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Fear-Avoidance Feedback Loops in the Social Production of Unsafe Riverfront Space along the Otamiri River, Owerri

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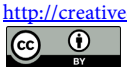

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Abstract

This study examines how fear of crime, environmental conditions and changing patterns of public-space use interact in the social production of unsafe riverfront space along the Otamiri River in Owerri, Nigeria. Guided by Routine Activity Theory, the study extends the concept of capable guardianship by examining how fear-driven behavioural withdrawal can itself weaken legitimate presence and informal surveillance. A qualitative single-case study design was adopted, drawing on 20 semi-structured interviews with residents and users, field observations and visual documentation. Thematic analysis identified five interrelated patterns: temporalised fear, environmental neglect and perceived crime opportunity, deficits in formal and informal guardianship, spatial and social withdrawal, and the reputational reproduction of insecurity. Participants associated poor lighting, unmanaged vegetation, perceived weak surveillance and circulating crime narratives with danger and avoidance of particular locations and periods. The study proposes that such avoidance may reduce legitimate activity and passive observation, reinforcing isolation and perceived insecurity. The study conceptualises this process as a fear-avoidance-guardianship feedback mechanism, extending Routine Activity Theory by treating guardianship as dynamic, socially produced and potentially self-eroding. The findings highlight the need for integrated riverfront interventions combining environmental maintenance, improved visibility, strengthened security and the restoration of legitimate social activity.

Subject Areas

Criminology

Keywords

Environmental Neglect, Fear of Crime, Informal Guardianship, Riverfront Safety, Routine Activity Theory, Spatial Avoidance

1. Introduction

Urban riverfronts constitute important interfaces between ecological systems and everyday urban life, providing opportunities for recreation, mobility, social encounter and contact with nature. Their value, however, depends not simply on formal accessibility but on whether people feel sufficiently safe to enter, remain in and move through them. Contemporary research increasingly demonstrates that fear of crime can constrain access to public space independently of actual victimisation, influencing where people go, when they travel, the routes they select and the activities they undertake [1]-[3]. Riverfronts are particularly important in this regard because their spatial configuration often combines natural vegetation, transitional land uses, variable visibility and uneven intensity of human activity. Although urban rivers are increasingly being reclaimed as recreational and socio-ecological spaces, their capacity to function as genuinely public landscapes therefore rests partly on how users interpret environmental and social signals of safety [4]. Evidence from Nigeria further shows that crime is spatially concentrated rather than randomly distributed, reinforcing the importance of investigating the micro-spatial conditions through which particular places acquire reputations for danger [5]. Along the Otamiri River in Owerri, concerns about insecurity have similarly been associated with withdrawal from the riverfront, avoidance of particular locations and negative representations of the area, thereby undermining its social and recreational functions.

The persistence of this problem cannot be explained adequately by criminal incidents alone. Perceived safety emerges from the interaction of remembered or experienced crime, environmental conditions, social information and users' interpretation of vulnerability. Research in South Africa, for example, shows that perceived crime hotspots and actual crime locations do not necessarily coincide because fear is also mediated by physical disorder and characteristics of the built environment [6]. Similarly, a Nigerian study of urban recreation sites found that users' safety perceptions and avoidance behaviours varied according to time, environmental attributes and personal characteristics and did not simply mirror the temporal distribution of recorded crime [2]. Environmental conditions are especially influential after dark. Poor lighting, restricted visibility and unmanaged vegetation can generate feelings of entrapment and encourage route avoidance, whereas the presence of other legitimate users can improve perceived safety [7]. Studies of urban parks likewise identify maintenance, visibility, undesirable activities and the presence or absence of other users as important fear-evoking conditions [8]. The underlying Otamiri study similarly identifies inadequate lighting, dense veg-

etation, deficient surveillance and weak public-space infrastructure among the environmental conditions associated with insecurity. These conditions are important because they influence not only perceptions of danger but also the spatial and temporal routines through which people occupy the riverfront.

A useful theoretical basis for understanding these relationships is Routine Activity Theory (RAT). Originally formulated by Cohen and Felson [9], RAT proposes that criminal opportunity is more likely where a motivated offender, a suitable target and the absence of a capable guardian converge in time and space. Its relevance to public-space safety lies particularly in the concept of capable guardianship. Guardianship need not consist solely of police officers or formal security personnel; ordinary users, nearby residents, passers-by and organised activities can also contribute to surveillance and reduce opportunities for offending through their routine presence. Contemporary research on parks reinforces this contextual interpretation. Boessen and Hipp [10] demonstrate that crime in and around parks is strongly shaped by surrounding land uses and neighbourhood characteristics, while Taylor, Haberman and Groff [11] show that park features interact with surrounding crime, socioeconomic conditions and social cohesion. In this sense, the safety of a public space is partly dependent on the routines through which legitimate users repeatedly occupy and observe it. However, conventional applications of RAT tend to treat guardianship principally as a condition whose presence or absence affects criminal opportunity. They provide less explanation of how fear itself may alter routine activities and consequently produce a decline in guardianship. This limitation is especially important in weakly managed public spaces, where everyday human presence may constitute a significant component of informal surveillance.

Existing scholarship explains important elements of this process, but the evidence remains comparatively fragmented. Environmental-criminological research has established that crime and fear are situational and place-sensitive [1], while contemporary Crime Prevention Through Environmental Design research shows that lighting, visibility, spatial configuration and environmental management can influence both crime opportunity and feelings of security [12]. Experimental evidence further demonstrates that modifications to public-space design can significantly alter perceived safety [13], while nature-based interventions may improve perceptions of security when environmental quality and visibility are appropriately managed [14]. Recent work similarly emphasises that nighttime safety cannot be explained by isolated design variables because environmental conditions, surrounding land uses and social presence interact [15]. At the behavioural level, Odufuwa *et al.* [2] show that insecurity can lead users to avoid particular places and periods, while studies of park visitation indicate that exposure to crime can depress subsequent use [3] [16]. Yet these strands are generally examined separately: environmental studies ask how physical conditions influence fear; criminological studies examine the circumstances that structure crime opportunities; and recreation studies investigate how safety affects visitation. Less attention has

been given to the possibility that these relationships are recursive. If perceived insecurity causes users to withdraw, the consequent reduction in legitimate presence may weaken precisely the informal guardianship emphasised by RAT. In turn, declining guardianship, greater isolation and visible underuse may provide additional signals through which subsequent users interpret the space as unsafe.

This paper addresses that conceptual gap by using Routine Activity Theory as its principal theoretical lens while extending attention from the conventional convergence of offenders, targets and guardians to the behavioural processes through which guardianship itself may be weakened. It conceptualises insecurity along the Otamiri River corridor as a fear-avoidance feedback loop. The proposition is that environmental neglect, experiences or narratives of crime and weak formal surveillance can contribute to perceived insecurity; perceived insecurity can encourage spatial and temporal avoidance; avoidance can reduce legitimate occupation and informal guardianship; and declining legitimate presence can make isolation, disorder and threatening environmental cues increasingly salient, thereby reinforcing subsequent fear. The argument does not assume that avoidance directly causes crime, nor does it suggest that all underused spaces inevitably become criminal. Rather, it proposes that fear-induced behavioural withdrawal can alter the routine social conditions under which guardianship and perceptions of risk are produced. In this respect, the framework complements RAT by treating capable guardianship not as an entirely fixed external condition but as a dynamic and behaviourally contingent resource that can strengthen or deteriorate through changes in everyday public-space use.

