify	-	-
7	Educational level			
	i.	No formal education	-	
	ii.	FSLC	19	12
	iii.	GCE/SSCE	26	17
	iv.	ND/NCE	58	37
	v.	BSc/HND	48	31
	vi.	M.Tech/PhD	06	04

Table 1 shows the analysis of respondents' socio-economic characteristics in the study area. The first is respondents occupation, the dominant sampled population show that 40% are into petty trading, some of them have shops at Dorowa market others are trading within the residential neighbourhoods. Civil servants represent 20% of the sampled population in the study area. Though, some of them may be working in other areas like Bukuru, Zawan etc., they migrate between their place of dwelling and work. Others are into private occupation and farming representing 20% and 24% of the sampled population. In recent years, people were encouraged to be enterprising in private employment of which farming is part of what the people were advised to undertake. There are pockets of students from school of Health Technology, located in the study area who are not residing in the school hostels among the respondents. This represents 13% of the people interviewed. Mining activities which was the dominant occupation of residents in the past seems not be booming as only 3% of the respondents are engage in mining. The subject matter of this study is on the mine pits which were abandoned over many years by the players. Currently mining activity is not going on in the study area, this probably, informed the low percentage of respondents in that occupation.

The length of stay of residents shows in the table that there is a high concentration of new entrant into the area in the last one and half decades. This represents 85% of the respondents, an indication that there is a steady rise in the population of the area. In real estate economics and valuation, one of the factors that influence the value of property is increase in population. Consequently, with this increase, there may be a commensurate increase in values of land and property in Dorowa.

Place of former residency of respondents' show that they were from areas not too far away from the study area. The analysis shows that 31% and 25% of respondents are from Jos North and Bukuru, the headquarters of Jos South, 8%, 9% and 12% are from Riyom, Barikin Ladi and Bassa. Others are from areas not listed including Mangu, Pankshin and other states of the federation. Jos north and Bukuru, Jos South local government areas are located few kilometres from Dorowa. Jos South is the local government that housed Dorowa. In terms of better housing and infrastructure, they surpassed Dorowa, however, reasons for relocation to the study area in the analysis shows 42% of respondents saying they relocated to Dorowa because of frequent religious violence. Jos North and Buruku in Jos South are notable for incessant crisis that render the cities to be polarised along religious lines. Residents segregated in relation to their religion (Christians moving to area dominated by Christians while Muslims move to areas that are dominated by Muslims) making many housing accommodations to be vacant in

those areas where residents felt insecure (Aliyu, Kasim and Martins, 2012). Another reason given for relocation is employment reasons. The presence of tertiary institution in the area serves as magnet for pulling people into the neighbourhood to work. Students of the tertiary institution and those who relocated because they built their own houses represent 13% and 15% of the sampled population.

On the marital status of respondents, the married dominated the people interviewed with 56% and singles with 36%. The married were more in number and should be able to give concise information on the effect of abandoned mine pits on members of their families, particularly, on the safety of their children. In this study, tenants were 59% and landlords were 41%. For the purpose of analysis on rental value of property and mine pits, these tenants were in good position to supply information on rent paid. Respondents' educational background shows that 100% of them have had at least primary education. The high rate of literacy among the inhabitants of Dorowa may be connected with the desire and efforts of the Nigerian government for all its citizens to be literate. This has made most communities to have literacy classes for adults who do not have the opportunity of going to school to know how to read and write.

4.2 EFFECTS OF OPEN MINE PITS ON RESIDENTS AND RESIDENTIAL ENVIRONMENT

Abandoned mine pits have influence on residents themselves and the environment where they live. Table 2 shows the analysis of the effect of these pits on residents and residential environment.

TABLE 2: EFFECTS OF MINE PITS ON RESIDENTS AND RESIDENTIAL ENVIRONMENT

S/NO	EFFECTS OF MINING PITS	5	4	3	2	1	MEAN SCORE	RANKING
i	Breeding ground for mosquitoes	97 (62)	46 (29)	10 (06)	03 (02)	01 (01)	4.48	1
ii	Nauseating stench on the environment	50 (32)	72 (45)	22 (14)	12 (08)	01 (01)	4.01	2
iii	Contaminated environment	46 (29)	77 (49)	12 (08)	18 (11)	04 (03)	3.91	4
iv	Degradable land cover	39 (25)	60 (38)	31 (19)	23 (15)	04 (03)	3.68	6
v	Prevalence of sicknesses and diseases	44 (28)	44 (28)	19 (12)	26 (17)	24 (15)	3.65	7
vi	Risk of building collapse	45 (29)	72 (46)	16 (10)	15 (09)	09 (06)	3.82	5
vii	Death of little children in the mine pits	72 (46)	51 (32)	06 (04)	11 (07)	17 (11)	3.96	3

