

Analysis of Urban Recreational Park Use as an Index to Social Resilience, Urban Management and Climatic Adaptation

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ABSTRACT

Globally, urban green space as a biophysical climate adaptation and resilience planning tool is being used by urban communities. This paper considers the social dimension of urban green space (public parks). The analytical method was designed to be spatially explicit, and replicable; environmental resource managers engaged in recreational park management and resilience planning could apply this method in citywide public parks. The researchers developed a mixed-method approach for the examination of the uses and social imperatives of urban public space and pilot this method in 2 acres of urban public space in waterfront neighborhoods surrounding 'Eziama and Ngwa Road, in Aba Urban area, Abia State Nigeria. This method combines field observation and in-depth interview of park users. The study found that urban public park spaces are an integral component of urban space and provide space for recreation, socialization, and environmental engagement and place attachment and social ties. The study revealed that parks through its use produce a vital traditional ecological service which strengthens social resilience. The study also found out that public park management did not integrate urban ecosystem into planning. Hence there is a need to integrate urban ecosystem and public park management into planning.

Keywords: Social resilience, urban management, green infrastructure, climatic adaptation, park management, resilience planning, ecosystem service

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INTRODUCTION

Municipalities across the world are engaged in issues relating to climate adaptation, resilience planning, and green infrastructure investment, towards improving settlement sustainability and quality of life for urban dwellers (Dale et al., 2014). In an era of climate change, urban parks are increasingly viewed by urban policy makers and land managers as natural buffers to help mitigate the effects of storms upsurge rise in sea level, and combined sewer overflow (Adger et al., 2016). While these biophysical capacities are crucial, this study considered urban public space from the definition of Beebe (2017), Boland and Hammer (2015) and Blackstock et al. (2017) as a space for cultivating social

resilience through civic engagement, active use, and stewardship activities.

Urban residents use public parks and green spaces as sites for exercise from stress, and for socialization, with clear implications for public health and well-being (Beebe, 2017; Harrison and Limb, 2017). Within the context of resilience planning, parks and other urban space can be fertile ground for fostering the type of social cohesion that is essential for strengthening resilient cities (Chan et al., 2014), particularly in the aftermath of acute and chronic psychological disturbance (Folke et al., 2016). A better understanding of urban ecosystem services requires that public parks