Empirically, the paper examines this proposition through the Otamiri River corridor in Owerri, using qualitative evidence generated through semi-structured interviews with residents and users, field observation and visual documentation. The analysis therefore asks not only why particular sections of the riverfront are perceived as unsafe but also how such perceptions alter users' routines, including the time of visitation, movement routes, duration of stay, willingness to use isolated sections and participation in collective activities. This emphasis allows the study to connect subjective fear with observable changes in patterns of occupation and, consequently, with the conditions under which informal guardianship is produced. The Otamiri setting is particularly relevant because much of the detailed literature on park safety and environmental design has been developed in formally planned and comparatively well-managed public spaces in Europe, North America and East Asia, while evidence from informally used riverfronts in secondary African cities remains limited [17]. Investigating a weakly managed Nigerian riverfront therefore provides an opportunity to assess how environmental conditions, routine activities and guardianship interact where institutional management and programmed public-space use are comparatively limited.

By bringing these elements together, the study makes conceptual, empirical and planning contributions. Conceptually, it extends the application of Routine Activity Theory by identifying fear-driven guardianship erosion as a process through

which perceived insecurity can modify routine activities and, indirectly, the social conditions of public space. The resulting fear-avoidance framework connects environmental cues, anticipated victimisation, behavioural adaptation and changing guardianship within a single explanatory sequence. Empirically, the study contributes evidence from an underrepresented Nigerian riverfront context where the distinction between natural landscape, neglected urban space and everyday public space is less institutionally defined than in conventional parks. This contextual contribution is important because the safety effects of environmental design and surveillance cannot simply be assumed to operate identically across differing social and spatial settings [12] [17]. From a planning perspective, the framework suggests that improving riverfront safety requires more than isolated physical or policing interventions. Lighting, vegetation management, visibility and formal security remain important, but interventions should also seek to restore legitimate activities, social occupation and routine presence so that informal guardianship is strengthened rather than progressively lost. The paper therefore treats fear reduction not merely as a psychological or security objective, but as an essential condition for restoring the social functionality of neglected riverfront space.

2. Literature Review

Urban riverfronts are increasingly understood as multifunctional public landscapes where ecological processes, mobility, recreation and everyday social life intersect. Their public value, however, is not secured by physical accessibility alone; it also depends on whether users perceive the setting as sufficiently safe to enter, remain in and move through. Durán Vian, Pons Izquierdo and Serrano Martínez [4] show that riverfront spaces differ substantially in their spatial relationship to the river, patterns of access and potential recreational use, making their social performance highly sensitive to design and management conditions. This is particularly relevant where a riverbank functions as public space without the institutional clarity, maintenance regime or programmed activity of a formal park. In such settings, safety becomes part of the mechanism through which a riverfront is effectively opened or closed to everyday use. Contemporary green-space research similarly indicates that perceived insecurity can undermine the social and recreational benefits expected from public open spaces, even when such spaces are technically accessible [17]. Consequently, the Otamiri riverfront is best understood not merely as a physical river corridor but as a socially negotiated public environment whose usability depends on interactions among environmental condition, perceived risk and patterns of human presence.

Fear of crime is central to this negotiation because perceived safety does not simply reproduce objective crime levels. Rather, users interpret risk through a combination of direct experience, environmental cues, social information and perceived personal vulnerability. Evidence from Nigerian recreational sites demonstrates that the timing and distribution of recorded crime do not necessarily correspond with when and where users report feeling unsafe; users may avoid partic-

ular locations or periods because of anticipated rather than experienced victimisation [2]. Mak and Jim [8] likewise found that fear in urban parks was shaped by multiple dimensions, including design and management conditions, the presence of undesirable activities or users, and personal characteristics. This distinction is important because it shifts the analytical focus from crime as an event to fear as a spatially consequential interpretation of place. When fear becomes embedded in routine decision-making, it influences whether residents enter a space, which routes they take, how long they stay and whether they use it after dark. Thus, the literature supports treating fear not as a secondary psychological response to crime, but as an active mechanism capable of reorganising everyday spatial behaviour and, by extension, the social life of public space.

The built and natural environment provides many of the cues through which such risk is interpreted. Research on Crime Prevention Through Environmental Design has consistently emphasised visibility, lighting, access control, territorial definition and maintenance as conditions that can influence both opportunities for crime and perceptions of security; however, the effects are context-dependent rather than mechanically deterministic [12]. In a randomised urban-design experiment, Navarrete-Hernandez, Vetro and Concha [13] found that interventions that improved visibility and reduced threatening environmental signals significantly enhanced perceived safety, with particularly important effects for women. Similarly, Navarrete-Hernandez and Afarin [14] demonstrate that nature-based interventions can reduce fear when natural elements are designed in ways that retain visibility and legibility. This qualification is critical for riverfront environments, where vegetation can simultaneously provide ecological and aesthetic benefits while producing concealment, blocked sightlines or uncertainty when poorly managed. Recent nighttime park research further shows that lighting, vegetation maintenance, visibility and social presence interact rather than operate as isolated variables [15]. The implication is that environmental neglect matters not simply because it looks unattractive, but because it can alter users' reading of surveillance, escape, concealment and institutional care, thereby contributing to the production of perceived danger.

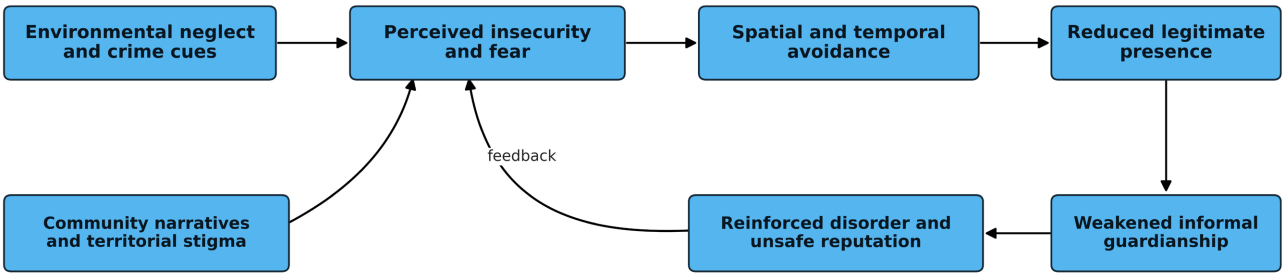
Yet environmental cues alone cannot explain why some public spaces remain relatively safe and active while others with similar physical characteristics become associated with crime and avoidance. The surrounding social context and the availability of formal and informal guardianship are equally important. Boessen and Hipp [10] show that crime in and around parks is strongly conditioned by the land uses and socio-demographic characteristics of surrounding areas, demonstrating that public-space safety cannot be analysed independently of its wider urban context. Taylor, Haberman and Groff [11] similarly found that park crime reflects an interaction among park features, nearby crime, neighbourhood socioeconomic conditions and social cohesion. These findings strengthen the argument that legitimate human presence can itself function as a safety resource: regular users, adjacent residents, vendors, passers-by and organised activities increase ob-

servation, predictability and opportunities for informal intervention. Conversely, weak social cohesion, low levels of activity and sporadic security presence can create what may be termed a guardianship deficit. Clarke *et al.* [17], in their review of urban greenspaces, reinforce this relationship by showing that safety, maintenance, accessibility and opportunities for social interaction are among the strongest factors supporting social cohesion, whereas crime, neglect and inaccessibility can lead to underuse or abandonment. In this sense, safety is partly produced through the social occupation of space.

