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Response to Tragedy: An Ethnography of Gully Erosion Threats in Three Communities in Edo State, Southern Nigeria

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Abstract

This paper took its departure from a research project on a new programme to address gully erosion and its effects in Auchi and Benin City, Edo State, southern Nigeria. No public policy or strategy to address gully erosion exists and previous government amelioration has been inconclusive. We gathered sociodemographic and other data on 1900 respondents with a questionnaire, interview and direct nonparticipant observation. Among others, we found that gully erosion affected mainly the poor and powerless segment of society; material poverty is underscored by ecological poverty and there is poverty of interventions to check the disaster. Several extant practices aggravate the disaster and there is no communal ameliorative response. We conclude that affected persons are alienated from governments and their environment. Dysfunctional behaviour, nonchalance in the face of disaster point to fatalism and anomie. New policy should address poverty, community education and planning to stem overurbanisation.

Keywords: Affected persons, ecological disaster, gully erosion, poverty, overurbanisation

Introduction

Soil and gully erosions in Edo State have very serious negative impacts on ecological integrity, agricultural productivity, life and property in both urban and rural environments (Egboka *et al.*, 2019; Asema, 2014; Eseigbe & Ojeifo, 2012; Jahantigh & Pessarakli, 2011). These impacts tend to be more severe in urban and peri-urban areas of the state where land resources have become increasingly scarce because of rapid urbanization and very intense land use. In response to increasing devastation of soil and gully erosions in various part of

the country, the Federal Ministry of Environment initiated the Nigeria Erosion and Watershed Management Project (NEWMAP) with Edo State as one of the focal beneficiary states. Designed to be supported with financing from the World Bank, the project aims to adopt a comprehensive watershed management approach in addition to investment in gully erosion prevention and environmental rehabilitation.

The three erosion sites

(a) Oshiobugie flood and gully erosion site

Oshiobugie flood and gully erosion site (OFGES) is located in Auchi, the second largest city in Edo State and headquarter of Etsako West Local Government Area (LGA) in the northern part the state. Auchi urban region (with about 38 settlements) has an estimated population of 232,126 (Onaiwu, 2015) but the population of the continuously built-up area may not be more than 150,000. The city is located within the geographical coordinates of latitude $7^{\circ}4'0.012''N$ and longitude $6^{\circ}16'0.012''E$. OFGES is part of a complex network of incising valleys in the southern slope of Auchi-Agenebode spur on which the city is located. Gully erosion area has a total flooded area of 484 hectares with a length of 1.5km for the main gully. Other pronounced adjoining fingers of the Oshiobugie main gully include Egelessor, Oluedide, Oben Zogo, Iyekhin and Akpekpe Grammer School road gullies (Fig. 1). These fingers pose huge threats to settlements, transportation, agricultural and other land use types (Dalil *et al.*, 2016; Orji *et al.*, 2016; Edo-NEWMAP, 2015).

(b) Queen Ede flood and gully erosion site and (c) West Moat flood catchment

Queen Ede flood and gully erosion site (QEFGES) (Fig. 2) and West Moat flood catchment (WMFC) (Fig. 3) are located in Benin City, capital of Edo State which lies between latitude $06^{\circ}19'E$ and $06^{\circ}21'E$ and longitude $5^{\circ}34'E$ and $5^{\circ}44'E$ with an average elevation of 77.8m above sea level. Benin City metropolitan area has a population of 1,676,000 (2019), making it arguably Nigeria's sixth largest city. Most of the gullies in the city occur on bare soil surfaces created by human and wheeled traffic in off-road locations and also by the removal of topsoils along the roadsides. Gullies usually start as narrow rills with a down slope orientation and develop over time because of increased runoff, which progressively widens and deepens them. Pronounced erosion in this region is responsible for the lowering of the water table. Moreover, the problem of water availability is compounded by poor water quality in the downstream locations where surface water bodies are heavily polluted by suspended particles eroded from adjacent upland and other forms of pollutants. WMFC is an open channel covering over 15 km traversing the three LGAs in the city. On the other hand, QEFGES which started developing in the 1990s after the construction of the Benin-Asaba highway, covers a total land area of $59,250,099m^2$ with a perimeter of 2,219m, making the smallest of the three

sites (Osayande *et al.*, 2019; Osayande, 2017; Esegbe and Gbakeji, 2014; Okoli, 2014; Ehiorobo and Ogirigbo, 2013; Aderemi and Iyamu, 2013).