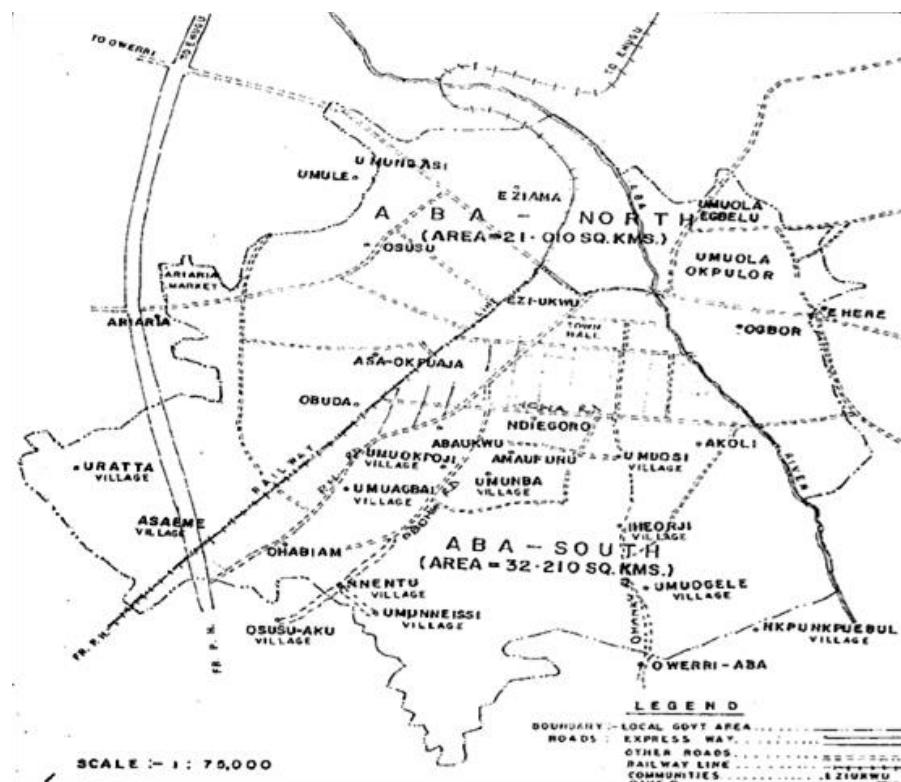


Figure 1. Map of Aba North and Aba South Local Government Areas Abia State, Nigeria. **Sources:** Department of Survey, Ministry of Lands and Survey, Umuahia (2006); updated by CAP Consults, Aba (2017).

in cities undergo dynamic changes to meet sustainability and resilience goals in urban policy and planning (Barnstorm et al., 2016).

In urban settings, ecosystem service valuation tools have been used to inform sustainability goal-setting (Byrne and Wolch, 2014), and the ecosystem service framework is prevalent among both non-profit groups and public managers of green infrastructure as it provides a means for quantifying co-benefits (Campbell and Lindsay, 2014).

Better coordination and shared information are needed to support multi-scalar planning and decision-making, from site-specific management to planning for neighborhood districts, to citywide on long-term planning basis. This study was designed in partnership with The Open Space Development Commission (OSDC), Umuahia, the municipal agency in charge of public recreational parks with its multifaceted outreach units and catchment zones in the various cities and sites in Abia State, especially, Aba Urban (Figure 1). More significantly, analysis of public recreational park use is considered more desirable in the advent of the mass encroachment of built-up areas to public recreational spaces, thus dwindling recreational services and park-like ventures, besides resulting in deteriorating health and environmental malady.

Recent decades have seen the development of the ecosystem services via public park concept into a robust framework, linked with human well-being (Bradshaw and Stratford 2015; Chan et al., 2015; Boland and Hammer, 2015). This framework recognizes humans' dependence upon ecosystems for their well-being, through the production of ecosystem services (public parks). Ecosystem services and public parks literature have typically focused at a global scale or on more rural environments, however, consideration of urban ecosystem services and public parks is also needed (Bolton et al., 2016).

In a largely urbanized world, cities are location of opportunities, interaction and social bonding (Bethel et al., 2017). Furthermore, ecosystem services as defined by Fagaholm et al. (2016) means non-material benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation and aesthetic experience. Public parks, according to Boland and Hammer (2015) contribute significantly to man's wellbeing through direct human involvement in facilitating ecosystem operations. Sequel to these definitions, therefore, it is obvious that few researches have explicitly tackled the challenge of accounting for public parks in ecosystem services and public parks assessments. Often, when they are

included, it is only those that are more easily measured (Beebe, 2017).

Urban green areas contain social and symbolic meaning, providing people public parks to a sensory and natural world and a 'good city' where people can share their experiences on the recreation ability of public parks (Blackstock et al., 2017). Byrne and Wolch (2014) examined patterns of meaning in neighborhood parks for different user groups. As anticipated by Gomez- Harrison and Limb (2017) and Cambell and Lindsay (2014), she found that the use and perception of space vary dramatically for different user groups. There was no one single experience or meaning of park space.

In developing the protocol to assess the social meaning of urban public space, the study drew from various literature (Behtel et al., 2017; Chan and Tomball, 2017), along with rural sociology (Adger et al., 2016), while adaptive methods and concepts of urban environment and open space and park-use development were as well engaged (Smith et al., 2017). The study built upon methods of rural appraisal because these tools were designed to understand the relationships between humans and the environment (Anderson et al., 2015); they offer a useful starting point for developing in situ, observational studies of the use and social meaning of urban public space. Yet, social assessments are not currently well-integrated with resilience frameworks (Chan et al., 2014).

