Understanding Vulnerability of Ilorin Central Area, Ilorin, Kwara State

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Abstract

Urban vulnerability to disasters is indubitably a function of human behaviour and lifestyles. Globally, countries have shown vulnerabilities to disasters, both natural and man-made in the time past and present. However, poverty represents a distinct contributing factor to vulnerabilities both in time and space. it is against this problem proceedings that this research was borne out with the aim of investigating the vulnerabilities vis-à-vis the resilient nature of Ilorin central area. The specific objectives of this study focus on assessing the socio-economic characteristics of the study area, identifying the actual and potential disasters of the study area. Etc. The methodology employed involved the collection of spatial (satellite imagery, topographical map. Etc.) and non-spatial data (socio-demographic data, risk factors etc.), both primary and secondary data. The key findings from multiple regression analysis using dummy variables reveals that there exists a functional dependency at a significant *p* level of 0.00 on Unregulated land use, socio-economic characteristics. Furthermore, flooding and traces of heat wave were labelled to be the most prevalent form of vulnerability in Ilorin central area of study. To this end, few policy responses like public awareness, adaptive urban planning techniques, community engagement were recommended as a way forward in coping and forestalling vulnerabilities.

Keyword: Vulnerability, Resilience, Urban Risk

Introduction

Issues of risk and vulnerability have been extensively and abundantly researched by many academic disciplines. Globally, countries have shown vulnerabilities to disasters, both natural and man-made in the time past and present. The multitude of people affected by dramatic natural shocks is evidence of our inadequacy at dealing with such events (Pelham, Clay, & Braunholz, 2011). Rasmussen (2004) report, contains information on 14,535 natural disasters since 1900, including estimates of the number of people affected and the value of damage. According to these data, since 1970 natural disasters have affected more than 5 billion people and have caused more than $1 trillion in damage. In the economic vein, between the 1950s and the 1990s, Benson and Clay (2004) report that the global cost of natural disasters increased 15-fold. The report further maintains that major natural catastrophes in the 1990s caused economic losses estimated at an average US$66 billion per year (in 2002 prices). In 1995, the year of the Kobe earthquake in Japan, record losses of about US$178 billion were recorded, the equivalent of 0.7 percent of global gross domestic product (Munich Re, 2002). The most familiar and publicized hazards are those that take place without warning, often of catastrophic dimensions.

The combined effects of sea-level rise, floods and storms have damaged the homes and livelihoods of millions of urban dwellers (Brown , 2015). Despite debate among the scientific community about the frequency and predictability of natural disasters and extreme weather events, there is consensus that the concentration of urban populations and economic activity in hazardous locations is increasing, with impacts being felt more by the urban poor. Rasmussen (2004) postulates that there are two fundamental reasons for development of hazards. First, an increased concentration of population in high-risk areas (Freeman, Keen, & Mani, 2003). Second, an increase in the frequency and intensity of extreme weather events. This second development is generally thought to be associated with the rise in mean global surface temperatures and is expected to become more pronounced during the twenty-first century (IPCC, 2001).

A flood or a typhoon does not distinguish between residents, affecting everyone in its path (UNEP, 2009). However, the UNEP (2009) report further maintains that urban vulnerabilities are created directly by global change such as sea level raise and flooding (more than 80% of cities are on river basins or close to a coast, or both). No gainsaying that vulnerability to natural disasters is found to have important policy implications. By definition, VUSSC (2006) defines it to be the extent to which a community's structure, services or environment is likely to be damaged or disrupted by the impact of a hazard. In other words, it can be labelled as the degree of possibility that loss will occur with negative consequences. With resilience taking the other extreme as regards how these shocks can be absorbed and quickly recover. However, the results show that developing countries tend to suffer most from natural disasters, especially in terms of the number of persons affected and the value of the damage (Benson & Clay, 2004). Many African countries including Nigeria have showed resistance to many natural disasters like earthquakes, tsunami, cyclones. Etc. but vehemently have no answer to issues of flooding, landslides, mudslides, drought, desertification, terrorism. Etc.