Table 2 contains the mean score rating of the effect of abandoned mine sites on residents and environment. In the analysis, mine pits are breeding ground for mosquitoes rank first with a mean score of 4.48. The water in the sites do not flow as the place is just around the precinct of residential properties with no water flowing into or out of it, mosquitoes are breeding in the area and the resultant consequences of this may be a high rate of malaria fever in the area. Malaria fever is a major challenge in Nigeria and African continent in general. The water that does not have channel flowing in and out has a negative effect of awful smell in the neighbourhood. This is evident from the analysis that ranked second with a mean score of 4.01. Quite naturally stagnant water is a problem in any neighbourhood. This is because apart from breeding ground for mosquitoes it stinks also. The next in this analysis, is that abandoned mine pits are death traps for small children who play around it. Thus, mine pits have become part of the externalities in this neighbourhood, hence, children in the course of play, hover around these sites and ones they fall into it without the knowledge of adults they may lose their lives before it is known. This has a mean score of 3.96. Contaminated residential environment is fourth with a mean score rate of 3.91. These open – mine pits are detrimental to the wellbeing of residents in the study area because of the negative effect of other unwanted minerals that are extracted with tin, columbite and other useful minerals. The study of Ngyang (2007) and Gyang and Ashano (2010) found that these minerals have terrible health implication and could cause death of people. Mine pits could cause the collapse of building which ranked fifth with a mean score of 3.82. This rating is quite high, an indication that the degree of resident agreement with the variable is not in doubt. The plate below show the distance between properties and an abandoned open – mine pits which has over the years been widened due to neglect. The more it widened, the nearer it is to the residential properties until it swallow it up as others did to properties that surround them in the past. The next are mine pits effect on land cover and prevalence of sicknesses and diseases which are sixth and seventh with mean scores of 3.68 and 3.65 respectively. Mining activities in most developing countries is not done with sustainability in view; this has left environment in a terrible devastated condition after the activity (see Kitula, 2005). This

is the case with Dorowa as the plate has shown and there are several of such open – pits in the study area.

Plate 1: Abandoned Open – Mine Pits Near Residential Environment in Dorowa

4.3 EFFECTS OF ABANDONED MINE PITS ON RENTAL VALUE IN DOROWA

The influence of abandoned mine pits on rental value was analysed in this section using the regression model. Table 3 provides the analysis of variance for the result.

TABLE 3: ANALYSIS OF VARIANCE OF EFFECT OF MINE PITS ON RENTAL VALUE

Model	Sum of Squares	Df	Mean Square	F	Sig
Regression	7.589E10	7	1.084E10	9.314	.000
Residual	9.312E10	80	1.164E9		
Total	1.690E11	87			

In carrying out this analysis, only 88 of the 93 questionnaires returned by tenants were used. This is because the remaining 5 were not properly filled for inclusion in the regression model and their removal did not affect the validity of the result.

TABLE 4: REGRESSION COEFFICIENTS OF THE EFFECT OF ABANDONED MINE PIT ON RENTAL VALUE

	Unstandardized Coefficients		Standardized Coefficients		
Model	B	Std error	Beta	T	Sig
Constant	-65224.798	23527.144		-2.772	.007
PERD	-1132.570	1215.914	-.088	-.931	.354
NOTB	27946.383	5512.415	.476	5.070	.000
PRAG	-26.437	1177.082	-.002	-.022	.982
SZPL	3.701	1.539	.228	2.405	.018
STRD	-4225.648	7690.995	-.046	-.549	.584
PRMP	4386.464	7781.299	.048	.564	.575
NOHE	3626.048	1513.391	.202	2.396	.019

R2 = 45 Adj R2 = 40

P – Value @ < 0.05 significant level.

In Table 4 above, three variables were found to be significant (NOTB – number of toilet and bath, SZPL – size of plot and NOHE – number of hour's electricity is supplied per day). This shows that these variables contribute to rental value of properties in Dorowa. Other variables (PERD – period of residency, PRAG – property age, STRD – state of road and PRMP – presence of mine pits) do not have any effect on the rental value of property in the study area. The variable of interest in this study is PRMP (presence of open – mine pits). This variable has a significant level of 0.58 which is more than the allowable 0.05 level at p value used in this analysis. It appears residents do not bother with the presence of mine sites in their search for housing accommodation in the study area, despite the R2 value of 45% attributable to the independent variables used in this analysis.

4.4 COMPARISON OF RENTAL VALUE OF DOROWA WITH BUKURU AND NASARAWA GWOM

In furtherance to knowing the effect of abandoned mine pits in the study area, a comparison was made with rental value of properties in Bukuru and Nasarawa Gwom in Jos South and North local government areas. Table 5 shows the average rent paid per annum for properties in Dorowa, Bukuru and Nasarawa Gwom respectively.