To date, resilience thinking about social-ecological systems like urban areas has been primarily influenced by ecological principles, but integrating the concepts of public parks and human well-being into social-ecological resilience theory points to the important role of social dynamics in ecosystem function (Dale et al., 2014). Efforts to define and examine the social aspects of resilience within the context of social science theory have become more prominent in the literature (Beebe, 2017; Campbell and Lindsay, 2014; Dale et al., 2014). As an example, Harrison and Limb (2017) proposed an integrative approach for linking resilience from a systems science perspective with human resilience developed in developmental psychology and mental health (Smith et al., 2017).

The objectives of this study, therefore, include identifying urban recreational parks, to determine urban recreational park need, and to ascertain the need to integrate public parks into urban ecosystem services.

METHODOLOGY

The Public Recreational Parks Organisation (PRPO) – an NGO and the Open Space Development Commission (OSPC) are working together in a hybrid governance arrangement along with federal researchers from Umudike Research Institute, Umudike, Umuahia to conduct a baseline ecological

and social assessment of urban public spaces towards effective park planning, conservation priority setting, and programmatic development. This study represents year one of the two-year of systematic social assessment of the use of the urban recreational park to encourage resilience planning, urban management and climate adaptation.

The study selected the Aba Urban because it has recently become a focus of resilience planning efforts in Abia State. Such resilience planning efforts like purpose clause, revitalization of urban public open spaces, and functionality and livability of urban recreational parks. The Aba Urban landscape includes Aba River (waterside), grasslands, coastal woodlands, shrublands, and freshwater wetlands (Blackstock et al., 2017). The study excludes: sites closed or inaccessible public parks by foot or vehicle; parks managed by Abia State Park Service, as these have a different governance structure; and community gardens, a community memorial park, and public swimming areas, where use patterns are better captured with other protocols.

The first phase of the project consisted of a gathering of data, through the interview of park employees and community informants. Likewise, field observation and ground-truthing of the parks was carried out to create zones within parks towards the collection of spatially explicit data. The first phase also entails enhancing the rigor of this method, where the study pre-tested and received feedback on protocols from the urban recreational park and open space managers. Data collection occurred throughout the rainy season from June–September 2017; every park was visited thrice a week during the morning (8-10am), afternoon (12-2pm), and evening (4-6pm). According to Beebe (2017), there are three basic techniques or approaches to study, which are direct observations, indirect observation and interview. Therefore, the study qualitatively triangulated three data collection approaches, direct observations of human activities, observation of signs of human use, and interviews with park users, to maximize the validity and reliability of the data collected.

The study grouped human activities into five functional categories - sitting, socializing, bicycling, exercise and nature recreation). On-spot count through direct observation of age classes such as youth (including children and teenagers; under 18 years, adult (between 18 and 65 years), and the aged (over 65 years) was done. However, field researchers conducted group interviews for each park in which observed demographic patterns were discussed and documented. The study adopted two observation protocols and one protocol for interviews with park user, which guided the collection of structured observations, qualitative field notes, and photographic documentation. The Researchers worked in pairs to both enhance reliability through corroboration and provide greater richness of debriefs and field notes. In addition to paired

Table 1: Interview Distribution Sequence.

Urban Residents	No. Interviewed	% Interviewed	No. of Response	% of Response
Traders	280	45.31	253	40.94
workers	231	37.38	219	35.44
students	82	13.27	68	11.00
Passers-bye	25	4.04	18	2.91
Total	618	100	558	90.29

debriefs, full team questions was conducted at the end of each day to gather observations and questions about sites as a whole and to reflect the number of locations of the public parks of research (Bradshaw and Stratford, 2015). The interview protocol was implemented in park interiors only, with topics covering: what people are doing in the park, why they came to the park, how often they come, how far they travel, where else they go for outdoors, and whether or not they participate in any environmental stewardship groups. Researchers selected every third adult park user encountered and approached for a brief interview, to introduce randomization and reduce selection bias (Fennel et al., 2017). Interviews remained anonymous as 618 interviews were conducted through purposive sampling technique. The classes of people interviewed include urban residents - traders, workers, students and visitors (passers-by) with 90.29% response rate (Table 1).