Urban areas are not disaster prone by nature; rather the socio-economic structural processes that accelerate rapid urbanisation, population movement and population concentrations substantially increase disaster vulnerability, particularly of low-income urban dwellers (UNEP, 2009). Empirically, poor areas are more prone to natural disasters than wealthy areas. Hence there is a link between disaster risk and poverty, one that Pelham, Clay and Braunholz (2011) posit can lead the poor to become trapped in a cycle of poverty and exposure to natural shocks. A factor used in characterizing hazards is their predictability (Natural Hazards, 2009; Corbett, 2009). An important concept of predictability is the *return period*, which represents the average period of time for an event of a given magnitude to recur. Public perception of the seriousness of a hazard is influenced by many factors, but in general a hazard is more acceptable if a relatively small amount of damage takes place frequently, compared with a large degree of damage occurring infrequently. Comparatively, with all these historical evidences, little is known about the extent to which fragile cities are able to cope, adapt and rebound from massive shocks (Muggah, 2012)**.**

Understanding vulnerabilities in the context of Ilorin metropolis have been perceived under natural and human caused events. Ilorin is a typical traditional African city whose urban history predates colonialism in Nigeria (Olorunfemi, 2011). This presupposes the fact that Ilorin is characterised by ever-increasing population, whose larger percentage are impoverished, and are on a daily basis exposed to risks of disaster (Bako, Aduloju, & Abubakar-Kamar, 2017). Conceptually, Raheem (2011) argues that the collective forms of hazards in Ilorin ranges from tropical storms, land erosion, windstorms, floods, drought, desertification and human diseases. According to the *National Bureau of Statistics report 2016;* the percentage of urban poor in

Ilorin stands at 61.8%. Poverty represents a distinct contributing factor to vulnerabilities both in time and space. This assertion has given rise to demands for precarious locations to rest their heads. From many literatures like World Bank (2015); World Bank (2016), it has been ascertained exhaustively that poverty, population growth, unregulated land use and urbanisation all represent an important indices in predicting the potential of a disaster and its return period in any locality (World Bank, 2015). However, it is against this problem proceedings that this study tends to investigate the vulnerabilities vis-à-vis the resilient nature of Ilorin central area.

Literature Review

Concepts and Definitions of Vulnerability

The tentacles of natural caused events cut across all aspects of human endeavours measured on the degree of tangibility and intangibility (Table 1). Tangible vulnerability can be defined has vulnerability that can be quantified. In other words, attaching numerical values to empirical properties according to specified units. While in tangible takes the other extreme as regards what and what that cannot be quantified. Vulnerabilities associated with disasters are not prerogative of economic factors alone, as it cut across physical, social, economic, cultural institutional, political and psychological factors. These factors in which Twigg (2004) believes shape people's lives and the environment that they live in. Concentration of population and infrastructure in cities contribute to increased exposure to natural hazards. Pelham, Clay, & Braunholz (2011) argue that vulnerability is the human dimension of disasters and is changing quickly, especially in countries that are experiencing economic transformation— rapid growth, urbanisation, and related technical and social change. Given this assertion, natural shocks can affect people differently, the premise is that a major hazard may not lead to disaster, if a community or vulnerable groups are well-prepared. The risk of a disaster is therefore defined by both the probability of the hazard and the vulnerability of the household and community.

Table1: Classification of Vulnerabilities

Types of Vulnerability Characteristics	Types of Vulnerability Characteristics
Tangible/Material (easy to see; value easily determined)	People – lives, health, security, living conditions Property – services, physical property loss, loss of use Economy – loss of products and production, income Environment – water, soil, air, vegetation, wildlife
Intangible/Abstract (difficult to see; value difficult to determine)	Social structures – family and community relationships Cultural practices – religious and agricultural Cohesion – disruption of normal life Motivation – will to recover; government response

Sources: Authors Computation, 2018

On average, natural disasters affect about 2 percent of a country's population each year and cause damage amounting to well over one-half of 1 percent of GDP and99 percent of the people affected were in developing countries (Rasmussen, 2004). Disaster risk is an intrinsic characteristic of human society, arising from the combination of natural and human factors and subject to exacerbation or reduction by human agency (Olorunfemi, 2011). While the adverse impacts of climate change on society may increase disaster risk, disasters themselves erode environmental and social resilience, and thus increase vulnerability to climate change (O'Brien, et al., 2008).*Ip so facto*, one can clearly adduce that resilience of community depends on the frequency reoccurrence of disaster.