TABLE 5: AVERAGE RENT PAID FOR PROPERTIES IN DOROWA, BUKURU AND NASARAWA GWOM

S/NO	TYPES OF PROPERTY	AVERAGE RENT PAID PER ANNUM		
		DOROWA	BUKURU	NASARAWA GWOM
i.	Single Room	11,000	8,000	15,000
ii.	Room & Parlour	34,500	18,000	24,000
iii.	1 bedroom bungalow/flat	115,000	65,000	25,000
iv.	2 bedroom bungalow/flat	125,000	125,000	52,500
v.	3 bedroom bungalow/flat	275,000	225,000	140,500
vi.	4 bedroom bungalow/flat	400,000	375,000	200,000
vii.	5 bedroom bungalow/flat	450,000	420,000	250,000

The average rental value of properties paid per annum in Table 5 shows a result that agreed with the regression model used in this analysis. Dorowa, an area infested with abandoned mine pits has a higher rental value than Bukuru, the headquarters of Jos south and Nasarawa Gwom, a neighbourhood with very large land mass and better infrastructure in Jos north local government. The inference that could be deduced from this may be connected with the reasons given by residents for relocation to Dorowa. According to respondents, incessant religious violence in Jos north and Bukuru were among the reasons for relocation to Dorowa a suburb of Bukuru which is considered relatively peaceful despite the challenge of degradable land cover, risk of building collapse among other challenges that bedevilled the area.

In testing the null hypothesis for this study which states that there is no significant difference between the annual rent paid for properties in Dorowa, Bukuru and Nasarawa Gwom, the paired sample T test was used at 95% confidence level and the result is as shown in tables 6 and 7 below.

TABLE 6: PAIRED SAMPLE CORRELATIONS FOR RENTS IN DOROWA, BUKURU AND NASARAWA GWOM

Pairs	Areas	N	Correlation	Sig
Pair 1	Dorowa & Bukuru	7	.994	.000
Pair 2	Dorowa & Nasarawa Gwom	7	.985	.000

The analysis in Table 6 supports the claim of variations in rental value of properties in the selected areas in Table 5 above. Further analysis that shows the level of significant difference of rental values is done in table 7 below.

TABLE 7: PAIRED SAMPLE TEST FOR RENTS IN DOROWA, BUKURU AND NASARAWA GWOM

		Paired Differences							
					95% Confidence Interval of the Difference				
Pairs	Areas	Mean	Std Deviation	Std Error Mean	Lower	Upper	T	df	Sig (2 – tailed)
Pair 1	Dorowa & Bukuru	24928.57143	20232.87047	7647.30623	6216.28719	43640.85566	3.260	6	.017
Pair 2	Dorowa & Nasarawa Gwom	99857.14286	82241.87614	31084.50737	23796.09338	1.75918E5	3.212	6	.018

The results in Table 7 present the average rental value per annum of properties in the three areas under review. In this analysis Dorowa has a relatively higher rental value than Bukuru and Nasarawa Gwom. The level of significant difference at 95% confidence level on a 2 tailed test is below 0.05. With this result, the null hypothesis which states that there is no significant difference between the rent paid for properties in Dorowa and the other areas is hereby rejected. The distance between Bukuru and Dorowa is about 5 km. Surprisingly, despite the detrimental conditions that bedevilled the residential environment in Dorowa, people seems to be comfortable with living in the area because of the relative peace of the area. Nasarawa Gwom which is about 25 km from Dorowa used to be a densely populated area in Jos, North but because of the incessant religious violence that left scores of people death, residents relocated to other areas including Dorowa for safety leaving the area with very many properties that are in void and obsolescence state (Aliyu et al, 2012). In Table 7, the mean for rental value of properties in Dorowa and Bukuru is 24,929 while that of Dorowa and Nasarawa Gwom is 99,857. The mean difference of Dorowa and Bukuru is too high when compared with Dorowa and Nasarawa Gwom (99,857 – 24,929) which is 74,928. This shows that Nasarawa Gwom has lower rental value at the moment. The study of Aliyu et al (2012) highlighted the devastated influence of ethno – religious violence on rental value in Jos, North in which Nasarawa Gwom is a neighbourhood. This decrease was probably the consequence of relocation of residents to areas considered safe for habitation of which Dorowa is having a push effect of such relocations.

4.5 FINDINGS, RECOMMENDATIONS AND CONCLUSION

This study found that mine pits around the precinct of residential properties in Dorowa have added to degradable land cover, death trap to young children and building collapse occasioned by earth movement and widening of the pits. The study also found that residents seem to be relaxed with the detrimental effect of mine pits because of the relative peace in the area. The consequence is that with the increase in population, there has being a sustained increase in land, rental and capital values of properties in the study area.

Following the above discoveries, there is an urgent need for Federal and Plateau State governments to take steps to curtail the recurrent religious violence in the areas that push the population of Dorowa upward, considering the effects on the available facilities. Also, the area which is gradually becoming a slum with the rate of people's influx and uncontrolled development around mine pits should be fumigated; fence round with barb wire and residents should be given orientation on the danger of living in such areas irrespective of the relative peace enjoyed by them.

Environmental degradation is a consequence of man's activities on land, especially where this is done without recourse to sustainability. It portends great danger both in the interim and in the near future as the situation is in Dorowa, Jos. This could affect the wellbeing of residents, and properties but surprisingly, detrimental conditions was somewhat neglected in this current study as the rent for properties continued to increase because of the influx of more people to the study area in search of

peaceful environment. There is a need for future research to assess the relative satisfaction of occupiers of properties in Dorowa.

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