This paper developed a mixed-method social assessment of uses and meanings of urban public space; pilot-surveyed this method by applying it to 2 acres of public green space within the neighborhood of the study area; Identifies functional areas in parks; and provided recommendations for incorporating functional parks areas and social meaning into park management and resilience planning.

RESULTS

The gender composition was 348 male (56.3%), 249 female (40.3%), and 21 unrecorded (3.4%). The age composition was 484 adults (78.3%), 107 seniors (17.3%), and 27 unrecorded (4.4%). Quality assurance procedures were conducted including examining errors, discussing and resolving discrepancies, ensuring accurate data entry and preparing for analysis. The study generated descriptive statistics and analyze trends in field observations and close-ended interview questions.

Qualitative field observations and debrief notes were transcribed; photos were organized by park and observation. Open-ended interview data were analyzed qualitatively. Responses to questions were coded separately by two different researchers via an open coding scheme that identified key phrases and

concepts (Chan and Tomball, 2017). These initial codes were compared and discussed, and discrepancies were examined using an iterative approach until consensus was reached among the coders, thereby enhancing reliability (Boland and Hammer, 2015).

Thematic clusters were then created to aggregate common codes together into broader themes. These clusters emerged out of key phrases, repeated language, and common ideas (Anderson et al., 2014). Specific subcategories were retained. We did not conduct a member check of our analysis with park users due to the brief nature of our interviews and not wanting to overburden our subjects. We did, however, conduct interviews in pairs, allowing for verification of interpretation across researchers; and we shared interim results with park managers to clarify questions and strengthen the validity of the findings.

Park use

Direct counts of observed human activities offer a snapshot of what people are doing in urban public space in the Aba Urban district during rainy season after dry season.

The most common activities include sports—such as athletics, tennis, cricket, baseball, volleyball, and football (28.8%) and walking (25.0%)(Table 2), which is not surprising given the way in which parks are often designed to give tractability and springiness that supports sporting activities, than indoor games. Such flexibility like lawns, tracks, veritable display of greeneries and sit-out order for spectators foster uses of this kind.

Parks also serve as locations that specifically support socialization (13.9%). Note that this category was only selected when people were observed in pairs or groups, sitting and talking in place (e.g., barbecuing, picnicking, or talking on a bench). It was not applied to people engaged in educational tours or sporting events, although these, too, are social activities. At the same time, parks also serve as a space to be alone and to relax, as 9.8% of people were seen sitting, resting, or standing alone (not in groups).

When counting activities, it was observed that the age of park users, can be said to be 38.0% (18-40) years, youth 56.8% (41-60) years were adults, 5.6% (65 years

Table 2: Effectiveness of Sporting Activities within the Sampled User Population.

Sports Activities	Score	% (0.0)
Athletics	31	9.3
Tennis	43	13.0
Cricket	25	7.5
Baseball	18	5.4
Football	61	18.4
Walking	154	46.4
Total	332	100.0

Table 3: Users Frequency of Recreational Park Patronage.

Park Use	Score	% (0.0)	Remark
Daily	193	31.1	High
Weekly	190	30.7	High
Monthly	112	18.2	Moderate
Occasionally	59	9.6	Low
Rarely	64	10.4	Low
Total	618	100.0	

Table 4: Patterns of Prior Use of Recreational Park.