Vulnerability is the potential to suffer harm or loss, expressed in terms of sensitivity and resilience or of the magnitude of the consequences of the potential event (ALNAP, 2002). Conceptually, sustainability and resilience both follow the conservative standard concerning resource use and the associated risks and disasters, along with anticipation of various dimensions of vulnerability (Perrings, 2006). Given this statement, this study however, submits that there exists a tripartite relationship between Hazard, risk and vulnerability, with all the three sitting on resilience – this Agbola & Falola (2017) believe is the magnitude of disturbance that can be absorbed before the ecosystem changes its structure by changing the variables and processes that control behaviour. In the same vein, (Walker, et al., 2006) aver resilience to be the capacity of a system (Environmental System) to experience shocks while still retaining essentially the same function, structure, feedbacks and identity.

The unified approach of hazard and vulnerability can be unified in the risk formula, R=f (H, V), where the risk of disaster (R) is measured by the risk of hazard (H) and vulnerability (V) (Pelham, Clay, & Braunholz, 2011). This acknowledges that a hazard can be an exogenous trigger for disaster, but vulnerability is an endogenous and therefore controllable factor of disaster (Pelham, Clay, & Braunholz, 2011). Instead, by differentiating events by frequency, as we have sought to do here, the risk of occurrence then becomes the basis for determining the need and type of response, which in this case, focuses on social protection. Categorizing hazards in terms of risk is seemingly tautological. As this is based of degrees of uncertainty. It is a difficult exercise but can be useful for deciding the appropriate response to invest in, to cope with a potential natural hazard. In reality, a country's financial capacity as well as political support will determine the options.

Vulnerability does not occur fortuitously. Urban vulnerability to disasters is indubitably a function of human behaviour/lifestyles. Urban areas provide a number of socio-economic opportunities for jobs and income generation, but are also simultaneously becoming increasingly risky places to live, especially for low-income residents of cities in developing countries (UNEP, 2009). Exposure to environmental risk and hazard is a result of physical processes creating these hazards (for example building construction, urban planning, infrastructure provision or transportation), and human processes along with its multiplier effect lead to vulnerabilities (for example, lifestyle choices and consumption (Table 2).

Table 2: Contributing Factors to Vulnerability

Vulnerability Contributing Factors	Vulnerability Contributing Factors
Poverty	People who are already in a depressed state are less able to recover. Some people are even more vulnerable – pregnant women, children and the disabled.
Population Growth	Population has grown dramatically over the past decade.
Rapid Urbanisation	Growing concentration around the capital. For example, two-thirds of the Samoan population lives in Apia.
Transition in Cultural Practices	Increase in sub-standard housing in more heavily populated urban areas. Changes in traditional coping mechanisms – declines in self-reliance, food conservation and preservation, warning systems etc.
Environmental Degradation	As resources are consumed, vegetation cover removed, water polluted and air fouled, a country is more vulnerable to a disaster.
Lack of Awareness and Information	When people and government officials are unaware or lack information about disaster management, they fail to take appropriate actions.
Civil Strife and Unrest	Resources are consumed, people are in a stressed situation, and transportation is restricted.
Geographical Isolation (Socio-Spatial Exclusion)	Island countries are disadvantaged by their relative remoteness, particular their limited access to schools, health and cash.
High Disaster Impact	Limited economies (tourism, agriculture). Disaster impact can affect an entire economy.
Political Uncertainties/Instability	Changing government policies, changing personnel in the national focal point, economic weakness all can contribute to an effective national disaster management programme.