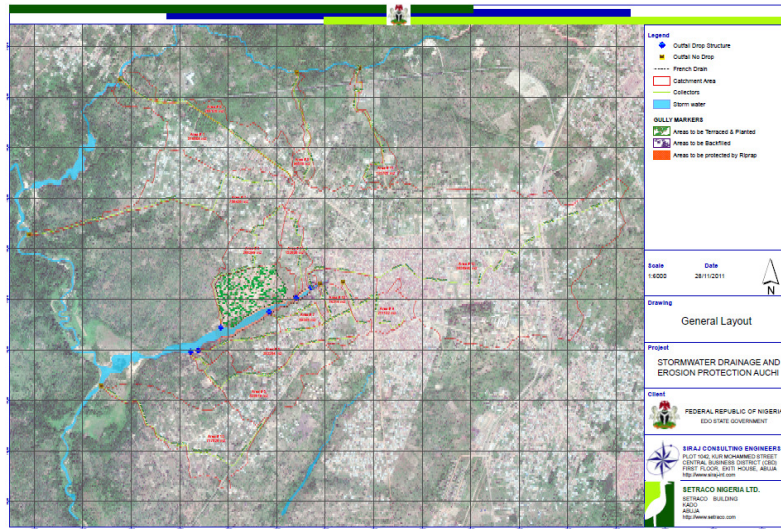


Fig. 1: Aerial view of the Oshiobugie erosion and gully erosion site, Auchi

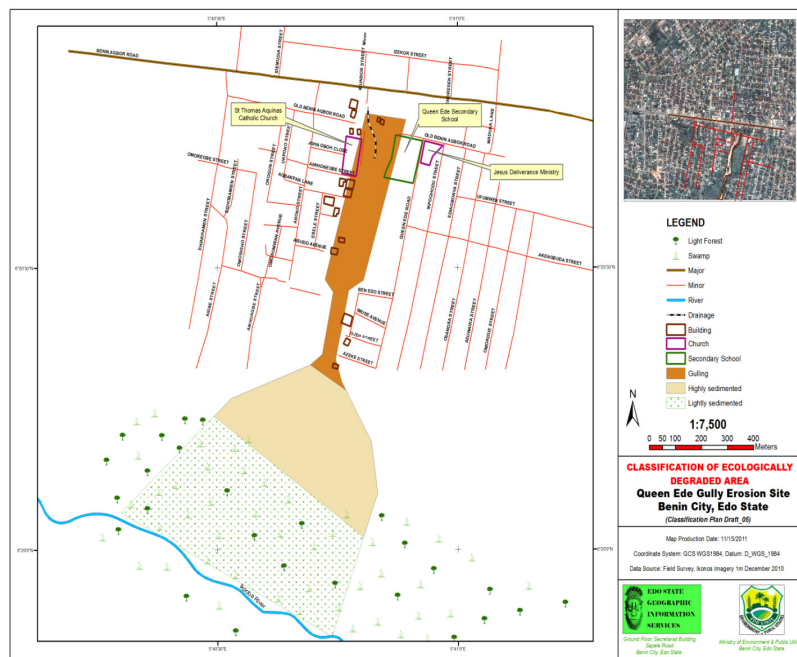


Fig. 2: Queen Ede Flood and Erosion Site, Benin City

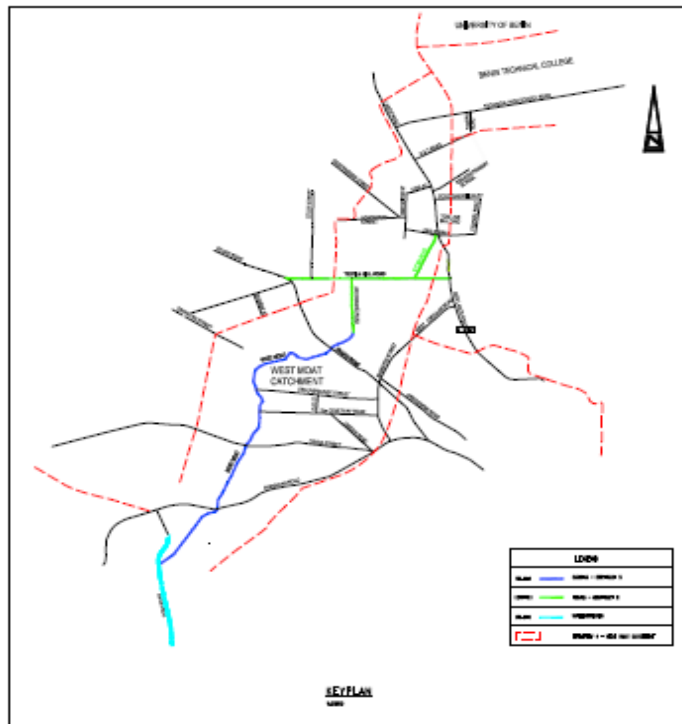


Fig. 3: West Moat Flood Catchment, Benin City

Geographic variables: climate, soil, vegetation and hydrogeology

We consider it important to understand the geographic variables because they are critically implicated in the gully erosion in our research universe. According to the Köppen climatic classification scheme, Edo State falls within humid tropical climate region (Kottek *et al.*, 2006). There is a long rainy (or wet) season between March/April and October/November and a short dry season for the rest of the year. Rainfall, which is usually of high intensity, is a function of the interaction of the tropical maritime and tropical continental air masses which meet along the inter-tropical convergence zone. There is a rainfall double-maxima (in July and September) with a short fairly dry spell known as *August Break*, a period which has become very unpredictable probably because of the freak *el nino* effect. Total annual rainfall ranges from 1800mm to 2780mm and temperature is high all year with a mean of 26°C.

With respect to soils and vegetation, Auchi soil as ferallitic, highly weathered and leached with high proportion of kaolinite and free iron oxide but generally without a lateritic iron pan layer (Areola, 1990). On the other hand, Benin City soil is dark reddish brown, sandy and loamy with a very weak crumb-moderate coarse sub-angular blocky structure. The original vegetation

of Edo State is the equatorial/tropical rain forest but this is being drastically compromised by human activity and, possibly, climate change.

On hydrogeology, Auchi is situated on sediments of cretaceous tertiary and quaternary ages. The various formations in the geology of the region are the Benin, Bende, Ameki, Ogwashi-Asaba, Imo and Nsukka formations (Reyment, 1965). These are underlain by sedimentary rocks with about 90% of sandstone and shale intercalation. The sedimentary rocks of the area constitute the Benin formation which has high potential for ground water reservoir. Moreover, these rocks are highly friable with high susceptibility to erosion (Ofomata, 1965; Floyd, 1965). The Ikpoba River drains approximately 520.3 km² of Benin City.



Plate 1: A major gully erosion finger at OFGES



Plate 2: Houses threatened by gully erosion within OFGES



Plate 3: Inconclusive remediation effort at OFGES

We may consider having these pictures as appendices
The study investigated a tragedy occasioned largely by human despoliation of his physical environment. Whereas the environmental devastation has occurred over a long period of time, ameliorative responses have, at best, been half-hearted and discontinuous resulting in further environmental deterioration (see Plate 2 and 3). The growing despair of the victims and the puerile and ineffectual public response are compounded by their seeming nonchalance. Regrettably, under extant political economy, leadership and public policy are appropriated by an aloof and well-heeled elite which pays no attention to the ecological disaster within its domain.

Methods

After participating in an initial fact-finding research visit to all three sites in at the end of 2011, we designed and carried out this research in 2019 with a socio-economic survey of the immediate communities surrounding OFGES, QEFGES and WMFC. Instruments were nonparticipant observation, a questionnaire other-administered to 1891 affected persons to ascertain their sociodemographic characteristics and an interview with nine key informants, three in each site. All areas within a distance of 100m from the centre of the gullies were covered and data collected on the existing socioeconomic and cultural parameters of the respondents in the affected areas.

Through nonparticipant observation, we conducted a visual aerial reconnaissance of the sites, took fieldnotes and photographic records of the degraded environments (see plates 1, 2, 3 and 4). All the affected persons entered the sample for the questionnaire. Major themes covered include socio-economic indicators such as gender, age distribution, marital status, educational status, occupational/vocational status, income and health status as well as the perceived actions necessary for remediation. Interview respondents did not participate in the questionnaire study and were generally male heads of

households excluding households where the male head is deceased or not available in which case their sons or wives were interviewed.

Findings

As shown in Table 1, the total count of households affected was 1891. Average household size was 11.8, ranging from 1 to 42, with variation from one community to the other. There was a total of 431, 500 and 960 affected households in OFGES, QEFGES and WMFC respectively. Of these 51 per cent (OFGES), 21 per cent (QEFGES) and 13.4 per cent (WMFC) were female respondents respectively. 63 per cent of the respondents was married in OFGES with 64 per cent of the men being in polygynous unions. In QEFGES, 97 per cent was married and only one per cent of the men was polygynous while in WMFC, 83 per cent was married with seven per cent of the men being in polygynous unions. With respect to educational status, 71.9 per cent of the respondents in OFGES was literate and 16.5 per cent had obtained the general certificate of education (GCE) or the senior secondary school certificate (SSCE). In QEFGES, 85.8 per cent was literate with 20.2 per cent having obtained the GCE or SSCE while in WMFC, 92.8 per cent was literate with 19.2 per cent having obtained the GCE or SSCE.

Traders (33.6%) and artisans (23.1%) and peasant mixed crop farmers (15.9%) are the most prominent occupational categories although businesspersons (15.8%) also had a large presence. Farming activities which include artisanal animal husbandry are carried out through traditional techniques. Production is not a market-oriented activity; rather it aims at meeting the basic subsistence needs of the household. Agricultural productivity of the affected persons is therefore very low. Forestry-related activity is very limited or non-existent in the affected areas. Farmers among the affected households cultivate very small family plots and family members are the main source of labour. In addition to the main crops (yams, cassava, maize), some vegetables and fruits are cultivated also for household consumption. Teachers constituted 9.0 per cent while retired persons made up 2.6 per cent of the sample.