Routine Activity Theory (RAT) provides the principal theoretical lens for connecting these environmental and social conditions to patterns of public-space use. Originally formulated by Cohen and Felson [9], RAT proposes that crime opportunities are more likely to emerge when a motivated offender and a suitable target converge in time and space in the absence of capable guardianship. Its relevance to the present study lies particularly in the concept of guardianship. In public spaces, guardianship need not be limited to formal policing or security infrastructure; it can also be generated through the ordinary presence of residents, passers-by, vendors, organised activities and other legitimate users whose presence increases observation and reduces anonymity. Contemporary park research supports this broader interpretation. Boessen and Hipp [10] demonstrate that park crime is strongly conditioned by surrounding land uses and neighbourhood characteristics, while Taylor, Haberman and Groff [11] show that park features interact with nearby crime, socioeconomic conditions and social cohesion. Clarke *et al.* [17] similarly emphasise that safety, accessibility, maintenance and opportunities for interaction contribute to the social vitality of urban greenspaces. However, conventional applications of RAT generally treat capable guardianship as an antecedent condition that influences crime opportunity; they pay less attention to how fear of crime may itself alter routine activities and progressively weaken guardianship. This limitation is central to the present study. If users respond to insecurity by avoiding particular locations, restricting visits to daylight hours or abandoning activities that ordinarily generate social presence, then guardianship becomes not simply absent but behaviourally depleted through fear-induced withdrawal. RAT therefore provides the foundation for understanding why changes in everyday routines may have consequences for the continuing social production of unsafe space.

Viewed through this extension of Routine Activity Theory, the behavioural consequence of perceived insecurity becomes especially important because avoidance can modify the very conditions on which future safety perceptions and guardianship depend. Odufuwa *et al.* [2] found that users of Nigerian recreation sites responded to insecurity by avoiding particular places and times, demonstrating a clear temporal and spatial contraction of public-space use. More recent longitudinal evidence strengthens the behavioural argument: Zhang *et al.* [16], analysing 208 urban parks, found that recent non-family violent crime was associated with short- to medium-term declines in daily visitation, showing that crime exposure

can depress use beyond the immediate moment of an incident. When fewer legitimate users are present, opportunities for passive observation and spontaneous social interaction are correspondingly reduced, while isolated areas may appear less controlled and more uncertain to subsequent users. This suggests a recursive mechanism rather than a simple one-way relationship. Fear can produce avoidance; avoidance can reduce legitimate presence and informal guardianship; diminished presence can make neglect, isolation and threatening cues more salient; and these conditions can reinforce subsequent fear. The significance of this mechanism is that a public space may become progressively less usable even without a continuous increase in recorded crime. The fear-avoidance feedback loop therefore connects psychological perception to observable spatial behaviour and, ultimately, to the changing social character of place (See **Figure 1**).



Source: Authors' synthesis from Mak and Jim [8], Odufuwa et al. [2], Taylor et al. [11], Clarke et al. [17] and Zhang et al. [16].

Figure 1. Fear-avoidance feedback loop in the social production of unsafe riverfront space.

A further layer of this process concerns the reputational construction of unsafe places. Territorial-stigma scholarship demonstrates that spaces acquire meanings that exceed their measurable physical and socioeconomic conditions. Sisson [18] argues that territorial stigmatisation is produced through material, institutional and symbolic processes that attach disrepute to particular places, with consequences for how they are treated and experienced. This is directly relevant to crime-related reputations because repeated stories of violence, abandonment or disorder can stabilise an image of a location as dangerous, even among people with limited direct experience of victimisation. Jeong and Gim [19] provide empirical evidence that territorial stigma is significantly associated with neighbourhood crime, suggesting that symbolic inequality and crime can be mutually implicated rather than analytically separated. Applied to public space, this means that fear is not generated only by what a person sees during a visit; it can also precede the visit through community narratives and accumulated place reputation. Once a riverfront is routinely described as unsafe, non-use can become socially normalised, while the absence of ordinary users may visually confirm the reputation. Territorial stigma thus helps explain how fear-avoidance loops can persist over time and become socially reproduced.

The geographical distribution of existing evidence, however, limits how confidently these relationships can be transferred to secondary African cities and in-

formally managed riverfronts. Research from Nigeria confirms that crime is spatially concentrated and that place-specific analysis is necessary for understanding urban crime patterns rather than relying on citywide averages [5]. Nigerian evidence also shows that perceptions of personal safety are influenced by environmental attributes, time of use, user characteristics and avoidance behaviour [2]. Nevertheless, much of the detailed literature on park safety, environmental design and nighttime perceptions has been generated in formally planned and comparatively well-managed public spaces in Europe, North America and East Asia [8] [13] [15]. Clarke *et al.* [17] explicitly identify the need for greater contextual diversity, particularly research from developing-country settings. This gap is important because an informally used riverbank may have unclear territorial boundaries, irregular maintenance, limited formal surveillance and few programmed activities. Such conditions make it necessary to examine how safety is socially produced under weak management rather than assuming that findings from formal parks transfer directly to river corridors such as Otamiri.

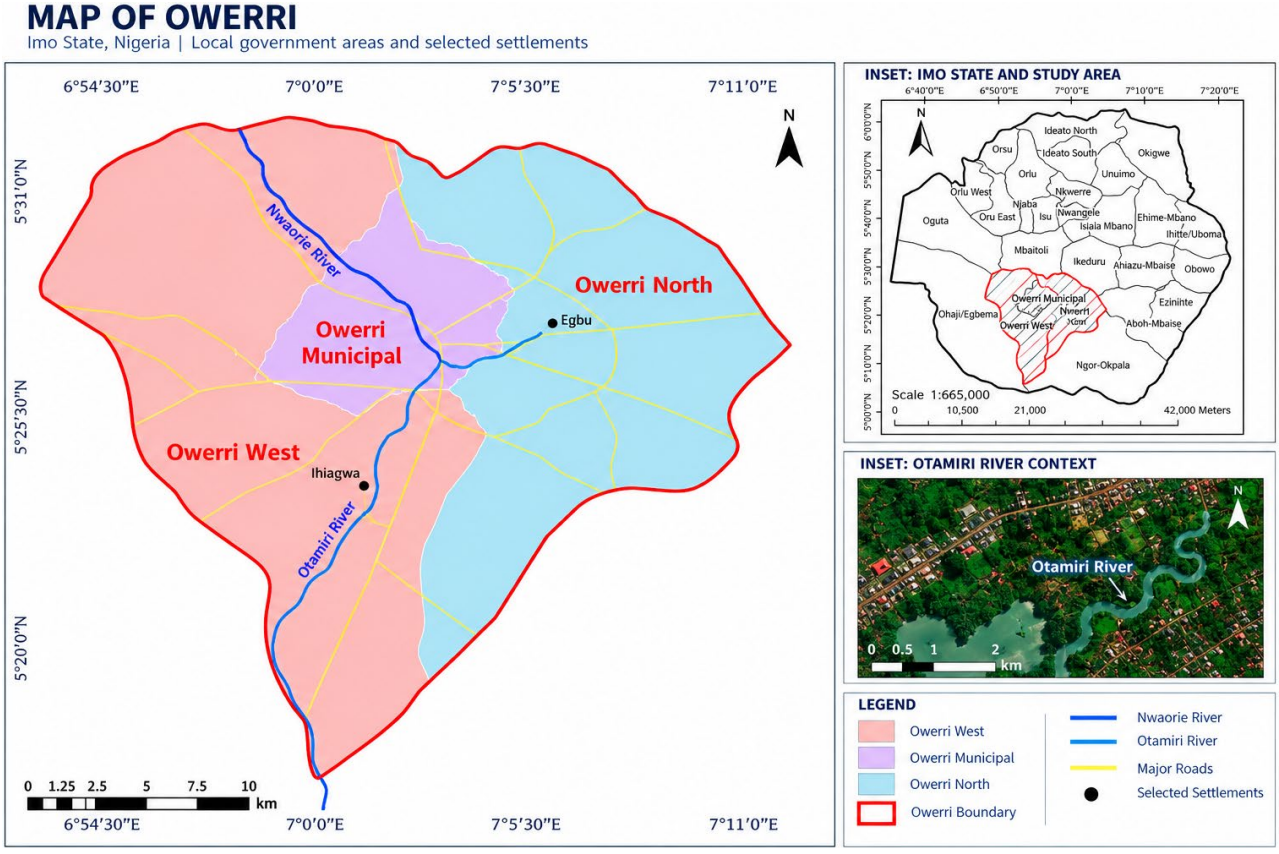
Taken together, the literature establishes strong links among environmental condition, perceived safety, crime exposure, social cohesion, guardianship and public-space use, but these relationships are commonly examined as separate or predominantly directional processes. Environmental-design studies often ask how physical interventions affect safety perceptions; criminological studies examine how crime and neighbourhood context shape risk; and recreation studies examine how safety affects visitation. Routine Activity Theory provides an important basis for integrating these relationships because it locates capable guardianship within the everyday convergence of people, places and activities, yet it gives less attention to the possibility that fear itself may alter those routines and thereby weaken guardianship. Less attention has been paid to the recursive process through which behavioural withdrawal may itself change the social conditions of a space and feed back into later perceptions of danger. The present study addresses this conceptual gap by treating the Otamiri riverfront as a socio-spatial system in which environmental neglect and narratives of insecurity may generate fear, fear may produce spatial and temporal avoidance, and avoidance may weaken legitimate presence and informal guardianship, thereby reinforcing the conditions through which the riverfront is experienced as unsafe. This synthesis does not assume that avoidance causes crime in a simple linear sense. Rather, it provides a framework for investigating how perception and behaviour can participate in the continuing social production of unsafe space, offering a context-sensitive basis for interpreting the qualitative evidence from Otamiri River, Owerri.