Sources: (VUSSC, 2006)

Study Area

The study takes a case study approach of Ipata area located between latitude 8°26′48.83″ and 8°31′20.36″N and longitude 4°32′17.67″ and 4°35′38.91″E. However, the central area cut across the three (3) Local Government Areas in Ilorin metropolis. The weather is tropical wet and dry climate of average maximum temperature, average minimum temperature and average relative humidity in a year standing at 32.50C (90.50F) of 21.20C (70.20F) and 51.1% respectively (National Ocean and Atmospheric Administration, 2016).

The relief of the study area is gently undulating and the height of the land ranges between 266m to 344m above sea level. Ilorin central area is drained majorly by the Asa River and some seasonal rivers such as Agba, Oyun, Osere, Aluko, Odota, Bude and Are. The drainage pattern in Ilorin is dendritic in nature (Kwara State Diary, 1997). The growth of Ilorin has been greatly

influenced by its status as the state capital, the physical development and the socio-economic activities of the people.

The occupation characteristics of the people in study area comprises of: farm practices in the form of food crops production, local craft such as; cloth weaving, leather works, pottery, mat making etc; trading industrial and administrative activities. Hence, the study area has a major impact on the socio-economic lives of the surrounding communities. However, and more specifically to the study area, the residential housing conditions and densities are characterised by various types of houses present all over the city (Akogun & Ojo, 2013). The communities covered by the study have significantly some levels of slums, pigeon-holed with tenement and contiguous buildings. The residential conditions of the study area bread violence, social exclusion, and vis a vis shows clear evidences of risks. The central area of study as labelled above, best described as socially disadvantaged neighbourhoods, are dominated by the locals (Abdullahi, Seedat-Khan, & Abdulrahman, 2016).

Research Methodology

This study assesses the resilient and vulnerable nature of inhabitant residing alongside river Asa, Ilorin central area of study. This study employed a mixed methods approach, which allows an integration of quantitative and qualitative approaches that facilitate the investigation of socio-economic characteristics of the respondents. Relevant data for this study were obtained through primary, semi-secondary and secondary sources. Questionnaire was one of the veritable tools used to survey the socio-demographic characteristics of the respondents. Observations, interviews, photographs as well as GIS mappings supplemented this research. Semi-secondary and secondary data which includes delineated map of the study area, slope analysis, hill shade analysis, satellite imagery, records of population distribution and extant planning standards in the state were gotten from Town Planning Offices, Government Secretariat and monographs, reports, journals. etc., as these helped in no small measure in the map analysis.

However, the 'beck and call' of this research focuses on inhabitants residing alongside river Asa, Ilorin central area. To this end a buffer analysis of 100m was done on river amounting to 2,800 buildings captured within the 60m buffer. This evidently forms the sampling frame for this research. Due to the homogeneity of the respondents, this research assumes a 5% sampling size amounting to one hundred and forty (140) buildings being considered, since the majority of buildings in the communities were multiple-occupancy, one household per building was selected for the survey. Using systematic random sampling approach to select respondents in the area, every 5^{th} house was sampled and 137 of those questionnaires were validly completed. Data collected were analysed using multiple regression analysis model, the relationship between vulnerability and risk factors was determined as well as their contributory significance. Satellite imagery acquired was analysed in GIS environment to determine the ring buffer of river Asa. Frequencies and Percentages were also employed to analysed the socio-demographic characteristics of the respondents in study area.

Findings and Discussion

The main thrust of this study is to measure the dimensions of vulnerabilities and resilient nature of Ilorin metropolis. However, by way of contrast, macro-level research was preoccupied with

interpreting many dimensions of urban vulnerability in the central area of Ilorin vis-à-vis the Asa river traversing the study area. The research was carried out to review historical and cultural trajectories of urban risks and vulnerabilities, and further interrogate the experiences, perceptions, attitudes and inter-generational, spatial and underlying structural conditions shaping susceptibility of Ilorin Central Business District to disasters.