Table 1: Sociodemographic characteristics of affected persons

Affected households	OFGES: 431	QEFGES: 500	WMFC: 960	Total: 1891
Sex:				
Male	211 (49.0%)	395 (79.0%)	831 (86.6%)	1437 (76.0%)
Female	220 (51.0%)	105 (21.0%)	129 (13.4%)	454 (24.0%)
Marital status:				
Married	272 (63.0%)	485 (97.0%)	797 (83.0%)	1554 (82.2%)
Others	159 (37.0%)	15 (3.0%)	163 (17.0%)	337 (17.8%)
Polygynous	276 (64.0%)	5 (1.0%)	67 (7.0%)	348 (18.4%)
Monogamous	155 (36.0%)	495 (99.0%)	893 (93.0%)	1543 (81.6%)
Education:				
Nonliterate	121 (28.1%)	71 (14.2%)	69 (7.2%)	261 (13.8%)
Literate	310 (71.9%)	429 (85.8%)	891 (92.8%)	1630 (86.2%)
FLSC	71 (16.5%)	101 (20.2%)	184 (19.2%)	356 (18.8%)
Others	360 (83.5%)	399 (79.8%)	776 (80.8%)	1535 (81.2%)
Religion:				
Christianity	47 (11.0%)	465 (93.1%)	845 (88.0%)	1357 (71.8%)
Islam	376 (87.2%)	7 (1.3%)	0 (0.0%)	383 (20.2%)
Others	8 (1.8%)	28 (5.6%)	115 (12.0%)	151 (8.0%)
Occupation:				
Farming	128 (29.8%)	83 (16.6%)	91 (9.5%)	302 (15.9%)
Artisan	83 (19.3%)	109 (21.8%)	244 (25.4%)	436 (23.1%)
Trading	120 (27.8%)	197 (39.4%)	317 (33.0%)	634 (33.6%)
Business	42 (9.7%)	56 (11.2%)	201 (21.0%)	299 (15.8%)
Teaching	51 (11.8%)	40 (8.0%)	80 (8.3%)	171 (9.0%)
Retired	7 (1.6%)	15 (3.0%)	27 (2.8%)	49 (2.6%)
Monthly income:				
Low (N18,000 and below)	259 (60.1%)	331 (66.2%)	501 (52.2%)	1091 (57.7%)
Medium (N19000-N50000)	109 (25.3%)	97 (19.4%)	328 (34.2%)	534 (28.2%)
High (51,000+)	63 (14.6%)	72 (14.4%)	131 (13.6%)	266 (14.1%)
House occupancy:				
Tenant	301 (69.9%)	399 (79.8%)	707 (73.6%)	1407 (74.4%)
Owner-occupier	20 (4.6%)	65 (13.0%)	158 (16.5%)	243 (12.9%)
Rent-free	110 (25.5%)	36 (7.2%)	95 (9.9%)	241 (12.7%)

A majority of the household heads (82.2%) is married and as we are to expect, 64 per cent of marriages in Auchi is polygynous, being a largely Muslim community. In Benin City which is chiefly a Christian city, a majority of the marriages is monogamous. Literacy rate is very high (86.2%) as Edo State is one of the educationally advantaged states in the country. Over 80 per cent of the respondents have attained more than the first school leaving certificate (FLSC), and owing to the fact that low-income earners are predominant in the sample, a significant majority of 74.4 per cent is constituted by tenants.



Plate 4: Threatened home and damaged open land in OFGES

Sociopolitical structure

Auchi and Benin City, the two largest cities in Edo State, have centralized traditional political organizations headed by strong monarchs who are supported by an elaborate hierarchy of chiefs and palace officials. The traditional sociopolitical structure in Auchi, which has the largest Muslim population in Nigeria's south-south geopolitical zone, is headed by the *Otaru*, who doubles as the head of all Muslims in the city. A fast-growing city, Auchi has imperceptibly merged with the neighbouring South Ibie and Uzairue Clans. The *Otaru* is assisted by a retinue of chiefs who report to him from all the five major quarters of the city. Auchi now has a distinct royalty constituted by the *Otaru* and members of his extended patrilineage as well as an indeterminate number of chiefs (Arunah, 2006). Unlike in the past, members of the royal class have acquired western education and many of them are distinguished businessmen or government officials. Members of the royalty apparently enjoy government patronage over and above everybody else. In spite of the dominance of Islam, Auchi people have embraced western education and Auchi Polytechnic, the oldest tertiary educational institution in Edo State, occupies a prominent place in Auchi urban ecology. The open structure of social stratification in the city has obviously been facilitated by western education.

Benin City, on the other hand, has a more famous and distinguished king, the *Oba* of Benin. This monarch is assisted by a large coterie of *palace* and *town* chiefs and, more importantly, princes who are the administrative heads of

the numerous quarters and villages that constitute the erstwhile Benin kingdom. Traditional rule in Benin City is facilitated not only by a strong and revered *Oba*, but also by a social structure which puts the king above anyone else in every sphere of life (Boudarenko, 2015; Cocodia, 2011; Egharevba, 1991). The reverence of the *Oba* is extended to members of the royalty who together constitute a distinct social class of self-conscious members. Although family descent is patrilineal, women are accorded recognition among the ruling elite and princesses have excelled in politics in the past. Benin traditional social structure also gave prominence to professionals, most especially, sculptors, smiths and musicians. Outside the royalty and professionals, there are no social distinctions among the *hoi polloi*. In spite of reverence for the royalty, modern Benin social structure is marked by an open stratification system as commoners may aspire to royalty by achievement. Popular acceptance of western education has thrown the social structure wide open as no one can depend only on royal blood for ascendancy in modern Benin society.

In addition to the notable traditional sociopolitical and cultural frameworks in Auchi and Benin City, there is a formal modern structure dominated by elected politicians at federal, state and local government levels. However, only the state level of governance seems to have impacted on the lives of the people. At the local level, elected council chairmen and councilors have not positively affected the various communities. Respondents made no reference to them on the challenge of gully erosion and, because they are largely absentee representatives, none of them entered the survey sample in spite of conscious effort to enlist them. We are thus confronted by a constitutional but largely ineffectual modern political sector and a prominent and respected traditional realm in both cities.

Discussion of findings and inferences

(a) Poverty and gully erosion

A visitor or even a casual observer is immediately confronted by the extreme material and environmental poverty of the areas affected by gully erosion. Because the gullies developed from ill-drained and unpaved streets and paths, there is no motorable access to most of the dwelling units. And, perhaps in the false belief that gully erosion may be checked by blocking the channels with domestic wastes, you find refuse everywhere in the gullies and these constitute a malodorous nuisance. The disorder wrought by gullies is worsened by palpable physical planlessness and non-enforcement of the most basic building and environmental standards. Danger posed by the gullies is made even graver by the continued occupation of partly disintegrated houses by people without other alternatives.

