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A Community-Driven Approach to Nature-Based Master Planning for Emilio Aguinaldo Park, Baguio City, Philippines

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Abstract

Baguio City, a Highly Urbanized City (HUC), faces challenges in balancing built-up zones with open spaces, which impacts social cohesion and well-being. This study aimed to develop a decentralized approach to redesigning Emilio Aguinaldo Park using nature-based solutions (NBS) and capitalize on its potential as a green lung within the metropolis. Residents and park visitors provided information for this study through surveys and focus group discussions. The findings of this study guided the development of a master plan for EAP, giving community-led initiatives and nature-based solutions of the most significant importance to strengthen the park's function as a green area and community resource. Key themes reveal that the community prioritizes strategies that address environmental quality, health and wellness, recreational spaces, social interaction and community, safety and security, nature and aesthetics, and amenities and facilities. With the overall social acceptability of nature-based solutions as "Acceptable". The results of this study guided the development of a master plan for EAP, giving community-led initiatives and nature-based solutions of the most significant importance to strengthen the park's function as a green area and community resource. The decentralized master plan promotes resilience and a sense of ownership among the local community and prioritizes the need for recreational space. Also, it targets the crisis in urban resilience by balancing the coexistence of public areas with integrated urban management techniques.

Keywords

Nature-Based solutions; Community Participatory; Urban Green Spaces; Open Space Design; Public Parks

1. Introduction

Open spaces are integral to the urban built environment, encompassing disciplines such as landscape design, outdoor architecture, and urban planning. Open spaces serve not only as recreation areas and breathing spaces for residents but also to counter increased urban density by introducing non-built-up, permeable areas. However, highly urbanized and densely populated areas often suffer from fewer open spaces, which dramatically affect inhabitants' behaviors, well-being, and overall health. High-quality public open spaces, including pedestrian-only streets, squares, parks, playgrounds, and other communal areas, have played an important role in health urbanism by promoting physical activity, social interaction, and mental well-being. (Knöll & Roe, 2017; Motomura et al., 2022) Moreover, the physical condition and accessibility of public open spaces also influence how people use them, which is the main indicator that reflects people's perceptions, emotions, and socio-cultural needs. (Han et al., 2022).

In the Philippines, the pace of urban expansion often outstrips the planning processes needed to assure balanced growth. (Nagayo et al., 2024; Pernia & Paderanga, 2010) This imbalance has contributed directly to the decreasing public open spaces in urban areas where people can socialize and practice an active lifestyle. These conditions significantly make cities less livable and less sustainable, and increase vulnerability to natural and human-made disasters. (Department of Budget and Management, 2018). In the context of Baguio City, a Highly Urbanized City (HUC) with an urbanization level of 64.70% in 2020 (Philippine Statistics Authority, 2022a) The city's current open spaces are at only 12.74%, or approximately 732 hectares (City Planning, Development, and Sustainability Office, 2023), resulting in an average of 19 square meters per resident. This figure needs to reach the demand of 22 square meters to satisfy the prescribed minimum 15% benchmark (National Building Code of the Philippines [P.D. No. 1096], 1977) for open spaces. Furthermore, studies show that Baguio's open areas are dispersed unevenly, frequently unused, and susceptible to unplanned encroachments or infrastructure degradation. (Estoque & Murayama, 2017; Gonzales, 2016; Gozon, 2023; Macaspac et al., 2024). This emphasizes the need for integrated spatial planning and sustainable management practices to preserve the area's ecological and social functions.

There is widespread agreement that social cohesiveness can be improved through urban design and planning systems, particularly when public spaces are created through community-led (Aelbrecht & Stevens, 2019; Kim & Kaplan, 2004) When public places are designed through community engagement, it promotes a deeper sense of ownership, trust, and cooperation among residents. As Aelbrecht & Stevens (2019) Argue, participatory planning approaches can negate the growing ‘generic-ness’ of contemporary public spaces by integrating the identity and values of the people who use public spaces. When residents participated in shaping urban design, public places more effectively reflected the culture, needs, and expectations of the community. These initiatives not only ensure community and political support for urban projects but also inspire civic participation and cultivate emerging leaders who can help shape urban environments in creative and inclusive ways. (Aelbrecht & Stevens, 2019) Thus, community-led urban planning is not just a tool for enhancing livability but a critical strategy for strengthening social engagement, rebuilding community trust, and improving urban resilience. (Gehl, 2011, 2013)