3. Methodology

The study was conducted along the Otamiri River corridor in Owerri, Imo State, southeastern Nigeria. The study investigated an environment that does not constitute a formally planned and institutionally managed public space. This distinction is methodologically important because the research examines everyday inter-

action with an informal and relatively weakly managed riverine environment rather than the performance of a conventional recreational facility.

The corridor was selected as an information-rich case because it concentrates several socio-spatial conditions relevant to the fear-avoidance process. The study identifies overgrown vegetation, poor infrastructure, limited lighting and visibility, inadequate surveillance and deficiencies in public amenities as prominent characteristics of the riverfront. These conditions provide an appropriate setting for examining how environmental cues become associated with insecurity and how such perceptions influence when, where and how people use the riverfront. Case selection was therefore analytical rather than statistically representative. Consistent with Creswell and Creswell [20], the objective was to obtain contextual depth and explanatory understanding rather than to generalise statistically to all Nigerian riverfronts (See **Figure 2**).



Note: Source: Designed by the authors.

Figure 2. Location and physical context of the Otamiri River corridor, Owerri, Imo State, Nigeria. The study corridor is indicative rather than cadastral.

3.1. Philosophical Position and Research Logic

The methodological architecture was guided by the research onion of Saunders, Lewis and Thornhill [21] and the qualitative research-design principles of Creswell and Creswell [20]. These frameworks emphasise coherence among research

philosophy, approach, strategy, time horizon, data generation and analysis. An interpretivist position was adopted because fear, safety and avoidance are understood as meanings constructed through experiences, social narratives and encounters with particular environments rather than as fixed attributes of space. The central methodological concern was therefore not merely whether the Otamiri riverfront was objectively unsafe, but how users interpreted insecurity and how those interpretations shaped spatial behaviour.

The study combined inductive and abductive reasoning. Induction allowed patterns to emerge from interviews, observations and visual evidence, while abductive reasoning was employed during interpretation to examine how recurring themes could explain the relationship between environmental neglect, perceived insecurity, avoidance and declining legitimate presence. This approach is consistent with Saunders *et al.* [21], who emphasise alignment between philosophical assumptions and research approach. Importantly, the fear-avoidance feedback loop is not treated as a statistically tested causal model. Instead, it represents an explanatory synthesis derived from patterned qualitative evidence and therefore provides propositions that may be tested through subsequent comparative or quantitative research.

The methodological alignment is summarised in **Table 1**.

Table 1. Methodological architecture of the study. Source: Authors' synthesis based on Braun and Clarke [22], Creswell and Creswell [20], Korstjens and Moser [23], Malterud *et al.* [24], Nowell *et al.* [25], and Saunders *et al.* [21].

Methodological dimension	Choice	Rationale
Philosophy	Interpretivism	Captures socially constructed meanings of safety and fear
Research logic	Inductive-abductive	Connects emerging empirical patterns with explanatory interpretation
Strategy	Qualitative single-case study	Provides contextual depth within a bounded riverfront setting
Sampling/data	Purposive sampling; 20 participants; interviews, observation and visual documentation	Prioritises information-rich experiences and triangulation
Analysis/quality	Reflexive thematic analysis and trustworthiness criteria	Supports transparent movement from evidence to conceptual explanation

This methodological alignment connects the study's interpretivist philosophy, case-study strategy, purposive participant selection, triangulated evidence and reflexive analysis to the central research problem. It consequently provides a defensible basis for examining how perceived insecurity may generate avoidance and how reduced legitimate presence may subsequently contribute to the continuing social production of an unsafe riverfront.

3.2. Case-Study Strategy, Sampling and Participants

A qualitative single-case study design was adopted to investigate perceptions of

insecurity, environmental conditions and patterns of spatial behaviour along the Otamiri River corridor in Owerri, Nigeria. Participants were selected through purposive sampling, supplemented by snowball sampling, to ensure the inclusion of individuals with direct knowledge and experience of the riverfront. The eligibility criteria included being at least 18 years of age, residing in communities adjoining the riverfront or having direct experience of the area through recreational, occupational, commercial or community-related activities. Individuals without prior familiarity with the riverfront and those unwilling to provide informed consent were excluded.

Recruitment was undertaken at selected public-access points along the riverfront, adjoining pedestrian routes, nearby residential areas and commercial activity locations. Potential participants were approached individually, informed about the study objectives and invited to participate voluntarily. Snowball referrals were subsequently employed to identify additional information-rich participants, particularly individuals whose experiences of riverfront use and perceived insecurity were relevant to the research objectives. The combination of purposive and snowball sampling facilitated the inclusion of participants with varying demographic backgrounds, relationships with the riverfront and patterns of spatial engagement.

Table 2. Participant characteristics and riverfront-use profile (n = 20).

Characteristics	Category	Frequency (n)	Percentage (%)
Gender	Male	11	55.0
	Female	9	45.0
	Subtotal	**20**	**100.0**
Age (years)	18 - 29	5	25.0
	30 - 39	7	35.0
	40 - 49	5	25.0
	50 and above	3	15.0
	Subtotal	**20**	**100.0**
Primary relationship with the riverfront	Nearby residents	8	40.0
	Recreational/exercise users	6	30.0
	Livelihood/commercial users	4	20.0
	Community representatives/other	2	10.0
	Subtotal	**20**	**100.0**
Frequency of riverfront use	Daily	6	30.0
	Weekly	7	35.0
	Less frequently	5	25.0
	Former users/not currently visiting	2	10.0
	Subtotal	**20**	**100.0**

Note: Source: Authors' analysis of semi-structured interview data (2025).

A total of 20 participants were included in the study. The demographic profile presented in Table 2 comprises 11 males (55%) and nine females (45%), with ages ranging from 21 to 62 years. Participants aged 30 - 39 years constituted the largest age category (35%), followed by those aged 18 - 29 years (25%) and 40 - 49 years (25%), while participants aged 50 years and above accounted for 15% of the sample. Regarding their primary relationship with the riverfront, eight participants (40%) were residents of adjoining communities, six (30%) were recreational or exercise users, four (20%) engaged in livelihood or commercial activities, and two (10%) were community representatives or individuals with other forms of local engagement. Although participants could maintain multiple relationships with the riverfront, each was assigned to a single primary category for descriptive purposes.