Socio-Demographic Characteristics:

The questionnaire administration focuses more on the adults of age bracket more than 25 years old, constituting 95.6% of the entire respondents sampled. However, there was a sharp difference between the gender distribution in the study area as 38.0% of respondents recorded were male and the remaining 62.0% to be female. This is in line with extant assumptions that the central area is always dominated by the females (Bako, Aduloju, & Abubakar-Kamar, 2017). Nevertheless, it was observed that 24.8% of the respondent were single, 60.6% were married, while 6.6%, 4.4% and 3.6% were divorced, windowed and separated respectively. From the data collected it was keenly observed that sustainable development goal three (3) still has a long way to go, and essentially have a serious implication on the vulnerability of the Central Business Area. However, a considerable number of respondents representing 5.8%, 9.5% and 8.8% were Illiterates, primary school graduates and JSS/Model School graduates respectively. Furthermore, 33.6%, 19.7% and 21.9% were SSS/Sec/TTC, ND/NCE and University/HND graduates respectively, while 0.7% chose others like Masters and Doctorate degrees (Table2). The implication of the low level of education of the people in the area contributed to why many choose to live in a vulnerable area, as education level represents an important factor in maintaining a stable mental health. (Table 2) aptly shows the occupational distribution of respondents in the study area as literature and extant models of urban land use planning had earlier confirmed Ilorin Central Business Area of study to be business oriented. However, 40.9% of respondents owned up to be engaged in trading and commerce, 17.5% were civil servants, 0.7%, were into farming, 2.2% were industrial workers and while 22.6%, 1.5% and 14.6% were artisans, retirees and others respectively. Table 1 further shows the income levels of the respondents and how these undermines the level of liveability and vis-à-vis its vulnerability of people living in the central area of study as 8.0% number of respondents earned below minimum wage of #18,000 and 37.2% of respondents earn between #18,000 – #30,000, not even up to the amount of #30,000 Nigeria Labour Congress (NLC) is proposing as the new minimum wage while 18.2%, 10.2% 19.0% and 7.3% of the respondents claimed to be earning between #30,001 - #60,000, #60,001 - #80,000, #80,001 - #100,000 and above #100,000 respectively. This clearly shows that level of income of individuals has a direct correlation to vulnerability. Evidently one can infer that the income situation in the study area is terrible, a condition UNDP (2004) labels as "income poverty" – a status whereby a lack of financial resources limits the ability of an individual or household to meet basic needs.

Table 2: Socio-Demographic Characteristics:

Character	Percentage (%)
Gender Distribution	
Male	38.0
Female	62.0
Age Distribution	
18-25 Years	4.4
26-40 Years	57.7
41-60 Years	34.3
Above 60 Years	3.6
Marital Status	
Single	24.8
Married	60.6
Divorced	6.6
Separated	3.6
Widowed	4.4
Type of Employment	
Trading and commerce	40.9
Civil Service	17.5
Farming	.7
Artisan	22.6
Retired	1.5
Industrial Worker	2.2
Other	14.6
Income Level Per Monthly	
Less than #18,000	8.0
#18,000 - #30,000	37.2
#30,001 - #60,000	18.2
#60,001 - #80,000	10.2
#80,001 - #100,000	19.0
Above #100,000	7.3
Total	**100**

Source: Authors' Field Work, 2018

Analysis of Environmental Factors Causing Vulnerability

Land acquisition in the study area indicated that outright purchase accounted for 8.8%, while 11.7% confided that the land belongs to their husbands,12.4%, represents land acquired through inheritance while those who rented the property2.9%. Most of the respondents owned their apartments as this represents 64.2%. Title of land is crucial to this study, this is to ascertain the legality of land ownership in the area, as tenure has been defined as the manner in which a person held or owned real property. To this end, 2.9% respondents agreed that their land title was through "deed of transfer "while the bulk of the respondents representing 65.7% agreed that their land has "no title document" whatsoever, this Omole (2010) classified as squatter settlement – development in which legal right cannot be claimed. Furthermore, 11.7% and 19.7% of respondents lived in houses without "C of O and R of O" respectively. Clearly, there are cyclical links between urban areas, lifestyles and consumption patterns on one hand, and global environmental problems on the other. UNEP (2009) further ascertains that the outlook is even grimmer ifwe consider the accumulated effects and synergy between environmental deterioration and poverty which however, is striking a balance in the study area. Engelking (2008) clearly defines pollution as the contamination of Earth's environment with materials that interfere with human health, the quality of life, or the natural functioning of ecosystems.