Social acceptability is an important determinant of successful NBS implementation, particularly in contexts where such interventions are not yet mainstreamed in policy and practice. (Chausson et al., 2020; Dumitru et al., 2020), as in the case of Baguio City, which remains compliant and bound to traditional development when it comes to infrastructure. Therefore, it is crucial to note that the erosion of social cohesion has tangible impacts during crises. In urbanizing areas like Baguio, vulnerabilities are heightened by stress caused by climate events. The more frequent and intense flash floods due to impervious surfaces (Southeast Asia Development Solutions, 2024) and aging drainage systems (City Government of Baguio, 2021) They are not only indicators of environmental degradation but also of the consequences of fragmented communities and disconnected urban development. In this context, the hazards of disasters are not only environmental barriers; they also mirror underlying systemic issues like low social cohesion and shrinking landscapes. This is further supported by the hydrodynamic flood modeling research study. Asian Development Bank (2023) This identifies many flood-risk areas in Baguio City, such as Barangay Salud Mitra, where Emilio Aguinaldo Park is located. A 'barangay' is the smallest administrative division in the Philippines, equivalent to a village, neighborhood, or community. The study explains how highly developed areas, narrow corridors, and raised structures impede the flow of surface water, which worsens the impact of flooding. Particularly, the flood risk

map (Figure 1) shows that Emilio Aguinaldo Park and the surrounding buildings (Figure 2) are extremely prone to flooding. These findings emphasize that urban hazards, such as flooding, are not merely environmental issues but also manifestations of underlying systemic problems—shrinking landscapes, land use planning deficiency, and compromised community-level preparedness.

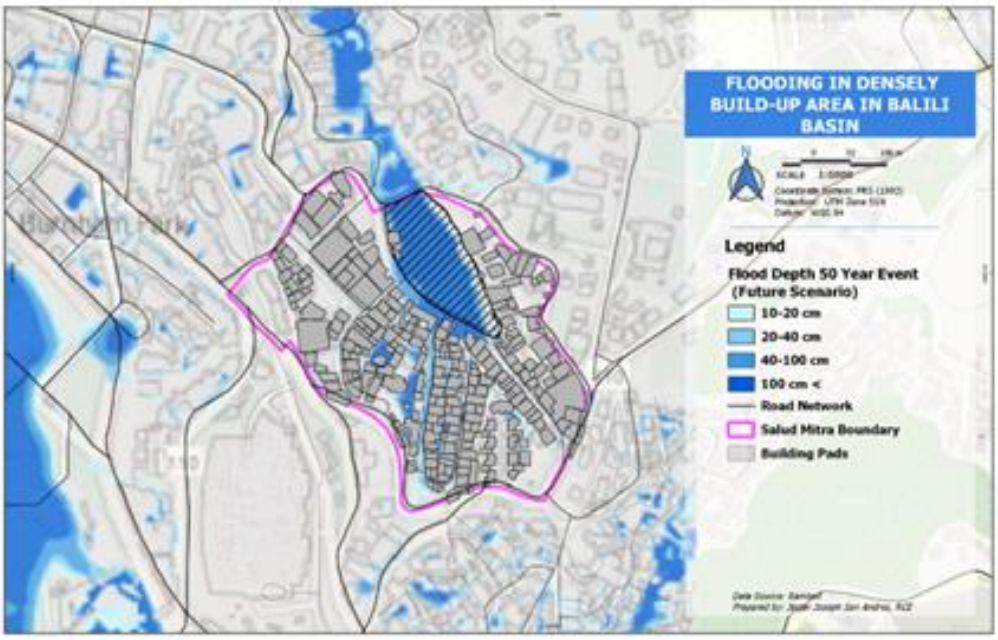

Figure 1: Future scenario of flooding event in Emilio Aguinaldo Park. (Source: Asian Development Bank, 2023)