Patterns of riverfront use also varied across the sample. Six participants (30%) reported daily use, seven (35%) visited weekly, and five (25%) used the area less frequently. The remaining two participants (10%) were former users who retained direct knowledge of the riverfront but no longer visited regularly. This variation in frequency and nature of engagement provided a basis for exploring differences in perceived safety, temporal avoidance and behavioural responses to environmental conditions (See Table 2).

The diversity of the participant profiles was considered relevant to the study's interpretivist orientation, as perceptions of insecurity and experiences of public space may differ according to individuals' residential proximity, livelihood dependence, recreational interests and patterns of exposure to the riverfront environment. Including participants with varying levels of engagement also provided an analytical basis for examining the relationship between perceived insecurity and spatial or temporal avoidance. Sample adequacy was assessed through the concept of information power rather than statistical representativeness. Consistent with Malterud, Siersma and Guassora [24] the relatively focused research objective, geographically bounded case-study setting and participants' experiential familiarity with the riverfront provided a basis for an intensive qualitative investigation. Accordingly, the sample was intended to support contextual understanding and analytical interpretation rather than population-level generalisation.

3.3. Data Generation and Analytical Procedure

Three complementary qualitative methods were employed to investigate the relationship between environmental conditions, perceived insecurity and patterns of public-space use along the Otamiri River corridor in Owerri, Imo State, Nigeria: semi-structured interviews, systematic non-participant field observations and visual documentation. The combination of these methods was designed to capture participants' lived experiences while examining the physical and social characteristics of the riverfront environment. The fieldwork period is recorded as 9 September-20 December 2025. Twenty semi-structured interviews were undertaken with participants drawn from communities adjoining the riverfront and individ-

uals whose recreational, commercial, occupational or other activities brought them into contact with the study area. Interviews were conducted at mutually convenient locations within or near the riverfront corridor, including quiet areas adjoining pedestrian access routes, residential premises and nearby commercial activity locations. Interview settings were selected to minimise interruptions, encourage open discussion and maintain participant confidentiality.

Interviews were conducted in English, Igbo or Nigerian Pidgin, depending on participants' language preferences and communicative competence. This flexibility was intended to accommodate the linguistic characteristics of the study population and facilitate detailed accounts of personal experiences, environmental perceptions and everyday spatial practices. Each interview lasted approximately 30 - 50 minutes, with an average duration of 40 minutes. A semi-structured interview guide organised discussions around six principal issues: participants' relationships with the riverfront; perceptions of personal safety; experiences of victimisation and community narratives concerning crime; environmental characteristics associated with vulnerability; patterns of spatial and temporal avoidance; and perceived adequacy of formal and informal surveillance. Follow-up questions were used to clarify participants' experiences and explore differences in safety perceptions across locations and periods of the day.

With participants' informed consent, interviews were digitally audio-recorded and supplemented by contemporaneous field notes. Interview recordings were transcribed verbatim, retaining participants' substantive expressions and accounts of place-specific experiences. Interviews conducted in Igbo or Nigerian Pidgin were translated into English by bilingual members of the research team. Translations were checked against the original recordings to minimise potential loss of meaning, particularly in references to insecurity, victimisation, environmental characteristics and culturally specific descriptions of the riverfront. All transcripts were anonymised using participant identification codes R0001-R0020.

Systematic non-participant observations were designed to complement interview accounts by documenting environmental characteristics, surveillance conditions and patterns of legitimate human activity across the Otamiri River corridor. The observational framework divided the study corridor into four spatial units based on their dominant physical and functional characteristics:

- Zone A—Principal riverfront access points: pedestrian entrances and connecting access routes providing entry to the riverfront.
- Zone B—Main pedestrian and recreational pathways: accessible routes used for walking, exercise and everyday movement.
- Zone C—Vegetated riverbank sections: relatively secluded stretches characterised by natural vegetation, restricted sightlines and comparatively limited public activity.
- Zone D—Residential and livelihood interface: sections adjoining residential properties and locations associated with small-scale commercial, occupational and river-dependent activities.

Six structured observation visits were scheduled across these zones during the fieldwork period. Visits were distributed across weekdays and weekends and across morning, midday and late-afternoon periods to capture temporal variation in human presence and environmental conditions. Each observation visit lasted approximately 90 minutes, giving a combined observational duration of nine hours (See Table 3).

Table 3. Schedule and spatial coverage of field observations.

Visit	Date	Observation time	Duration	Areas covered
1	10 September 2025	7:30 a.m. - 9:00 a.m.	90 minutes	Zone A
2	22 September 2025	10:30 a.m. - 12:00 p.m.	90 minutes	Zones A and B
3	14 October 2025	3:30 p.m. - 5:00 p.m.	90 minutes	Zone B
4	17 November 2025	8:00 a.m. - 9:30 a.m.	90 minutes	Zone C
5	10 December 2025	12:00 p.m. - 1:30 p.m.	90 minutes	Zones C and D
6	20 December 2025	4:00 p.m.- 5:30 p.m.	90 minutes	Zone D
Total			**540 minutes (9 hours)**	

During each visit, approximately 15 minutes were allocated to stationary observation within each spatial unit, with the remaining period devoted to movement between locations and the documentation of environmental characteristics. The same spatial categories were revisited across observation periods to facilitate comparisons between locations and times of day. Observations were predominantly undertaken during daylight hours. Consequently, nighttime conditions and activities were assessed through participants' reported experiences rather than direct nocturnal observation.

A structured observation framework was developed around four principal dimensions: visibility, environmental maintenance, formal surveillance and human presence. On Visibility, assessment focused on the continuity of pedestrian sightlines, visual connectivity between adjoining spaces, vegetation-related obstruction, potential concealment points and the extent to which pathways and access points could be observed from surrounding activity areas. Visibility was classified descriptively as clear, partially obstructed or substantially obstructed, reflecting the degree to which vegetation, structures or spatial configuration restricted visual access. On Environmental maintenance, the indicators included vegetation overgrowth, accumulated litter, damaged pedestrian surfaces, deteriorating public infrastructure, drainage conditions and the general condition of recreational or pedestrian amenities. Each observation sought to distinguish environmental deterioration from natural landscape characteristics, recognising that vegetation and other ecological features are not inherently indicators of insecurity. On Formal surveillance, the observations focused on visible security personnel, patrol activity, surveillance installations, security-related signage and the presence and condition of lighting infrastructure. Because most observations occurred during day-

light hours, the presence of lighting installations was documented without assuming their nighttime functionality. The absence of security personnel during a particular observation period was not interpreted as evidence that formal security services were permanently unavailable. Finally on Human presence the observations documented the approximate number of individuals present, their spatial distribution and the activities undertaken. Particular attention was given to pedestrians, recreational users, nearby residents, vendors and individuals engaged in river-related occupational activities. Human activity was examined in relation to observation time, the accessibility of different locations and opportunities for visual interaction between users.

For analytical purposes, legitimate presence was defined as the occupation and use of the riverfront by individuals engaged in ordinary social, recreational, residential, pedestrian, occupational or commercial activities. It was identified through interview accounts describing the timing, frequency and purpose of visits, as well as observed patterns of everyday activity across the different spatial units. Informal guardianship was conceptualised as the potential for passive observation, social recognition and informal oversight arising from ordinary human presence. Interview indicators included participants' perceptions of safety when other people were nearby, references to familiar users and community members, opportunities to seek assistance, and accounts of reduced activity or social interaction. Observational indicators included visual connectivity between users, the presence of routine activities, proximity between occupied locations and the potential for users to observe surrounding pathways and riverfront spaces. A distinction was maintained between legitimate presence and effective guardianship. The presence of ordinary users was treated as a potential contributor to natural surveillance rather than direct evidence of protective intervention or reduced offending. This distinction was particularly important because the study did not directly measure crime-prevention behaviour or independently verify criminal incidents.