It was on this premise that the survey carried out, reveals noise pollution was the most notable form of pollution in the study area as it accounted for 40.1%, while 11.7%, 16.7% and 31.4% of respondents adduce clearly that soil/land, water and air pollution were the most prevalent form of pollution in the study area respectively. However, this study believes there are three (3) dimensions of poverty in the study area. From survey, it was revealed that the study area had 73.8% respondents who were *food poor* while the remaining 17.5% and 2.9% were *shelter* and *clothing poor* respectively. It therefore, safe to say, there exists a tinge of poverty in the land and the population in this central area is gradually moving towards extreme poverty, a condition Corbett (2009) believes threatens people's health or lives, and also known as *destitution* or *absolute poverty.* The actual and potential risk and disasters of the study area was sampled and a considerable 38.0% respondents believe it to be traces of heat wave, 26.3% voted for flooding while 17.5%, 11.7%, 5.1% and 1.5% suggested rainstorm, fire disaster, epidemics and 'others' respectively to be the actual risks and disasters in the study area. In support of this findings, UNEP (2009) adduces clearly that urban areas are not disaster prone by nature; rather the socio-economic structural processes that accelerate rapid urbanisation, population movement and population concentrations substantially increase disaster vulnerability, particularly of low-income urban dwellers. Migrants, for example, settle in areas either originally unsafe (susceptible to floods, landslides, etc), or create the potential of man-made disaster (environmental degradation, slum fires, health hazards). More acceptingly, one can say the study area has been the harbour for poor migrants in Ilorin metropolis.

Regression Analysis of Principle Factors

Alabi & Falola (2003) believes regression is better suited for studying functional dependencies between factors. Better put, how predictors influence the outcome of dependent variables. To this end, the study identifies the relationship between vulnerability (dependent variable Y) and risk factors (predictors X_1-X_n) was determined using simple multiple linear regression model involving dummy variables. In the analysis, the variables were measured as dummy variables using the binary scale (i.e. 0, 1). The regression results show that the overall level of explanation of the explanatory variable, which is significant at 0.05 confidence level, is 46 percent ($r^2 = 0.456$). The results, therefore, reveal that 46% variance in vulnerability of the study area was indeed explained by the predictors in the model, and subsequently, Adjusted R^2 value of (0.304) still upholds the fact that 30% variance in vulnerability that can still be explained by the predictors of the model. However, it's safe to imperatively emphasize that R^2 values value is reliable and considered reasonably above an acceptable range of 15% as postulated by Mitchell and Carson (1989) and further ascertained by Akinyode (2017) that this is acceptable in social sciences when cross-sectional data are taken into consideration. Furthermore, the result, further reveals that three (3) predictors (unregulated land use, level of education and crime & civil unrest) were solely the factors influencing the vulnerability of the study area and significant at ($p< 0.05$). However, a Durbin Watson test using "a rule of thumb" was also conducted to determine the autocorrelation in the residuals. This gives a value of (1.600) considered to be appropriate according to "a rule of thumb" – test statistics values in the range of 1.5 to 2.5 are relatively normal and to further consolidate this, Field (2009) suggests that values under 1 or more than 3 are a definite cause for concerns. This regression analysis further concludes its findings by rejecting the null hypothesis as it was observed that the calculated *F* value of 3.013 is greater than the table *F* value of (2.11) at degrees of freedom (10,36). As ascertained by Panneerselvam (2014), this simply implies that the regression is significant. However, unregulated land use, level of education and crime& civil unrest are clearly the cause of vulnerability in the Ilorin central area of study. Furthermore, the result of

ANOVA shows the *P* value is 0.00 which is less than 0.05, which also proves the earlier stated findings.