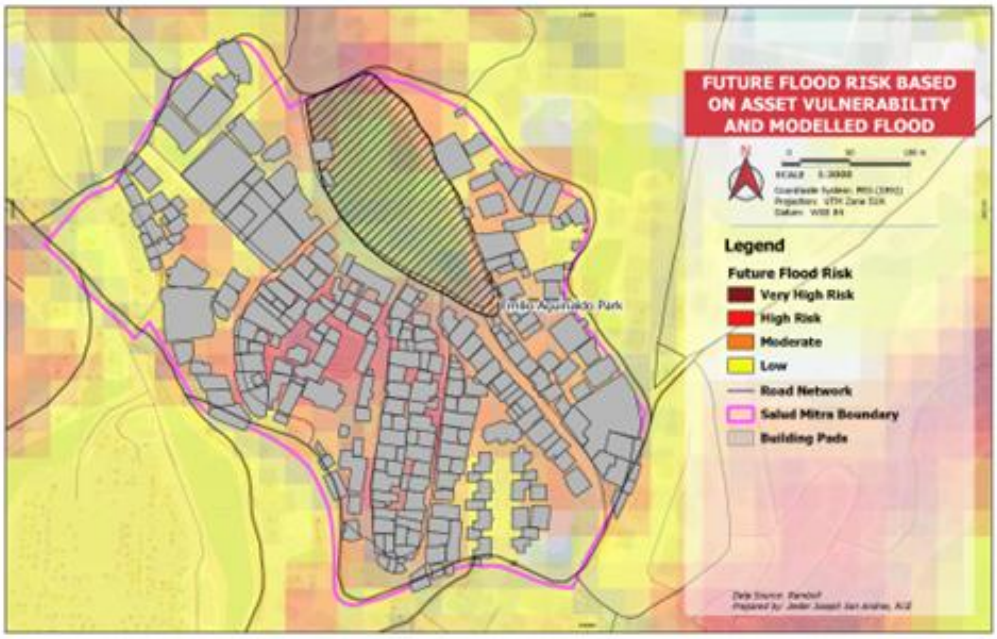

Figure 2: Map of future flood risk based on asset vulnerability and modeled Flood hazard. (Source: Asian Development Bank, 2023)

To address these interconnected challenges, it is important to adopt integrated approaches that balance the ecological and social dimensions of urban growth. Nature-Based Solutions (NBS) offer an effective framework by harnessing natural systems—like green areas, permeable surfaces, and restored water courses—to reduce environmental hazards while enhancing quality of life in cities. (Cooper, 2022; Cortinovis et al., 2022; Debele et al., 2023; Hobbie & Grimm, 2020; Magdelenat, n.d.) In Baguio, integrating NBS into urban planning is especially critical with its topography, rapid urbanization, and vulnerability to extreme weather conditions. Further, decentralizing open space planning and management—like parks—can enable local communities to co-create climate-resilient spaces that reflect the local communities' respective needs and values. Accordingly, this study aimed to develop a community-driven, nature-based master development plan for Emilio Aguinaldo Park in Baguio City. It specifically sought to demonstrate how participatory processes and localized data could inform the integration of NBS strategies into urban open space design to address both ecological risks and community needs.

2. Methodology

The study used a mixed-methods approach combining a city-wide online survey and focus group discussion to gather insights on park use, design preferences, and awareness of nature-based solutions (NBS). The survey aimed to identify the most wanted features by assessing the word frequency analysis, which determined desired features such as community facilities, open space, walking routes, and security concerns. In addition, social acceptability analysis was performed to determine community acceptance of the implementation of NBS in public open space. Responses gathered through the survey were analyzed using a set of indicators established within this research, and quantitative analysis was also conducted to establish the level of public acceptability towards NBS. Findings from the above approaches were used to inform the design process and guide the formulation of a socially responsive and ecologically efficient master plan. The overall methodology in the development of the master plan is presented in Figure 3.