Environmental poverty is probably a function of the poverty of the inhabitants of the areas devastated by gully erosion as it is not difficult to imagine that people who continue to live in houses partly destroyed by gully erosion do not have much choice available to them. As shown in Table 1

above, 57.7 per cent of the respondents earn very low incomes of 18,000 naira or below. Such incomes are below the newly introduced but largely ineffectual and unimplemented minimum monthly wage of 30,000 naira in the formal sector. The claimed low-income of the respondents is not surprising as a majority of them (72.6%) is constituted by peasant farmers, petty traders and artisans. Note also that 74.4 per cent of the respondents are tenants who should be expected to move to more auspicious environments if they could afford them. As we can see in Table 2, low-income earners do not count among those who own their accommodation while high-income earners do not count among tenants. Although low-income earners make up 74.4 per cent of the sample, they also make up a sizeable 85.0 per cent of tenants. Thus, in the rundown environment of the gully erosion sites, low-income earners are further disadvantaged. Of the total number of high-income earners in our sample, 90.2 per cent is made up of people who own their houses. The remainder (9.8%) is made up of those living in family houses. It is not farfetched to surmise that high-income earners who can probably afford to move away from a devastated environment keep staying on because they own their properties.

Table 2: Income and house-type

Monthly income	House-type			
	Tenant	Owner-occupier	Free	Total
Low	927 (85.0%)	0 (0.0%)	164 (15.0%)	1091 (57.7%)
Medium	480 (89.9%)	3 (0.6%)	51 (2.8%)	534 (28.2%)
High	0 (0.0%)	240 (90.2%)	26 (9.8%)	266 (14.1%)
Total	1407 (74.4%)	243 (12.9%)	241 (12.7%)	1891 (100.0%)

Further, data in Table 3 show us that low-income earners predominate in all occupational categories except among businesspersons and teachers. We are led to the obvious conclusion that gully erosion sites are restricted to marginal parts of the city to which poor people flock.

Table 3: Income and occupation

Monthly income	Occupation						Total
	Farmer	Artisan	Trader	Business	Teacher	Retired	
Low	300(27.5%)	286 (26.2%)	477(43.7%)	8(0.7%)	5(0.5%)	15(1.4%)	1091 (57.7%)
Medium	2(0.4%)	121 (22.7%)	122(22.8%)	147(27.5%)	121(22.7%)	21(2.9%)	534 (28.2%)
High	0(0.0%)	29 (10.9%)	35(13.2%)	144(54.1%)	45(16.9%)	13(4.9%)	266 (14.1%)
Total	302(15.9%)	436 (23.1%)	634(33.6%)	299(15.8%)	171(9.0%)	49(2.6%)	1891 (100.0)

Because the gullies were probably not there when some of the residents moved in, we conceptualise gully erosion in our three sites as a natural disaster facilitated by human action and/or negligence. This inference does not negate the fact that gullies and mass wasting are principally attributable to hydrological, geological, topographic and environmental conditioning typical of badland topographies (Egbueri and Igwe, 2020; Arabameri *et al.*, 2019). Yet, anthropogenic factors are prominently implicated (Hassen and Batinder,

2020; Abdulfatai *et al.*, 2014; Desta and Adugna, 2012). Urbanisation is the chief driver of gully erosion in our research universe. Because of the rapidity of urban change as well as resource scarcity and poor urban management, many cities have grown beyond their carrying capacities. As a result, most African cities have developed a dual structure with one half well-planned and developed for the elite and the other unplanned and poorly developed half for the poor. Described as the *afropolis* (Okolocha, 2014), African cities are veritable impediments to development and modernity.

In Auchi and Benin City, the areas devastated by gully erosion fall within the unplanned and poorly developed parts of the cities usually referred to as the *core* sector. This is the core where a majority of the population lives, eking out a precarious living in the informal sector of the urban economy. In the cities under our reference, members of the elite class live in parts of the city with all-season paved roads and channeled surface runoffs which prevent the formation of gullies. On the other hand, in the core sectors of both cities, the gullies developed from ill-maintained and unpaved roads and unchanneled surface runoffs. Both the residents and government officials failed to respond right from formative times when it would have been easy to control the embryonic gullies. In theorizing urban ecology, the planned sector and unplanned core sector may be taken to reflect social class distinctions in the city.

(b) Perceptions of affected persons and the new government intervention

In Tables 4 and 5 below, we present the perceptions of the respondents, that is, persons affected by the impact of gully erosion in the three sites under reference in this study. Respondents who marked “strongly agree” as the fixed alternative answer representing their perception are subsumed under “agree” while those who selected “strongly disagree” are subsumed under “disagree.” The magnitude of land wastage in the three gully erosion sites has had a devastating effect on the economic, socio-cultural and psychological life of the affected persons who are quite anxious about the ever-deteriorating environment.

Although there is ample physical evidence of past inconclusive interventions to check gully erosion (Plates 2, 3 and 4), the affected persons appear overly optimistic about the new government initiative (NEWMAP), which has been welcomed as an overdue positive intervention. An aggregate of 61.5 per cent of all respondents felt that the new project will be completed (Table 5). This optimism is more pronounced in QEFGES where a majority of 74.6 per cent of the respondents felt so compared to 61.4 percent in WMFC and an underwhelming 46.6 per cent in OFGES (Table 4). It is understandable that the new confidence has been fired by government which has, in response to allegations by political opposition, given wide publicity to the involvement of the World Bank in the new initiative. In a nutshell, there is intense enthusiasm that through the new project government is about doing something tangible and conclusive to remediate the gullies and prevent further ecological devastation. According to a respondent:

The difference is clear. This new project is different from the ones in the past which were abandoned. World Bank consultants have assured us that the project will not be abandoned unless the state government fails to pay its counterpart funding. Government officials have also told us that the World Bank will not release any money to the contractor if it has not received contribution from the state government. We can see that the contractor is working. That is why we believe that the state has contributed its share of the funds. By the grace of God, we are getting near to the end of the problem of gully erosion in our communities. (*Interview with a chief in Otaru's palace, Auchi*)

As shown in Table 5, a majority of 82.8 per cent of the respondents expressed support the new project (81.2 % in OFGES, 88.4% in QEFGES and 80.5% in WMFC), a prospective view undeterred by the fact that members of the communities were hardly consulted before work to remediate the gullies started and are generally not being carried along by government or the contractor. What is more, 76.3 per cent of all respondents (77.2% in OFGES, 60.2% in QEFGES and 84.2% in WMFC) indicated a certain trust for the contractor, a fact unbounded by the fact that only 5.3 per cent of the respondents (8.4% in OFGES, 4.6% in QEFGES and 4.4% in WMFC) knew the contractor before the company moved to site to start gully remediation works.