Analysis of River Asa as A Major Risk Factor

Rivers are important to humans because they supply fresh drinking water, serve as home for important fisheries, provide transportation routes, and are the source for irrigation water and hydroelectric power. However, it would be of interest to know that River Asa traversing the study area has instinctively lost the aforementioned potentials, as it harbours many district vectors and according to this study recording 31.4% and 63.5% primary cause of "Typhoid and Malaria". To this end, a slope analysis of the area was done in other to ascertain the area of study at risk of flooding. The analysis of the gradient showed that greater proportion of the study area is of the lowest slope of 0.00-1.027341031 at 20 metres. This clearly indicates that over 5.00 hectares will be wet all round (Figure 1.0). This result is in consonance with the findings of Basorun (2018) who carried out similar analysis and ascertained the fact that it will be completely onerous to recover these areas from inundation and ultimately flooding. From analysis, a considerable 26.3% respondents believe flooding to be a friendly disaster in this area due to the fact that human interference has increased the severity of flooding in the study area, as a result of changes in land use such as urbanisation and deforestation. Albeit 38.0% respondents agreed that there exist some traces of "heat wave"- a period of unusually hot weather. Furthermore, a ring buffer analysis was conducted on river Asa at 15m and 30m respectively to actually account for the total number of buildings that have clearly compromised a 30m set back to this natural course considering the fact that a rail line is parallel to the natural course (Figure 2.0). In response to this, a total number of 28 buildings were seen to have clearly compromised the standards at 15m setback and total of 42 buildings at 30m. if the result of the regression analysis is to be recon with, one will can say clearly that, there exist the presence of unregulated land use and squatter settlements. Even from interviews with respondents, a respondent was quoted saying "*the central area provides only food for me, which is not even enough for my family, reason I have to do everything necessary to create shelter close to it."* From all indications and many urban literatures like Benson & Clay (2004), believe that poverty and risk of staying in vulnerable areas share lineage.