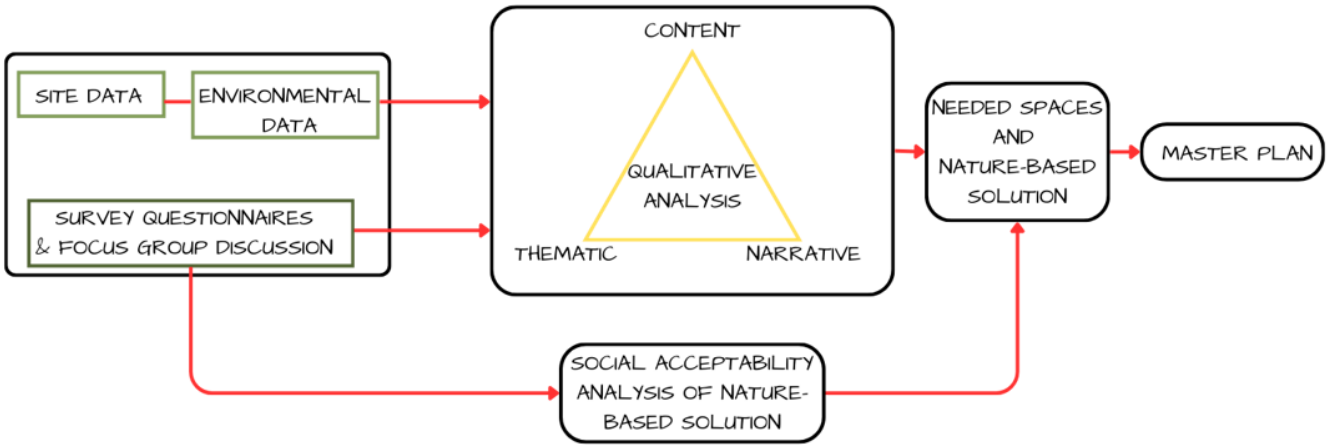

Figure 3: Methodological Framework in the Development of the Emilio Aguinaldo Park Masterplan (Source: Authors)

2.1. City-wide Online Survey and Focus Group Discussion Overview

To determine the appropriate population size, the researcher used the 2020 Baguio City population data, and the number of residents in Baguio City was 363,151 (Philippine Statistics Authority, 2022b) Within this population, 70.65% (256,566 individuals) were aged between 18 and 64 years old, which was the target population considered in the study. Following the Yamane, T. (1967) sample size equation (using z =1.96; P = ~0.50; e=0.05) yields a minimum sample size of 192 young adults (ages 18-24) and 192 older adults (ages 25-64), totaling to 384 respondents for this study. Discrepancies in the age limits are seen as the study limited its respondents to non-minors and non-seniors. To exceed this minimum and to ensure that many individuals were able to participate, the researcher employed online surveys and field interviews. The online survey and focus group discussion were administered in August 2024 and were shared through the Baguio City Public Information Office and social media.

The survey questionnaire was based on developed indicators of the perceived advantages of the parks with Nature-Based Solutions (NBS), such as quality of life. (Gwedla & Shackleton, 2019) physical and mental health (Campbell-Arvai, 2019; Gashu et al., 2020), recreational and exercise space (Nath et al., 2018) biodiversity and wildlife support (Wang et al., 2019), reduction of stormwater runoff (Miller & Montalto, 2019) and enhancement of air quality and climate control (Fernandes et al., 2019; Guenat et al., 2019).

The following overview of the survey groups the questions into five (5) sections based on question content. Section one (1), which is the demographics questions, asks the respondents for barangay, civil status, gender, and age group. Section two (2) assesses respondents' knowledge about Emilio Aguinaldo Park, including whether they visit the park or not. If the respondent's answer to both questions is “no”, the respondent will be redirected to the next section of the survey (Perception of Parks). Respondents will be asked “yes”- “no” answers and multiple-choice questions asking for park visitation habits and preferences. Section three (3) of the questionnaire is designed to assess respondents' satisfaction with the current state of Emilio Aguinaldo Park. Questions about the park include the state of the shrine and museum, park facilities, and overall environment. Respondents will be asked to rate multiple park

qualities using various rating scales (five-point Likert scale, multiple choice, and yes/no questions) to provide a complete evaluation of their park visit. Section four (4) assesses respondents' understanding of the importance of parks within the urban context. Questions cover the benefits of the park for individuals and communities and the incorporation of nature-based solutions and flood mitigation features in parks. Respondents will be asked to rate questions using various rating scales (multiple choice and yes/no questions) to provide a complete understanding of the role of parks. Section (5) addresses respondents' priority and development preferences in the rejuvenation of Emilio Aguinaldo Park. Respondents will be asked to rate questions using various rating scales (multiple choice and yes/no questions).