Table 4: Public perception on new government intervention

Perception	OFGES: 431			QEFGES: 500			WMFC: 960		
	Agree	Disagree	Don't know	Agree	Disagree	Donk know	Agree	Disagree	Don't know
New project will be completed	201 (46.6%)	155 (36.05)	75 (17.4%)	373 (74.6%)	99 (19.8%)	28 (5.6%)	589 (61.4%)	200 (20.8%)	171 (17.8%)
I support the new project	350 (81.2%)	0 (0.0%)	81 (18.8%)	442 (88.4%)	0 (0.0%)	58 (11.6%)	773 (80.5%)	0 (0.0%)	187 (19.5%)
This is just another contract to enrich some persons	99 (23.0%)	282 (65.4%)	50 (11.6%)	113 (22.6%)	382 (76.4%)	5 (1.0%)	193 (20.1%)	752 (78.3%)	15 (1.6%)
New project is government priority	227 (52.7%)	103 (23.9%)	101 (23.4%)	253 (50.6%)	150 (30.0%)	97 (19.4%)	651 (67.8%)	218 (22.7%)	91 (9.5%)
We know the contractor	36 (8.4%)	379 (87.9%)	16 (3.7%)	23 (4.6%)	466 (93.2%)	11 (2.2%)	42 (4.4%)	891 (92.8%)	27 (2.8%)
We trust the contractor	333 (77.2%)	52 (12.1%)	46 (10.7%)	301 (60.2%)	173 (34.6%)	26 (5.2%)	808 (84.2%)	144 (15.0%)	8 (0.8%)
Project has provided employment	51 (11.8%)	222 (51.5%)	158 (36.7%)	63 (12.6%)	399 (79.8%)	38 (7.6%)	27 (2.8%)	787 (82.0%)	146 (15.2%)
Community was consulted before work started	5 (1.2%)	390 (90.5%)	36 (8.3%)	11 (2.2%)	447 (89.4%)	42 (8.4%)	19 (2.0%)	917 (95.5%)	24 (2.5%)
We're being carried along	43 (10.0%)	312 (72.4%)	76 (17.6%)	35 (7.0%)	388 (77.6%)	77 (15.4%)	22 (2.3%)	889 (92.6%)	49 (5.1%)
Roads and drains will be restored	283 (65.7%)	124 (28.8%)	24 (5.5%)	330 (66.0%)	50 (10.0%)	120 (24.0%)	693 (72.2%)	110 (11.5%)	157 (16.3%)
Government will rebuild houses	40 (9.3%)	381 (88.4%)	10 (2.3%)	4 (0.8%)	473 (94.6%)	23 (4.6%)	17 (1.8%)	903 (94.1%)	40 (4.1%)
Government will resettle victims	2 (0.4%)	411 (95.4%)	18 (4.2%)	7 (1.4%)	461 (92.2%)	32 (6.4%)	11 (1.1%)	940 (98.0%)	9 (0.9%)
Government will give loans for rebuilding houses	2 (0.4%)	421 (97.7%)	8 (1.9%)	7 (1.4%)	448 (89.6%)	45 (9.0%)	3 (0.3%)	952 (99.2%)	5 (0.5%)
New project will enhance communal life	430 (99.8%)	1 (0.2%)	0 (0.0%)	476 (95.2%)	13 (2.6%)	11 (2.2%)	941 (98.0%)	17 (1.8%)	2 (0.2%)
Project will worsen our community	0 (0.0%)	428 (99.3%)	3 (0.7%)	5 (1.0%)	481 (96.2%)	14 (2.8%)	5 (0.5%)	950 (99.0%)	5 (0.5%)

Table 5: Summary of perceptions for OFGES, QEFGES and WMFC (N = 1891)

Perception	Agree	Disagree	Don't know
New project will be completed	1163 (61.5%)	454 (24.0%)	274 (14.5%)
I support the new project	1565 (82.8%)	0 (0.0%)	326 (17.2%)
This is just another contract to enrich some persons	405 (21.4%)	1416 (74.9%)	70 (3.7%)
New project is government priority	1131 (59.8%)	471 (24.9%)	289 (15.3%)
We know the contractor	101 (5.3%)	1736 (91.8%)	54 (2.9%)
We trust the contractor	1442 (76.3%)	369 (19.5%)	80 (4.2%)
Project has provided employment for community members	141 (7.5%)	1408 (74.5%)	342 (18.0%)
Community was consulted before work started	35 (1.8%)	1754 (92.8%)	102 (5.4%)
We're being carried along	100 (5.3%)	1589 (84.0%)	202 (10.7%)
Roads and drains will be restored	1306 (69.1%)	284 (15.0%)	301 (15.9%)
Government will rebuild houses	61 (3.2%)	1757 (92.9%)	73 (3.9%)
Government will resettle victims	20 (1.1%)	1812 (95.8%)	59 (3.1%)
Government will give loans for rebuilding houses	12 (0.6%)	1821 (96.3%)	58 (3.1%)
New project will enhance communal life	1847 (97.7%)	31 (1.6%)	13 (0.7%)
Project will worsen our community	10 (0.5%)	1859 (98.3%)	22 (1.2%)

Positive public perception of the new project is further underscored by the fact that 74.9 per cent of all respondents (65.4% in OFGES, 76.4% in QEFGES and

78.3% in WMFC) felt that it was not just another project to enrich some individuals as they verily believed it was government priority project. As we can see in the tables under reference, 59.8 per cent of all respondents (52.7% in OFGES, 50.4% in QEFGES and 67.8% in WMFC) felt the new project is a priority for government. Note also that 69.1 per cent of all respondents (69.7% in OFGES, 66.0% in QEFGES and 72.2% in WMFC) believe that devastated roads and drains will be restored at the end of the project, while 97.7 per cent (99.8% in OFGES, 95.2% in QEFGES and 98.0% in WMFC) felt that communal life will be enhanced by the project.

From the above perceptions of the respondents, we may rationally presume that there is a conducive environment for the new project in our research universe. The icing on this good fortune is the fact that 98.3 per cent of all respondents (99.3% in OFGES, 96.2% in QEFGES and 99.0% in WMFC) rejected the suggestion that the new project could worsen their lot. Even so, we cannot be oblivious of the fact that only 3.2 per cent of the respondents (9.3% in OFGES, 0.8% in QEFGES and 1.8% in WMFC) felt that government will rebuild houses damaged by gully erosion, a pessimism underscored by the fact that only a tiny minority of 1.1 per cent of all respondents (0.4% in OFGES, 1.4% in QEFGES and 1.1% in WMFC) thought that affected persons may be resettled away from the gully erosion sites. Another leg to the pessimism is the fact that the new project is perceived to have failed in providing employment for the affected persons or members of their households. Further, only 0.6 per cent of all respondents (0.4% in QEFGES, 1.4% in QEFGES and 0.3% in WMFC) believed that government may provide loans for rebuilding damaged houses. This negativity may be conceptualized as a carryover from previous experience as government is notorious for not seeing through many projects it initiates. Attempts in the past to control gully erosion have been discontinuous and it is obvious that such efforts have led to further ecological degradation. According to a respondent:

Our street became impassible because the contractor abandoned the construction of the former drainage channel. After that, we tried to control the flow of rain water by dumping refuse on the channel but these were all washed away. I think it is better not to start any construction if it will not be completed because the problem will be worsened. There should be a law against abandonment of construction projects especially those concerning erosion control. (*Interview with an artisan and landlord, Auchi*)

We may attribute the overly positive outlook on the new gully erosion control project among our respondents in Auchi and Benin City partly to the apparent closeness of the traditional elite to government which has placed them in a better position to know more about the intentions of the latter. For example, the Onogie whose palace is a short distance away from QEFGES confirmed that he

was consulted especially at the initiation of the new project and his cooperation was enlisted. The positive disposition of affected persons may also be attributed to new government propaganda. According to a teacher in Queen Ede Secondary School:

This is the first time government has informed us of a project pertaining the welfare of members of our community. At the beginning, officials of the Ministry of Environment visited us on during their reconnaissance survey, and from then on we have been informed of government plans. I am aware that government officials even went to the market to inform the people there, especially the market women. We have attended meetings at the palace of the Onogie for further information on the project. Even officials from the World Bank have come here and because of that visit, we are more confident that government is serious. I am personally satisfied that this project is well planned and well-funded. (*Interview with a female teacher at Queen Ede Secondary School, Benin City*)

(c) Environmental tragedy and community life

Mass wastage epitomised by gully erosion is an incremental natural phenomenon, which builds on human action and/or inaction. In the city, human actions make or mar the environment and, evidently, gullies build up from the innocuous removal of topsoils. Extant habits implicated in gully erosion include tree felling, unchanneled domestic waste water disposal, unplanned urban development, poor house construction, use of fuelwood, poor/negative soil conservation systems, poor or absolute lack of channelling of storm water, bush burning, indiscriminate excavation of sand, poor road and drainage construction, blockage of natural drainage channels, poor urban governance, etc. (Abdulfatai *et al.*, 2014). We observed that the main gullies in the three sites most probably developed from paved or unpaved streets and paths without drains and, more especially, the nonchalant disposition of the affected persons to environmental challenges.

In Tables 6 and 7 below, our findings on the normative behaviour and existential standards of the affected persons as they relate to their physical environment are presented. As in Tables 4 and 5, the fixed-alternative of “strongly agree” as an answer representing respondents’ perception is subsumed under “agree” while “strongly disagree” is subsumed under “disagree.”

Because erosion is largely a function of poor or inadequate drainage, it is very significant that 94.2 per cent of all respondents (95.8% in OFGES, 86.2% in QEFGES and 97.7% in WMFC) indicated that there is no street drainage in the erosion sites. In OFGES we observed that the main gully was a macadamised street without drainage at some point in the past. Some fingers to the main gully also formed from similarly paved streets without appropriate

drainage. With a view to checking the expansion of the gully, residents often resort to the futile and unhygienic dumping of domestic wastes in the gullies. Although mass wasting has progressed in spite of the dumping of domestic wastes, the habit has been routinized because it is the easiest way to dispose wastes and old habits die hard. Respondents also resort to dumping domestic wastes by roadsides or within their premises and only 15.8 per cent of them (17.2% in QEFGES and 22.2% in WMFC) have their domestic wastes collected. Significantly, the domestic wastes of respondents in OFGES are never collected. Sustained poor disposal has contributed in no small measure to the extant environmental decay throughout the sites.

Tree planting is known to be one of the most effective land conservation strategies. Yet, in spite of calamitous land degradation, only 7.8 per cent of all respondents (1.6% in OFGES, 5.4% in QEFGES and 11.8% in WMFC) has ever planted a tree. Worse still, 86.9 per cent of all respondents (83.1% in OFGES, 87.8% in QEFGES and 88.1% in WMFC) has cut down a tree or plant in the environment. While failure or inability to plant a tree to prevent land wastage by erosion contributes to environmental poverty, it cannot be explained by poverty or ignorance as it may cost nothing or next to nothing to plant a tree, and the people are conscious of the fact that trees can help prevent soil erosion. Rather, we can seek an explanation in the nonchalance of urbanites who generally declaim liability for the environment. For example, 81.5 per cent of all respondents (90.7% in OFGES, 82.4% in QEFGES and 77.0% in WMFC) believes that drainage is a government function. Note that in addition to cutting down trees and failure to plant any, 76.8 per cent of all respondents (76.6% in OFGES, 80.2% in QEFGES and 75.2% in WMFC) cook meals with fuelwood, an environmentally unfriendly activity. Indeed, environmental irresponsibility is a veritable crux of the matter.

Table 6: Environmental behaviour and practices

Behaviour/ practice	OFGES: 431			QEFGES: 500			WMFC: 960		
	Yes	No	Don't know	Yes	No	Don't know	Yes	No	Don't know
There is no street drainage	413 (95.8%)	0 (0.0%)	18 (4.2%)	431 (86.2%)	20 (4.0%)	49 (9.8%)	938 (97.7%)	0 (0.0%)	22 (2.3%)
Domestic waste disposed in gully	223 (51.7%)	208 (48.3%)	0 (0.0%)	348 (69.6%)	152 (30.4%)	0 (0.0%)	718 (74.8%)	242 (25.2%)	0 (0.0%)
Domestic waste dumped in premises/by roadside/ burnt	387 (89.8%)	44 (10.2%)	0 (0.0%)	333 (66.6%)	160 (32.0%)	7 (1.4%)	454 (47.3%)	490 (51.0%)	16 (1.7%)
Domestic waste collected	0 (0.0%)	431 (100.0%)	0 (0.0%)	86 (17.2%)	399 (79.8%)	15 (3.0%)	213 (22.2%)	747 (77.8%)	0 (0.0%)
Tree planted in compound	7 (1.6%)	424 (98.4%)	0 (0.0%)	27 (5.4%)	473 (94.6%)	0 (0.0%)	113 (11.8%)	847 (88.2%)	0 (0.0%)
I've cut down a tree/plant	358 (83.1%)	73 (16.9%)	0 (0.0%)	439 (87.8%)	61 (12.2%)	0 (0.0%)	846 (88.1%)	114 (11.9%)	0 (0.0%)
Cook with fuelwood	330 (76.6%)	101 (23.4%)	0 (0.0%)	401 (80.2%)	99 (19.8%)	0 (0.0%)	722 (75.2%)	238 (24.8%)	0 (0.0%)
Domestic waste- water channeled	0 (0.0%)	431 (100.0%)	0 (0.0%)	28 (5.6%)	472 (94.4%)	0 (0.0%)	43 (4.5%)	917 (95.5%)	0 (0.0%)
Domestic waste- water thrown away	431 (100.0%)	0 (0.0%)	0 (0.0%)	472 (94.4%)	28 (5.6%)	0 (0.0%)	917 (95.5%)	45 (4.5%)	0 (0.0%)
Rain water harvested/channeled	277 (64.3%)	154 (35.7%)	0 (0.0%)	307 (61.4%)	193 (38.6%)	0 (0.0%)	613 (63.9%)	347 (36.1%)	0 (0.0%)
Rain water not channeled	154 (35.7%)	277 (64.3%)	0 (0.0%)	193 (38.6%)	307 (61.4%)	0 (0.0%)	347 (36.1%)	613 (63.9%)	0 (0.0%)
Use pit latrine	399 (92.6%)	32 (7.4%)	0 (0.0%)	397 (79.4%)	103 (20.6%)	0 (0.0%)	711 (74.1%)	249 (25.9%)	0 (0.0%)
Has water borehole	11 (2.6%)	420 (97.4%)	0 (0.0%)	67 (13.4%)	433 (86.6%)	0 (0.0%)	437 (45.5%)	523 (54.5%)	0 (0.0%)
Has water well	2 (0.5%)	429 (99.5%)	0 (0.0%)	59 (11.8%)	441 (88.2%)	0 (0.0%)	79 (8.2%)	881 (91.8%)	0 (0.0%)
Has soak-away (septic tank)	22 (5.1%)	409 (94.9%)	0 (0.0%)	126 (25.2%)	374 (74.8%)	0 (0.0%)	515 (53.6%)	445 (46.4%)	0 (0.0%)
Sand excavated from gully	341 (79.1%)	75 (17.4%)	15 (3.5%)	340 (68.0%)	158 (31.6%)	2 (0.4%)	596 (62.1%)	341 (35.5%)	23 (2.4%)
Government is responsible for drainage	391 (90.7%)	9 (2.1%)	31 (7.2%)	412 (82.4%)	68 (13.6%)	20 (4.0%)	739 (77.0%)	178 (18.5%)	43 (4.5%)
I can help to stem erosion	0 (0.0%)	401 (93.0%)	30 (7.0%)	160 (32.0%)	291 (58.2%)	49 (9.8%)	197 (20.5%)	682 (71.0%)	81 (8.4%)
Community action can stem gully erosion	31 (7.2%)	233 (54.1%)	167 (38.7%)	112 (22.4%)	208 (41.6%)	180 (36.0%)	199 (20.7%)	521 (54.3%)	240 (25.0%)
Building has permit	3 (0.7%)	262 (60.8%)	166 (38.5%)	89 (17.8%)	209 (41.8%)	202 (40.4%)	171 (1.8%)	525 (54.7%)	264 (27.5%)