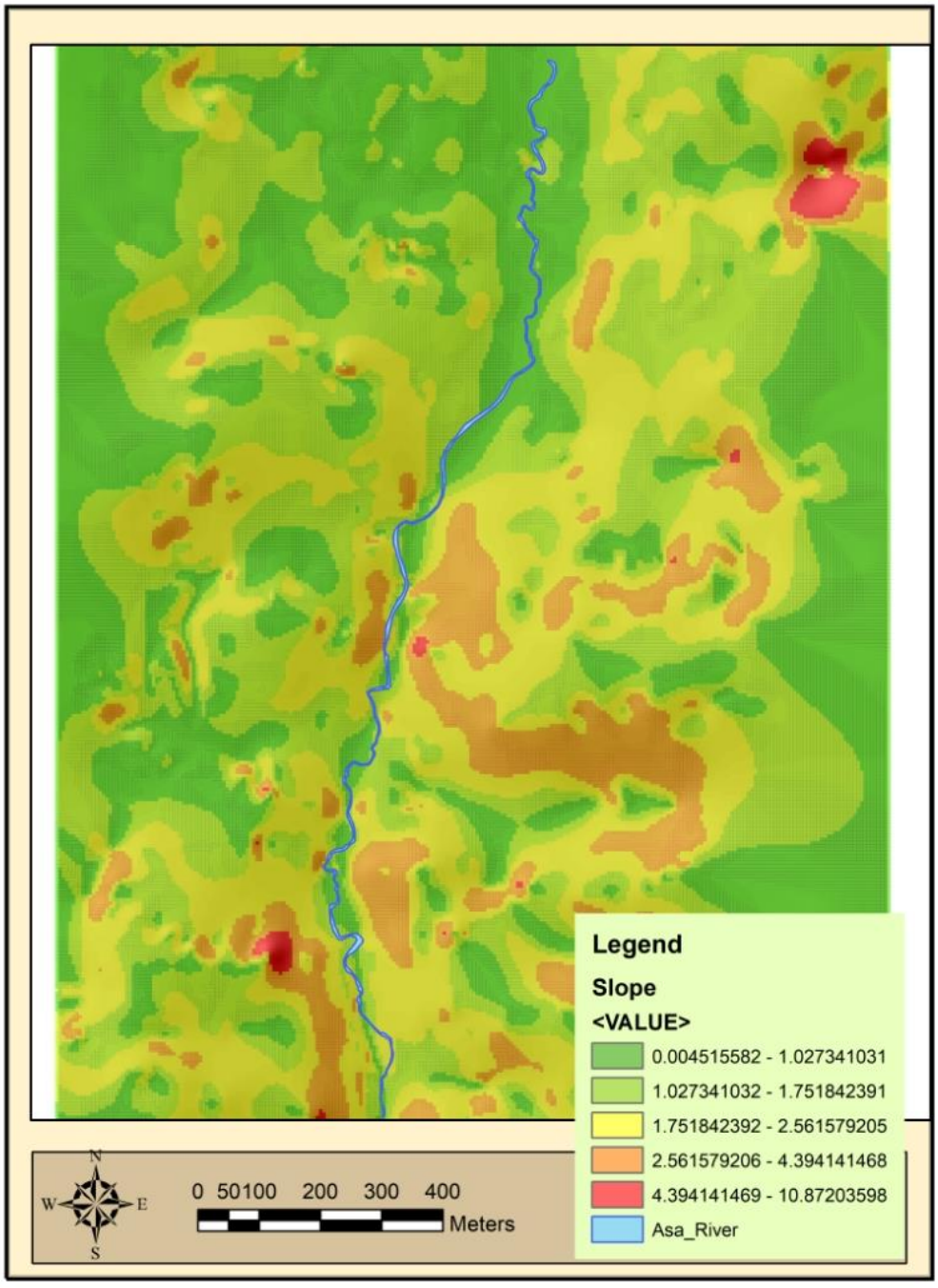


Figure 1.0: Slope Analysis of Ilorin Central Area
Source: Authors' Digitization and Computation, 2019



Figure 2.0: Ring Buffer Analysis of Ilorin Central Area
Source: Authors' Digitization and Computation, 2019

Recommendations

Periodic Risk Assessment:

This is the first step in managing disaster risks, Ilorin central area need to better understand the risks to social, economic, environmental and cultural heritage. This includes understanding the probability of a disaster event as well as it's likely severity. To help stakeholders make time-sensitive decisions, risk mapping can be combined with modern databases of cultural assets that include information on assets' value and location.

Building Codes and Guidelines:

Building codes should ensure resilience as well as compatibility with vernacular building practice and characteristics. The process of developing appropriate building codes and technical guidelines may include harmonizing designs and building materials of new structures with local cultural and natural tradition. However, this will go a long way in regulating the land use in the study area.

Community Engagement:

Ensuring that coordination within local communities in the study area like Ipata, Sango, Thaiwo etc. is extremely important. In some cases, the goal is to raise awareness of the tangible and intangible important assets that can be vulnerable to disaster, and in other cases it is to let communities lead preservation efforts, including in the aftermath of disasters.

Conclusion

Vulnerability is changing quickly, and its growing trend has implications on the national sustainability. While urban vulnerabilities are created directly by global change such as sea level rise and flooding, a number of indirect causes, such as household and hazardous/toxic wastes, pollution etc. are responsible as well, resulting in potentially higher impacts owing to concentrations of infrastructure, government, population and economic activity. In the context of climate change, for example, risks from natural events result from a combination of the nature of the hazard itself, and the intrinsic vulnerability of the affected society and territory. Climate change and its variability are likely to worsen the prospects for poverty eradication unless drastic action is taken to become response-capable. This however, requires a focus on reducing vulnerability, achieving equitable growth and improving the governance and institutional context in which poor people live. Strategies to reduce vulnerability should be rooted in vulnerability analysis like buffer analysis, and greater understanding of household-level and macro response options that are available to decrease the poor's exposure to climate risk. The largest concentration of high-risk urban centres, which are increasingly vulnerable to hazards in sub-Saharan Africa. Risks emanating from combination of vulnerability and hazards need to be better recognized in highly exposed urban areas like Ilorin metropolis, as the potential costs are rising exponentially with economic development**.** Conclusively**,** reliable scientific information is a necessary condition for effective disaster risk management. The international community should support global and regional research and information systems on risk. It should also ensure that there are adequate complementary monitoring and dissemination programs not only at the national level but also at state level.

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