To validate and refine the survey instrument, comments were gathered from a group of eight experts from diverse fields relevant to Nature-Based Solutions (NBS) and green infrastructure. The experts represented the fields of forestry, geology, urban planning, engineering, architecture, and environmental science. The panel reviewed all the survey questions, giving ratings and suggestions that improved the instrument's reliability and validity.

Focus group discussions (FGDs) consisted of residents of Barangay Salud Mitra, where Emilio Aguinaldo Park is situated, and residents of nearby barangays: Engineer's Hill, Kabayanihan, Session Road, Upper General Luna, and Cabinet Hill. The barangay officials assisted in inviting respondents, emphasizing individuals with significant knowledge of or a strong connection to the park, including those with historical backgrounds in the place. The participants from the community who were involved were youth, the elderly, artists, barangay officials, students, and indigenous people. The FGDs were structured to consider perceptions of the park's current condition, its history, its utilization by the people, and its potential future. The groups were formed to allow free-flowing discussion across various ages and social classes to ensure a diversity of ideas was brought forward.

The researcher used Taguette, which is an open-source qualitative research software, to analyze the FGD transcripts and survey questionnaires, and adapted the (Braun & Clarke, 2023) reflexive thematic analysis (Figure 4) following six phases: i) familiarization; ii) doing coding; iii) generating initial themes; iv) developing and reviewing themes; v) refining, defining, and naming themes; vi) writing for analysis. The study generated themes and codes from the survey questionnaire and FGDs ensured a structured understanding of community priorities, which directly informed the park's proposed master plan.

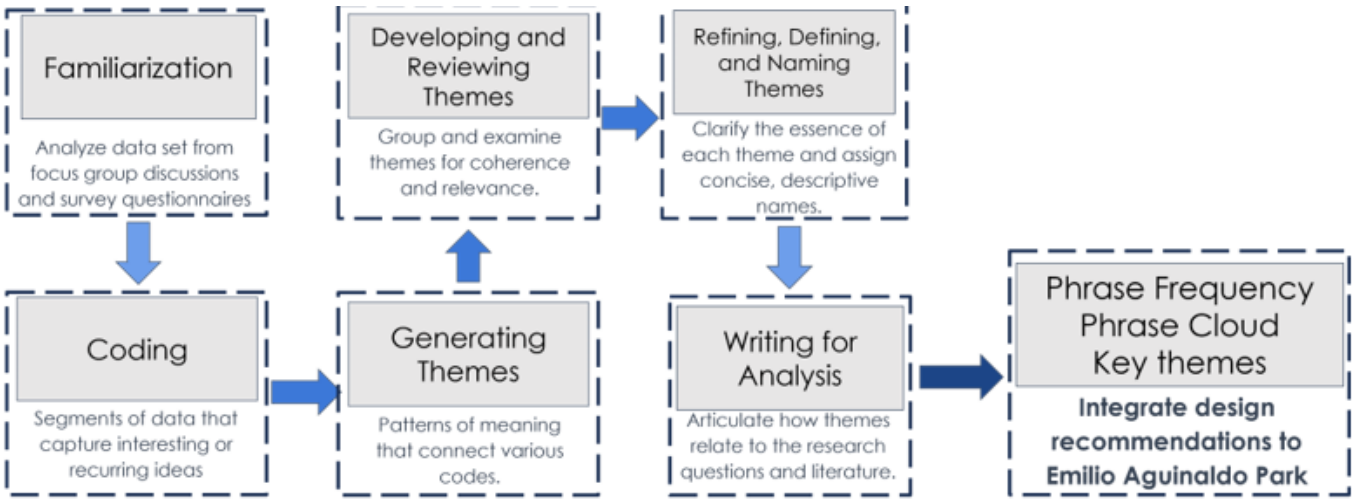

Figure 4: Reflexive Thematic Analysis Framework (Source: Authors)

2.2. Social Acceptability of Nature-based Solutions

The sets of indicators from previous research (Sowińska-Świerkosz & García, 2021) were correlated with the survey questions based on logical relevance and direct connections to measure the social acceptability of nature-based solutions, as shown in Table 1. These indicators reflected key social determinants that influenced Nature-based Solutions (NbS) acceptance and indicated the values and priorities of the community, which influenced the park master plan.