Prior Use	Score	% (0.0)	Remark
Graffiti, Art and Murals	135	36.78	Low
Trails	124	33.79	Low
Flyers and Stickers	108	29.43	Low
Total	367	100.0	

and above) were seniors. We also gathered information about the frequency of park use via interviews, asking park users close-ended question, "How often do you come to this park?" We found a range in frequency of use. The majority of respondents reported using parks on a daily (31.3%) or weekly (30.7%) basis, showing that parks are playing a function in the everyday lives of their users. At the same time, other interviewees replied that they visit parks only monthly (18.2%), occasionally (9.6%), or rarely (10.4%) (Table 3). Table 3, therefore, shows a reasonable level of patronage as about 62% of the surveyed population affirmed patronage.

To detect patterns of prior use, which we triangulated with our human activity counts, the study observed signs on the landscape made by previous park users and consider these as indicators of activity and engagement with the space (Table 4).

The most commonly identified signs were graffiti, art, and murals (21.8%) that were created as forms of communication, turf-marking, and artistic expression. The next most common sign was trails (20.0%), which were only counted if they were desire lines or cut-through created by erosion under people's feet. Paved

or mulched trails created by park managers were not counted.

Similarly, our protocol instructed field researchers not to count institutional signs common to city streets and parks. Yet, other signs, flyers, and stickers (17.5%) that were left by individuals, groups, and businesses were the third most common sign of prior use. Understanding park use not only at the moment in time, but also over time, provides more robust data for understanding how parks are functioning, which is important to consider for management and planning. These signs of prior use provide spatially explicit indicators of where different park uses and functions are occurring inconsistent patterns, for example pointing to key 'hot spots' of public engagement, sociability, and stewardship as well as consistent challenges for managers, such as vandalism sites and damaged property.

Condition and Characteristics of Park Complimentary Amenities

Approximately one-fourth of respondents (23.6%) said that they visited the park because of its amenities.

Amenities include bathrooms, barbecue pits, buildings, community centres, play equipment, parking, paths, trails, sports and recreation facilities, and nature centres. Why park amenities use varied across the sampled parks, the most commonly identified use were sports facilities and amenities for kids. The amenities categories were as well considered to include park characteristics: cleanliness, maintenance, and size, and the park maintenance staff crew.

Recreation Park and Refuge Management

Similar in frequency to the previous category, 13.7% of respondents identified how the park serves as a site of refuge. Interviewees sought out green space to get away from the crowds, sounds, and traffic of public recreational parks. In particular, they sought out the sense of isolation and peace and quiet scenario that they could find in the parks. Respondents also mentioned that parks could be a place to cultivate their personal health, in the face of physical ailments, mental stresses, and social pressures.

Sociability and Social ties

The final two thematic codes are distinct but related. Some respondents (4.5%) offered reasons for visiting the park as a place that supports sociability. Interviewees discussed visiting parks to socialize with friends, family, and the broader community. Other respondents (4.2%) described the social ties that they have to a park, including having family or friends who live nearby. Conceptually, these social ties have some overlap with the notion of place attachment. We coded responses as place of attachment, if they specifically referenced an attachment that had developed over time; and we coded them as social ties if someone identified having a social link to the park but did not specifically discuss this as a long-lasting, personal attachment to place.

DISCUSSION

The recreational function of urban public space is demonstrated in this study by the prevalence of recreational users and interviewees' of public parks to park amenities and activities. But this methodology also draws attention to the role of public parks in supporting a range of social relations, including those that are highly relevant to resilience planning (e.g. place attachment, sociability, and social ties). The data demonstrate the pervasiveness of social activities in which people engage, the way in which they create patterns for the use of public parks and the ways that social ties and the sociability of the space motivate park visitation.

Although respondents did not readily identify educational reasons for visiting parks, the study

observed park users engaged in both formal educational play such as 'puzzle' and 'spell-drill,' and informal educational play like 'ludo,' 'what' and 'draft.' The interviewee complained that less attention is given to some quite interesting sports-like activities, to the advantage of the more regularly patronized ones like: athletics and football among others (Table 2). The sense of place is a public park that is apparent in people's stated place attachment and place dependency on parks and their routine use of parks as a nearby resource (Harrison and Limb, 2017; Beebe, 2017; Allemande et al., 2013). While Bolton et al. (2016), found out that the 'local' and natural scenes emanates and relates to the people's sense of place. Thus, half of interviewees identified visitation as a function of distance from their homes; this result emphasizes the importance of parks as an important gathering spot for residents of surrounding neighborhoods.