The three evidence streams were examined comparatively through methodological triangulation. Interview accounts identifying poor visibility, overgrown vegetation, limited surveillance and perceived isolation were compared with field observations and available photographic documentation. Similarly, participants' descriptions of temporal and spatial avoidance were interpreted alongside observed patterns of human presence and activity. The analytical process distinguished among three categories of evidence: experiences and perceptions reported by participants, environmental and social conditions directly documented through field observation, and explanatory relationships developed through researcher interpretation. In particular, the relationship between fear-driven withdrawal and declining informal guardianship was treated as a qualitative explanatory proposition rather than a directly measured causal relationship.

This approach strengthened the contextual interpretation of the findings while acknowledging the limitations of a cross-sectional design and predominantly day-

time observations. It also helped prevent unverified narratives of criminal activity or perceived opportunities for offending from being represented as independently established crime conditions. Triangulation therefore strengthened the credibility of the thematic findings while recognising that observations conducted predominantly during daylight hours could not independently verify participants' accounts of nighttime insecurity [25].

Analysis followed reflexive thematic analysis informed by Braun and Clarke [22]. The process involved familiarisation with interview and observational material, initial coding, development and review of candidate themes and subsequent interpretive synthesis. Initial codes remained close to participants' accounts, including *avoiding the riverfront after dark*, *poor visibility*, *absence of other users* and *environmental neglect*. These were subsequently organised into higher-order themes including environmental crime cues, perceived insecurity, spatial and temporal avoidance, reduced legitimate presence, weakened informal guardianship and reinforced unsafe reputation. Initial coding was undertaken by the first author, who systematically examined the interview transcripts, field-observation notes and photographic records to identify recurring patterns relating to temporalised fear; environmental neglect and perceived opportunity; formal and informal guardianship deficits; spatial and social withdrawal; and the reputational reproduction of insecurity. Coding proceeded iteratively, beginning with descriptive codes closely reflecting participants' accounts before progressing towards broader interpretive categories informed by Routine Activity Theory.

The initial codes and candidate themes were subsequently reviewed by all three authors. This process involved repeated engagement with the original material, critical discussion of emerging interpretations, examination of overlapping codes and consideration of accounts that diverged from dominant patterns. Candidate themes were refined by assessing their internal coherence, conceptual distinctiveness and relevance to the study objectives. Differences in interpretation were addressed through reflexive discussion and renewed examination of the source material rather than through statistical measures of intercoder agreement, consistent with the interpretive orientation of reflexive thematic analysis.

Analytical transparency was supported through the preparation of reflexive memos and an evidence-integration matrix linking interview accounts, field observations and photographic documentation to the developing themes. The memos documented decisions concerning code refinement, theme development, alternative interpretations and the conceptual relationships identified during analysis. The evidence matrix distinguished participant-reported experiences from directly observed environmental and social conditions and subsequent researcher interpretations. This distinction was particularly important in examining the fear-avoidance-guardianship feedback mechanism. Whereas interview accounts provided evidence of perceived insecurity and self-reported behavioural withdrawal, field observations documented environmental conditions and patterns of human presence within the observation periods. The proposition that fear-driven with-

drawal may progressively weaken informal guardianship was therefore developed through interpretive synthesis rather than treated as a directly observed or statistically established causal relationship.

Throughout the analytical process, attention was given to the limitations of the cross-sectional design, particularly the predominantly daytime observations and the absence of independently verified crime-event data. Participants' personal accounts of victimisation, community narratives concerning criminal activity and perceptions of crime opportunity were consequently maintained as analytically distinct forms of evidence. This approach supported a transparent progression from empirical material to thematic interpretation while ensuring that the feedback mechanism remained appropriately framed as a context-specific qualitative explanatory proposition.

The fear-avoidance framework was therefore not imposed as a predetermined coding structure. Rather, it emerged from examining relationships among recurring themes. This distinction separates participant testimony, observed environmental conditions and researcher interpretation. One limitation is that direct observations occurred predominantly during daylight hours, although participants frequently associated heightened insecurity with evening and nighttime periods. Claims concerning nighttime avoidance consequently rely principally on participant narratives rather than equivalent nocturnal observation.

3.4. Trustworthiness, Reflexivity and Ethics

Qualitative rigour was considered through credibility, transferability, dependability and confirmability, following established trustworthiness principles [25]. Credibility was strengthened through triangulation between interview, observational and visual evidence. Dependability was supported by maintaining a transparent analytical progression from raw accounts to codes, themes and interpretation. Confirmability was addressed by distinguishing what participants reported from what was directly observed and from subsequent researcher interpretation. Transferability was facilitated by providing sufficient contextual description of the Otamiri riverfront for readers to judge the relevance of the findings to comparable environments. Reflexivity was particularly important because the study concerns perceived crime. Participants' statements about criminal activity were therefore treated as perceptions, experiences or community narratives unless independently corroborated; environmental deterioration was similarly interpreted as a perceived cue of insecurity rather than direct evidence of crime. The study also recognises possible social-desirability effects and difficulties arising from translating some interviews conducted in local languages or Nigerian Pidgin into English. Participation was voluntary, informed consent was obtained, and anonymity and confidentiality were maintained. These safeguards were important given the sensitivity of discussing crime, victimisation and potentially unsafe locations. It is important to acknowledge that some participants may have withheld information because of concerns about personal security or fear of reprisal.

Ethical approval for the study was granted by the Faculty of Environmental Sciences Research Ethics Committee, Imo State University, Owerri, Nigeria with approval date: 21st June 2025 and reference number FES00345RE. The study was conducted in accordance with established ethical principles governing research involving human participants. Prior to data collection, participants were informed of the study objectives, the voluntary nature of participation, their right to withdraw and the measures adopted to protect their privacy. Informed consent was obtained from all participants, and confidentiality was maintained throughout the research process. Interview records were anonymised using unique participant identification codes (R0001-R0020). Given the sensitivity of discussions concerning crime, victimisation and perceived insecurity, particular attention was paid to protecting participants' identities and ensuring that reported experiences could not be attributed to identifiable individuals.

4. Discussion

This discussion interprets the findings from the 20 semi-structured interviews using Theme, Evidence, Interpretation and Connection. For transparency and anonymity, the interviews are assigned manuscript identifiers R0001-R0020. Where participants are quoted, the identifier is accompanied by the participant description available in the dataset. The discussion is organised around five themes generated from this empirical research: temporalised fear; environmental neglect and perceived opportunity; formal and informal guardianship deficits; spatial and social withdrawal; and the reputational reproduction of insecurity. These themes are interpreted principally through Routine Activity Theory (RAT), which understands crime opportunity through the convergence of motivated offenders, suitable targets and the absence of capable guardianship [9]. RAT is explicitly identified in the study as one of the theories through which the relationship between crime opportunity, users and weak guardianship is understood. The discussion, however, shows that the Otamiri findings extend this conventional formulation by demonstrating that fear and avoidance can themselves modify routine activities and progressively weaken the guardianship on which safer public-space use depends.

Evidence classification is maintained throughout the findings: "reported victimisation" identifies an interviewee's first-person account of an incident, not an independently verified offence; "community narrative" identifies second-hand accounts circulated by others; and "perceived crime opportunity" refers to an interviewee's interpretation of concealment, isolation or weak oversight, not an observed criminal act. No police crime records or independent incident verification are reported in this study.