Table 1: Social acceptability of nature-based solution indicators (Source: Authors)

Indicator	Measure	Survey Reference
Environmental Awareness	Number of respondents who are knowledgeable and aware of environmental problems	Q20 (Environmental Benefits) and Q21 (Clean Air, Flood Control, etc.)
Support for Sustainable Development	Number of people declaring a greener and sustainable development	Q22-24 (Rain gardens, natural river, and native plants), Q25 (Sustainability), and Q26 (Greener Park)
Social Space Preferences	Number of respondents prioritizing the diversity of elements facilitating social interactions	Q17 (Beneficial aspects like picnic areas, playgrounds) and Q25 (Picnic zones, seating, etc.)
Interest in Sports	Number of respondents who are interested in sports facilities	Q7 (Sports activities) and Q17 (Beneficial sports facilities)
Interest in Play Areas	Number of respondents who are interested in playgrounds	Q17 (Playgrounds) and Q7 (Playground activities)
Interest in Education Features	Number of respondents who are interested in educational elements	Q7 (Educational visits) and Q25 (Education through arts and crafts)
Educational Value	Number of respondents benefiting from educational values	Q7 (Educational Visits)
Active Use of Green Spaces	Number of people declaring the active use of green spaces (outdoor activities)	Q7 (Activities like jogging, walking)
Aesthetic Value	Number of people appreciating the aesthetic values of a solution	Q25 (Aesthetic importance)
Accessibility	The number of people who find the urban green area accessible	Q11 (Accessibility features) and Q19 (Overall satisfaction)

Descriptive statistics were used to understand the distribution and patterns of responses in the context of the survey data on the social acceptability of nature-based solutions. By calculating frequencies and percentages for each indicator, the researcher determined how many respondents chose each indicator. Calculating the means for quantitative data provided insights into the central tendency of the responses. To evaluate each percentage value of indicators and the overall percentage value of indicators, the researcher used the perception levels evaluation grid, as shown in Table 2 by Petrone et al. (2022), and compared it to Table 1 to determine the social acceptability of each indicator. Every component of the plan, such as particular educational zones (e.g., local ecosystem signages, outdoor learning spaces, demonstration gardens, etc.), playgrounds (e.g., natural play areas, sensory zones), sports facilities (e.g., basketball court, volleyball court, stage area), aesthetic improvements (e.g., native plant landscape, community arts), and community facilities (e.g., open gathering spaces, community halls) corresponded to a particular indicator.

Table 2: Perception levels evaluation grid (Source: Petrone et al., 2022)

Limit for Acceptability				**Maturity**	
Not Acceptable				Scaling- up	
0% - 17%	17% -35%	36% - 50%	51% - 67%	68% - 85%	86% - 100%
Not Acceptable	**No Relevance**	**Doubtful / Reserved**	**Acceptable**	**Very Acceptable**	**Excellence**

3. Results

This chapter presented the synthesized findings of the online survey, focus group discussions (FGDs), and social acceptability analysis, highlighting key patterns and community perspectives that informed the planning approach.

Each of the research processes yielded distinctive perspectives that informed the conceptualization of the Emilio Aguinaldo Park development. The online survey yielded quantitative information on user demographics, perception, and usage patterns of the park; the FGDs offered in-depth experiential insights that placed these data within context and elaborated on them; conversely, the social acceptability analysis established how public opinions correlated with certain indicators relevant to nature-based solutions (NBS). All the findings were synthesized together to determine common themes and translate these into spatial concepts incorporated into the proposed master plan. These concepts were designed to enhance the overall quality of life through the addition of green spaces, multifunctional spaces, and inclusive design features that address community needs.