The notion of finding refuge in nature as a respite from the densely built urban environment spans imperatives in various recreational categories such as spiritual values, inspiration, aesthetics, and social relations. The signs of human use data offer evidence of these public parks as well, as people created art and signage inspired by and set in nature. Certain waterfront parks also contained Hindu shrines—offerings to the water, as evidence of directly spiritual uses of urban public space (Folke et al., 2016). Moreover, interacting with elements of nature and the outdoors was discussed by interviewees as a reason to visit the park in its own right, without necessarily deeming these natural elements as having cultural, spiritual, or aesthetic values. Finally, cultural diversity, cultural heritage values, and knowledge systems did not emerge as key public parks because of the methodology used.

While we directly observed a diverse cross-section of residents engaging in a variety of public open spaces and public parks, a more in-depth interview, historical, or ethnographic approach would be needed to elicit these public parks in greater detail (Chan and Tomball, 2017). In sum, we find that urban public space is a crucial form of 'nearby nature' that provides space for recreation, activities, socialization, and environmental engagement and supports place attachment and social ties. The result of this study has shown that urban parks, through their use by and interactions with humans, are producing vital social meanings and public parks that facilitate individuals to engage in coping strategies against chronic stressors in the urban environment.

Certain public parks were more easily detectable than others via social assessment, including recreational values, social relations, educational values, and sense of place. We found existing public parks categories of inspiration, aesthetics, and spirituality through analyzing the use, function and social meanings of urban parks as sites of refuge and public parks in which people interact

with elements of nature. However, like Anderson et al. (2015), we note that the number of times a public park was mentioned in interviews is not an indication of the value of that public park. In addition to relating park use and social meaning to public parks, we also examined park use and meaning in response to a system disturbance from dry season. The researchers found that park users made multiple mentions of the impact of dry season and harmattan on urban public space as well as their interest in engaging with park restoration and stewardship, which can be viewed as coping strategy.

CONCLUSION

For integrating urban ecosystem and public parks management into planning; our social assessment methodology provides managers and planners with a means of assessing public parks contributed by parks to the greater public recreational parks social-ecological system. Planners could utilize these protocols to collect data on a consistent basis across the entire city and integrate them into park management and citywide resilience planning when considering green infrastructure and public well-being. Therefore, incorporating public parks within the practice of resilience planning; helps to shift the balance of this approach from the engineered and physical, to the human and the social.

Furthermore, instead of considering open spaces as static repositories of services within the public parks, we can consider parks as human-produced cultural landscapes where people are co-creators of public parks and services in their roles as users, stewards, and 'ecosystem engineers' (Bethel et al., 2017; Chan et al., 2014). Thus, further research is needed to fully understand public parks and mechanisms involved in the co-creation of public parks through the interactions of urban public space and park users. Resilience planning at the municipal level to date has focused largely on built structures and biophysical capacities of urban public space. However, understanding that public parks contributed by parks in our study area can inform municipal agencies, including public recreational parks and OSDC office of recovery and resiliency in their resilience efforts in Aba urban neighborhoods by identifying which public parks are being provided where across the district.

As we gain a better understanding of the relationships among social resilience, public parks, and human well-being, these data will become increasingly valuable planning public parks for the greater public open space recreational parks area. These data can be used across scales by making improvements to specific sites as well as across sites in a district, as we now understand the different uses, functions, and meanings associated with individual parks. As many districts, cities, and areas

consider new procedures for resilience planning, we recommend that these efforts build upon the ecosystem services and public parks framework, more fully taking into account the social dimensions of urban parks, and explicitly integrating the concept of social resilience, as efforts are put together to manage cities as crucial human habitats and social-ecological systems.

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