Even more curious is that only 18.9 per cent of all our respondents (nobody in OFGES, 32.0% in QEFGES and 20.5% in WMFC) believes that individuals can help in stemming soil erosion. It is likely that respondents in OFGES are discouraged by the magnitude of gully erosion, hence no one believes that individual effort could be helpful. An even smaller proportion (18.1%) of all respondents (7.2% in OFGES, 22.4% in QEFGES and 20.7% in WMFC) believes that collective community action can stem gully erosion. These negative dispositions are aggravated by the fact that 67.5% of all respondents (79.1% in OFGES, 68.0% in QEFGES and 62.1% in WMFC) has excavated sand from the gullies, thereby contributing directly to problem under reference. On why people still excavate sand from the gullies even when they are

conscious of the problem posed by the gullies, a respondent in WMFC merely retorted: “I don’t know.” On further probing he added:

Some people use sand taken from the gully to build their own houses, instead of buying sand expensively. Some others excavate sand for sale. Before now, the Council did not stop anyone, but it is now illegal to take sand from the gully. Also, some people don’t believe that the gully will encroach on their houses. (*Interview with a landlord in WMFC*)

Table 7: Summary of behaviour/practices for OFGES, QEFGES and WMFC (N = 1891)

Behaviour/practice	Yes	No	Don't know
There is no street drainage	1782 (94.2%)	20 (1.7%)	89 (4.7%)
Domestic waste disposed in gully	1289 (68.2%)	602 (31.8%)	0 (0.0%)
Domestic waste dumped in premises/by roadside/burnt	1174 (62.1%)	694 (36.7%)	23 (1.2%)
Domestic waste collected	299 (15.8%)	1577 (83.4%)	15 (0.8%)
Tree planted in compound	147 (7.8%)	1744 (92.2%)	0 (0.0%)
I've cut down a tree/plant	1643 (86.9%)	248 (13.1%)	0 (0.0%)
Cook with fuelwood	1453 (76.8%)	438 (23.2%)	0 (0.0%)
Domestic waste-water channeled	71 (3.8%)	1820 (96.2%)	0 (0.0%)
Domestic waste-water thrown away	1820 (96.2%)	73 (3.8%)	0 (0.0%)
Rain water harvested/channeled	1197 (63.3%)	694 (36.7%)	0 (0.0%)
Rain water not channeled	694 (36.7%)	1197 (63.3%)	0 (0.0%)
Use pit latrine	1507 (79.7%)	384 (20.3%)	0 (0.0%)
Has water borehole	515 (27.2%)	1376 (72.8%)	0 (0.0%)
Has water well	140 (7.4%)	1751 (92.6%)	0 (0.0%)
Has soak-away (septic tank)	663 (35.1%)	1228 (64.9%)	0 (0.0%)
Sand excavated from gully	1277 (67.5%)	574 (30.4%)	23 (1.1%)
Government is responsible for drainage	1542 (81.5%)	255 (13.5%)	94 (5.0%)
I can help to stem erosion	357 (18.9%)	1374 (72.6%)	160 (8.5%)
Community action can stem gully erosion	342 (18.1%)	962 (50.9%)	587 (31.0%)
Building has permit	263 (13.9%)	996 (52.7%)	632 (33.4%)

By their actions and behaviour, people inadvertently contribute to environmental despoliation. A good example is how people dispose of domestic waste water. Only 3.8 per cent of all respondents (nobody in OFGES, 5.6% in QEFGES and 4.5% in WMFC) channelled domestic waste water while 96.2 per cent (100.0% in OFGES, 94.4% in QEFGES and 95.5% in WMFC) merely throw domestic waste water away in their premises or the street. Probably because of scarcity of water, respondents were more circumspect about rain water. A total of 63.3% of all respondents (6.3% in OFGES, 61.4% in QEFGES and 63.9% in WMFC) harvested rain water for domestic use or channelled same out of the compound. About a third of the respondents did not bother to channel or harvest rain water, allowing it free flow and potentially contributing to soil erosion. Another damning fact is that only 13 per cent of all

respondents (0.7%, 17.8% and 1.6% respectively in OFGES, QEFGES and WMFC) is aware of official building permits for their houses. This explains the readily observable slapdash afropolitan urban physical development in the Auchi, Benin City and perhaps, most urban centres in Nigeria and elsewhere. Without building permits, houses block or hinder drainage as well as human and vehicular circulation, exposing urban centres to all types of hazards including congestion, erosion, fires, traffic bottlenecks as well as security and sundry challenges. More important, chaotic housing development impedes rational urban development, a necessity in the modern world dominated and symbolized by the city (Nel-lo and Mele, 2016).

Certain other popular activities among our respondents directly weaken the soil and predispose it to erosion. Typical examples are pit latrines, water boreholes, septic tanks (soakaways) and wells which create hollow spaces that could facilitate subsidence. When such earthworks are close to gullies, the prospects and dire consequences of soil subsidence are heightened. A total of 79.7 per cent of all respondents (92.6% in OFGES, 79.4% in QEFGES and 74.1% in WMFC) still use pit latrines; but only 27.2 per cent (2.6% in OFGES, 13.4% in QEFGES and 45.5% in WMFC) has water boreholes. Further, a minority of 35.1 per cent of all respondents (5.1% in OFGES, 25.2% in QEFGES and 53.6% in WMFC) has septic tanks while 7.4 per cent (0.5% in OFGES, 11.8% in QEFGES and 8.2% in WMFC) has water wells within premises. These findings underscore the poor quality of urban life in the areas under reference. It is indicative of the nefarious overurbanisation resulting from rapid and unplanned urban growth alongside increasing poverty in Nigeria.