4.1. Temporalised Fear and the Restructuring of Routine Activity

The first theme is that insecurity along the Otamiri riverfront is temporally differentiated rather than uniformly experienced. Participants consistently associ-

ated daylight and the presence of other legitimate users with greater safety, while evening periods were associated with fear and withdrawal. R0001, a female resident in her mid-30s, explained: *"I only come to the riverside in the morning when there are more people around. After midday, you start seeing fewer people, and it starts to feel unsafe."* Similarly, R0010, a male regular exercise user in his early 30s, observed: *"If you come in the late morning or afternoon, it feels safer because there are more people around. But as soon as it gets dark, the place looks deserted."*

The evidence indicates that perceived safety depends partly on the social occupation of space. The physical riverfront may remain substantially the same across the day, yet users interpret it differently when the number of people present declines. This is consistent with Odufuwa *et al.* [2], who found that perceived insecurity at Nigerian recreational sites was associated with avoidance of particular locations and periods, and with the broader literature showing that fear can reorganise when and how public space is used. The findings therefore position fear not merely as a psychological response to crime but as an influence on everyday mobility.

A first-person account of an alleged attempted theft illustrates the association between reported victimisation and behavioural change. R0002, a young male jogger and regular riverfront user, recalled: *"Two weeks ago, someone tried to snatch my phone when I was jogging in the evening. Since then, I don't come here after 5 p.m."* In RAT terms, the participant reduces exposure by changing his routine. Yet when many users make similar adjustments, the collective consequence is fewer legitimate users during particular periods. This account is not independent verification of a crime incident but suggests a potential mechanism not fully captured by a static reading of RAT: fear changes routine activities, and those altered routines can reduce the informal guardians available in the setting. This can be conceptualised as temporal guardianship depletion.

4.2. Environmental Neglect, Visibility and Perceived Crime Opportunity

The second theme concerns the way environmental deterioration is interpreted as a cue of vulnerability and perceived crime opportunity. Participants did not simply describe broken infrastructure as aesthetically undesirable; they connected environmental conditions directly to visibility, concealment and their capacity to anticipate danger. R0006, a resident living near the riverfront, stated: *"The riverside used to be better maintained; the trees have grown so tall that some areas are completely dark. It's easy for thieves to hide."* Likewise, R0009, a male university student who uses the riverfront for studying, explained: *"The area near the river is the worst. It's secluded, and there are lots of bushes… I only stay on the main pathways now."*

These accounts support the environmental-safety literature reviewed earlier. Piroozfar *et al.* [12] emphasise lighting, visibility, access control, territorial defi-

nition and maintenance within CPTED, while Navarrete-Hernandez, Vetro and Concha [13] demonstrate that improved visibility and reduced threatening environmental cues can strengthen perceptions of safety. Navarrete-Hernandez and Afarin [14] similarly caution that natural features are not inherently threatening; their safety implications depend on how vegetation, visibility and legibility interact.

The Otamiri evidence therefore does not suggest that vegetation itself causes crime. Instead, environmental neglect acquires meaning through users' perceptions of concealment, surveillance, escape and institutional care. From a RAT perspective, physical conditions may affect perceived opportunities for interaction among possible offenders, targets and guardians; no offender presence was independently established here. The present findings extend this by showing that environmental cues also act before an encounter occurs: they influence whether potential users enter particular parts of the riverfront, how long they stay and which routes they choose. Environmental neglect may therefore influence perceived opportunity through spatial design and through the behavioural responses users describe.

4.3. Formal and Informal Guardianship Deficits

The third theme concerns a perceived shortage of both formal and informal guardianship. Participants connected insecurity with inconsistent policing, absence of security infrastructure and limited collective responsibility. R0004, a local shop owner near the riverfront, observed: *"The police are not always around, and the place is usually deserted after dark."* R0005, a female riverfront user in her late 20s, similarly stated: *"I've never seen any police patrolling this area, not even security guards. There are no cameras or anything to make you feel safe."* The weakness of guardianship was not attributed solely to formal institutions. R0007, a community leader, explained: *"People in this area don't really work together to make the riverside safer. Everyone is more focused on their own security at home."* These participant accounts portray guardianship as a multi-layered phenomenon involving formal security personnel, community responsibility and the passive surveillance produced by ordinary users.

This interpretation corresponds with Boessen and Hipp [10], who demonstrate that park crime is strongly influenced by surrounding neighbourhood conditions, and Taylor, Haberman and Groff [11], who show that park characteristics interact with socioeconomic context and social cohesion. The literature further indicates that regular users, residents and organised activities can themselves constitute a safety resource because they increase observation and opportunities for informal intervention. Clarke *et al.* [17] similarly identify safety, maintenance and opportunities for social interaction as important to cohesive urban greenspaces.

The theoretical implication is that capable guardianship should not be regarded simply as a fixed variable that is either present or absent. At Otamiri,

guardianship appears socially produced and potentially self-eroding. Where formal security is perceived as inadequate, the presence of ordinary users becomes especially important. Yet fear causes those users to withdraw. This suggests a potentially reinforcing relationship: weak guardianship increases perceived vulnerability, while perceived vulnerability induces behaviours that further weaken guardianship.

4.4. Spatial Avoidance and the Erosion of Legitimate Public-Space Use

A fourth theme is the spatial contraction and functional transformation of riverfront use. Participants did not necessarily cease using the area entirely; instead, many restricted their movements to particular routes, times and activities. R0014, a young male riverfront user, explained: *"I stick to the main paths and stay close to the entrance. The farther you go toward approaching the river, the more dangerous it feels."* The quotation demonstrates a micro-spatial response to fear: legitimate activity becomes concentrated in visible, populated areas while other sections are described as receiving less use; a corridor-wide decline was not measured.

The temporal effects were equally pronounced. R0013, a lumber instructor and riverside user, stated: *"I used to work with my boys on dredging and sorting of woods here in the evenings, but people stopped coming because of safety concerns. Now, I only take on these activities from around 9am to 2pm as a result of security concerns"* This finding aligns closely with Odufuwa *et al.* [2], who identify spatial and temporal contraction in response to perceived insecurity, and with Zhang *et al.* [16], whose longitudinal evidence indicates that crime exposure can suppress park visitation beyond the immediate occurrence of an incident.

Importantly, the consequences extend beyond individual risk avoidance to the social functionality of the riverfront. R0015, a community organiser, recalled: *"We used to have gatherings here, especially on weekends, but fewer people want to take part because they're worried about safety."* Reported reductions in group exercise, informal recreation and community gatherings may diminish forms of legitimate activity that could generate surveillance, interaction and territorial familiarity.

This finding extends RAT by showing that the distribution of guardianship is not independent of public-space use. When legitimate activities are displaced to mornings, entrances and main paths, other times and locations may become more socially vacant. The resulting pattern can be conceptualised as a spatial guardianship deficit: avoidance does not merely protect users from perceived exposure; collectively, it may redistribute opportunities for informal guardianship away from the places interpreted as most threatening.

4.5. Place Reputation and the Fear-Avoidance Feedback Loop

The fifth theme concerns the social circulation of unsafe reputation. Participants

described fear in relation both to first-person experiences and to unverified stories and accumulated community narratives about the riverfront. R0008, a female resident in her 40s who visits with her children, explained: *"I don't feel safe here. I always keep an eye on my kids because I've heard stories of people being attacked."* R0001 similarly referred to having *"heard of people getting robbed"* near the riverbank. These second-hand narratives may inform perceived insecurity even without first-person victimisation; the alleged incidents were not independently verified.