If we compare some of the data from the three sites (in Tables 6 and 7), certain discrepancies become prominent. For example, respondents in OFGES appear more fatalistic in their perceptions and behaviour as these relate to the physical environment. For example, none of them thinks that he or she can individually help to stop the gully erosion that has devastated their environment. This compares unfavourably with 32.0 per cent in QEFGES and 20.5 per cent in WMFC. Similarly, only 7.2 per cent of respondents in OFGES think that community action can help, compared with 22.0 per cent and 20.7 percent in QEFGES and WMFC respectively. One way of understanding such diversity of disposition in confronting a common problem is the magnitude of devastation which is arguably more far-reaching in OFGES than in the other sites. It may also be that, in accordance with Durkheimian sociology, individuals tend to be more individualistic in response to existential challenges. The individuality of the city alienates people from other-directed or communal actions. Meantime, the ostensible fatalism of OFGES respondents is further underscored by the fact that they are more involved in excavating sand from the gullies and also dump domestic wastes in the gullies more than all others. OFGES respondents are perhaps more involved in these environmentally negative behaviours because of their more limited land space and observably

harsher environment. It is not certain if their more fatalistic disposition has anything to do with religious affiliation.

Further, we notice that more respondents in OFGES (92.6%) use pit latrines compared with 79.4 per cent and 74.1 per cent respectively in QEFGES and WMFC. Contrariwise, only 2.6 per cent of respondents in OFGES has water borehole within premises while the proportion is 13.4 per cent and 45.5 per in QEFGES and WMFC respectively. Because water is comparatively scarcer in Auchi, it more convenient for respondents in OFGES to resort to pit latrines. Water boreholes and wells are far fewer in OFGES than in other sites and this explains why there are very limited septic tanks in OFGES. The converse of this argument is true, namely, that there are more septic tanks in QEFGES and WMFC because of more abundant ground water supply as evidenced by the presence of more water boreholes and wells.

Our findings in relation to the perceptions and behaviour of respondents derive from their ingrained dispositions and ways of living and profound failure to evolve new adaptations to modern urban life. Poverty is a reinforcing factor. For example, failure to obtain building permits may be a carryover from traditional architecture and housing development where the decision lies with the household head. Thus, land ownership in the city is deemed sufficient for housing development without recourse to extra costs incurred through fees for building design, plan approvals and formal titles to land. Disposal of domestic waste also falls within the purview of traditional behaviour. The management of the low quantum of largely biodegradable wastes generated by the traditional household was never a challenge, requiring mere dumping in the backyard. Increased wastes generated by modern urban households (which include non-biodegradable materials like plastics, glass, metals and ewastes) cannot be efficiently handled through the traditional disposal system, yet modern public waste management agencies are notoriously ineffectual. Similar argument may be made for tree felling and failure to plant, disposal of domestic waste water, cooking with fuelwood and the sinking of water wells.

Wherever public agencies fail to deliver modern urban infrastructure or services, residents are obligated to fall back on old inappropriate ways in modern society. For example, in the Nigeria urban sphere, the civic duty of tree planting has not been cultivated and in the hinterland where loggers are required to replant, the regulation is never enforced. On cooking with fuelwood, it is arguably the cheapest and most readily available alternative as the country's abundant petroleum and natural gas resources are too expensive and/or unavailable. Of course, fuelwood is implicated in deforestation, itself deeply implicated in soil erosion. Even more bizarre is the scarcity of potable water. Apparently, water has been privatised with households responsible for their own supply, resulting in the proliferation of water wells, boreholes and *pure water* (that is, water of uncertain quality packaged in 60cl plastic sachets). In our research universe, public potable water is entirely non-existent, with dire health consequences for the people (dos Santos *et al.*, 2017).

Further discussion and policy implications

One of the key inferences from our findings relates to the superficially paradoxical data recorded in Tables 4 and 5, and again in Tables 6 and 7. In the former we found that the affected persons seem, on the one hand, to have considerable confidence that government was serious in its new erosion control initiative and therefore expressed their support in spite of previous disappointments. On the other, the same people believed that government will not resettle them, or rebuild their houses damaged by gully erosion. They also did not look forward to any loans for the reconstruction of houses. Next, in Tables 6 and 7, we see that absence of street drainage was attributed to government, a function they do not expect it to fulfil. Therefore, we conceptualise our respondents as eclectic people with dynamic perceptions and dispositions. In spite of their optimism, they are resigned to the reality of their situation, never oblivious disappointment. The policy implication is that populism cannot obfuscate alienation. Ultimately, people are never carried away. Present support for NEWMAP is a specific and narrow response that cannot be expected to obliterate past or extant experience characterised by inconsistency, or ensure similar future positive response or abjuration.

Moreover, consciousness of environmental degradation has not triggered any local individual or communal remedial action. Rather our data point to a people steeped in their old environmentally inauspicious ways and practices. Theoretically, this points to *environmental alienation*, a situation where problems of the environment do not cause problem-solving actions (or reactions). Our findings indicate that environmental alienation has degenerated into fatalism as evidenced in activities like excavation of sand from gullies, indiscriminate waste disposal, felling of trees and failure to any, disorderly property development, etc. By their actions, people further despoil their environment. Likewise, without any form of enforcement of any regulations, urban development in our research universe is a free-for-all process resulting in environmental or physical anarchy. Thus, environmental alienation and fatalism have evidently created environmental anomie, a reality accentuated by the fact that neither the active traditional nor the emergent political class has shown any leadership in the environmental challenge of gully erosion facing both cities. Environmental alienation, fatalism and anomie impel a policy paradigm shift in environmental remediation and urban development.

If, as we have seen, environmental poverty and degradation are largely a function of the poverty of the people, it follows that environmental remediation without poverty reduction and empowerment will be futile. Indeed, urban ecology tends to rationalise the qualities of different parts of the city in terms of a synergy between the local environment and the people (Cengiz, 2013). For explicable reasons, poor people tend to converge in *core sectors* of the city and those areas even poorer. Thus, people cannot be separated from their environment, thereby requiring that fixing the environment should involve fixing the people.

As with all disasters, gully erosion may be effectively prevented by early identification and remedial intervention. Early awareness and timely responsive action are not only easier and more cost effective but also largely dependent on sustainable local action or initiatives. If they are to be effective, early awareness and responsive behaviour require institutionalization of environmentally friendly practices by affected persons and the citizenry in general. Where appropriate or desirable normative behaviours are lacking as in our research universe, policy intervention should focus on initiating and institutionalising best practices that negate erstwhile dysfunctional behaviour. Nonetheless, changing established human behaviour and introducing new standards are usually arduous and slow processes. Civic education is perhaps one of the best ways of introducing, institutionalising and internalising desirable practices.

To change old habits implicated in gully erosion, short-term and long-term measures need to be adopted and implemented *pari passu*. While in the short-term physical environmental remediation may be achieved through implementation of NEWMAP, only a more gradual process of community or civic education may be able to sustain success in the long run. Community education is conceptualised as an empowerment intervention which may include desirable short- and long-term measures such as consultation for the purpose of enacting byelaws for tree planting, waste water channelling and planting of hedges by households; preparing, filming and screening of documentaries on environmentally unfriendly and unsustainable human behaviour; alleviation and eradication of poverty; household ownership of, at least, one tree; modern effective waste management; instituting Tree Planting Clubs and tree planting competitions in all educational institutions; annual tree exhibition; and popularizing the so-called green economy. Above all, new public policy should circumscribe the *right to the city* inherent in free-for-all urbanisation with purposive planning and enforcement to reverse overurbanisation and create functional cities.

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