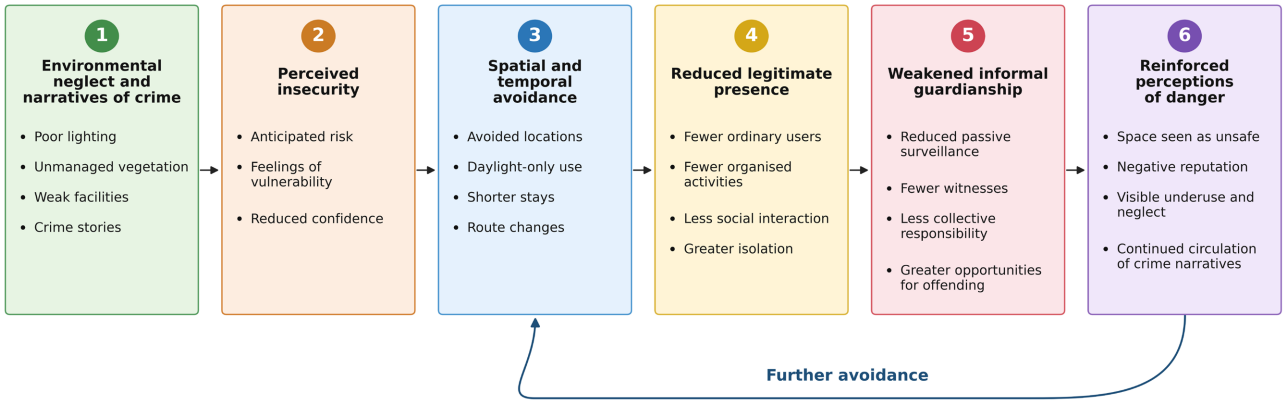
This finding corresponds closely with Sisson's [18] conceptualisation of territorial stigmatisation, in which material, institutional and symbolic processes combine to attach negative meanings to places. Repeated narratives of crime, disorder or abandonment can establish a durable reputation for danger even among people with limited direct experience. Jeong and Gim [19] likewise connect territorial stigma with neighbourhood crime, suggesting that symbolic constructions of place and material insecurity can become mutually reinforcing.

The Otamiri findings therefore suggest that unsafe reputation becomes part of a recursive socio-spatial process. As a qualitative explanatory proposition, circulating narratives may generate anticipatory fear; reported fear is linked in participants' accounts with avoidance; and the suggested effects on aggregate presence, informal surveillance and later reputation are interpretive rather than directly observed causal steps. The literature review anticipated precisely this possibility, noting that avoidance may reduce informal guardianship and make isolation and threatening cues more salient to subsequent users.

Evidence status of the feedback sequence: interview accounts support associations between environmental cues or crime-related stories and fear, and between fear and self-reported changes in visitation, routes or activities (R0001, R0002, R0008, R0009, R0010, R0013-R0015). Predominantly daylight field observations and visual documentation support descriptions of physical conditions and contemporaneous human presence, but do not establish a before-and-after decline or independently verify nighttime behaviour. The links from multiple individual avoidance decisions to corridor-wide reductions in legitimate presence, then to weakened informal guardianship and renewed fear, are researcher interpretations informed by Routine Activity Theory. The complete feedback loop is therefore a qualitative explanatory proposition, not a temporally observed or causally tested mechanism.

4.6. Contribution to Routine Activity Theory

Taken together, the five themes provide a theoretically grounded extension of Routine Activity Theory. The conventional RAT formulation explains crime opportunity through the convergence of a motivated offender, a suitable target and insufficient capable guardianship. The Otamiri evidence supports the importance of guardianship but suggests that reductions in guardianship may partly follow from fear-driven behavioural change (See **Figure 3**).



Note: The mechanism represents a recursive socio-spatial process. Reinforced perceptions of danger feed back into spatial and temporal avoidance ("further avoidance"), which can reduce legitimate presence and weaken informal guardianship. It does not imply that avoidance directly causes crime.

Source: Authors' synthesis from the study findings; theoretical interpretation grounded in Routine Activity Theory.

Figure 3. Fear-Avoidance-Guardianship Feedback Mechanism at the Otamiri Riverfront.

This does not imply that avoidance directly causes crime, nor that every empty space inevitably becomes criminal. Rather, it identifies a mechanism through which fear can alter routine activities and consequently change the social conditions under which opportunities and perceptions of risk develop. In this respect, the study moves RAT beyond treating guardianship principally as an antecedent condition and conceptualises it as a dynamic, behaviourally contingent and potentially self-eroding resource. The empirical contribution is equally important. Much of the existing safety literature is derived from formally planned parks in Europe, North America and East Asia, whereas the Otamiri case concerns an informally used, weakly managed riverfront in a Nigerian city. The existing review identifies this contextual imbalance and the need for greater evidence from developing-country settings. The findings suggest that, in such environments, perceptions of unsafe space may emerge through interactions among physical neglect, crime-related accounts, perceived weak security, fear and reported patterns of occupation and withdrawal. The study therefore contributes to theory by showing how fear can become an active component of the routine-activity process itself, linking perception, behaviour, guardianship and the continuing social production of unsafe riverfront space.

5. Conclusions

This study examined how fear, environmental conditions and changing patterns of public-space use interact in the social production of unsafe riverfront space along the Otamiri River in Owerri. Rather than treating insecurity simply as an outcome of recorded crime, the study approached the riverfront as a socio-spatial environment in which perceptions of danger are shaped by environmental cues, personal and shared experiences, social narratives and the presence or absence of other legitimate users. Drawing on evidence from 20 qualitative interviews, field observations and visual documentation, participants' accounts suggest that per-

ceived insecurity varies across the riverfront. It varies spatially and temporally, with poorly lit, overgrown and isolated locations, particularly during evening periods, attracting stronger perceptions of vulnerability. These perceptions subsequently influence when users visit, the routes they take, the duration of their stay and the kinds of activities they are willing to undertake.

Five interrelated themes explain this process: temporalised fear, environmental neglect and perceived crime opportunity, deficiencies in formal and informal guardianship, spatial withdrawal from legitimate public-space use, and the reputational reproduction of insecurity. Taken together, these findings show that fear does more than discourage individual use. Participants described restricting their movements, abandoning evening activities and concentrating on more visible routes. Collectively, such adjustments may diminish legitimate presence; the proposition is that fewer ordinary users would reduce opportunities for passive observation, social interaction and informal surveillance, while making neglected or isolated sections appear more threatening. Community narratives of crime further amplify this process by allowing perceptions of insecurity to circulate beyond those who have directly experienced victimisation.

The principal theoretical contribution of the study lies in its extension of Routine Activity Theory. While the theory conventionally treats capable guardianship as an antecedent condition influencing opportunities for crime, the Otamiri findings indicate that guardianship may itself be shaped by fear-driven changes in routine activity. The study therefore proposes a qualitative fear-avoidance-guardianship feedback mechanism in which environmental neglect and narratives of crime contribute to perceived insecurity; insecurity encourages spatial and temporal avoidance; avoidance reduces legitimate presence; reduced presence weakens informal guardianship; and weakened guardianship reinforces perceptions of danger and further avoidance. This does not suggest that avoidance directly causes crime. Rather, it suggests that fear may modify the social conditions through which public-space safety and guardianship are produced. Guardianship is consequently better understood as dynamic, socially produced and potentially self-eroding rather than as a fixed condition.

These findings also have important implications for urban planning and riverfront management. Improving safety along the Otamiri corridor requires more than isolated policing or security installations. Interventions should combine appropriate lighting, vegetation management, improved visibility and maintenance with measures that deliberately restore legitimate everyday activity. Recreational programming, community-based stewardship, active frontages and regular social activities can help repopulate underused areas and strengthen informal guardianship. The objective should therefore be to interrupt the feedback mechanism by making the riverfront both visibly cared for and socially occupied.

The study nevertheless has limitations. Its cross-sectional qualitative design does not permit causal testing of the feedback mechanism; observations were conducted predominantly during daylight hours, and the fieldwork did not include

policymakers or law-enforcement personnel. Future research should test the mechanism longitudinally, incorporate nighttime observations and crime-event data, and compare multiple riverfronts across Nigerian and other African cities. Such work would help determine the conditions under which fear-driven withdrawal translates into declining guardianship and whether targeted planning interventions can reverse the process.

Conflicts of Interest

The authors declare no conflicts of interest.

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