3.1. Online Survey

The sample size needed was achieved, and all age categories had more respondents than anticipated. Yet, the broad age range, particularly within the 25–64 range, may cause some subgroups to be under- or over-represented. The wide range may mask variations across life stages such as early career, parenthood, and pre-retirement. Such differences may affect what individuals like in playgrounds or recreation areas. The age category of 25–64 was selected to ensure national demographic criteria employed in social research and planning in the Philippines, particularly by institutions like the Philippine Statistics Authority (Mapa, 2022). It encompasses most of the working-age and adult population, who are most likely to participate in planning and utilizing public spaces regularly.

The majority of the 714 online survey respondents were older adults, predominantly female, with most identifying as single. The detailed sociodemographic distribution is presented in Table 3.

Table 3: Sociodemographic distribution of the respondents (Source: Authors)

Socio-Demographic Characteristics	Categories	Statistics (N=714)
Age	18 to 24	199 (28%)
	25 to 34	173 (24%)
	35 to 44	176 (25%)
	45 to 54	82 (11%)
	55 to 64	84 (12%)
Gender	Female	436 (61.06%)
	Male	276 (38.66%)
	Others	2 (0.28%)
Civil Status	Single	423 (59.24%)
	Married	278 (38.94%)
	Widow/Widower	10 (1.40%)
	Legally separated	2 (0.28%)
	Divorced	1 (0.14%)

The survey indicated that although 86% of the population is familiar with Emilio Aguinaldo Park, only 42% visit the park, and the majority visit there only a few times a year. This discrepancy indicates a familiarity gap and usage, most probably due to a lack of parking facilities, accessibility, or appeal to everyday routines. Most users are passive, such as watching nature, yoga, or meditation (37%). Fewer are active exercise users (19%). This indicates that the park is primarily a quiet space for contemplation, though broader improvements could invite more diverse usage.

Satisfaction with the existing condition of the park is divided; 43% were satisfied, and 57% were dissatisfied or undecided. Nevertheless, 86% still believed the park had not lost its natural character, demonstrating its existing environmental and character significance. Most of the community generally preferred a greener park (98%), and

sustainability, safety, and waste management were relevant. There was also strong support for multi-functional improvements, such as water storage and spaces for community activities.

To more effectively identify qualitative sentiments from open-ended responses, a phrase frequency analysis was conducted. As we can observe from Figure 5, phrases 'physical and mental health,' 'clean air and water,' 'habitat for species,' and 'lesser pollution' were most often cited, reflecting dominant community values.

Figure 5: Phrases Cloud Frequency from Online Survey (Source: Authors)

3.2. Focus Group Discussion

The FGD gathered a diverse set of 77 community members, including younger adults, senior citizens, barangay officials, people with disability, and local workers, ensuring different perspectives across age, occupation, and familiarity with Emilio Aguinaldo Park (EAP). While there were a few groups, including youth, the elderly, women, and people with disabilities, who were overrepresented or underrepresented in the research, those who were surveyed contributed valuable, context-specific observations. Furthermore, these findings were used to confirm or substantiate the overall patterns or trends identified through the online survey.

Strong emotional ties to EAP were observed, with numerous individuals recalling childhood memories associated with nature, play, and community relationships. Such recollections emphasize the park's significance that transcends mere recreational purposes, positioning it as a collective cultural and environmental domain. Participants expressed concern over safety due to inadequate lighting, cleanliness affected by stray animals, and lack of inclusive facilities for children, seniors, and persons with disabilities, which correspond with survey results indicating that only 42% of respondents frequent the park despite 86% possessing an awareness of its existence.

Key concerns included inadequate lighting, the absence of amenities, and stray animals, which contributed to low utilization. Both FGDs and surveys, however, reported strong interest among the community in multifunctional facilities that promote wellness, socialization, and environmental renewal. Passive uses such as relaxation and appreciation of nature were emphasized, with recommendations to incorporate nature-based elements such as natural streams, trees, and gardens.

Overall, the FGD enhanced the understanding of the role of EAP in community life, highlighting the significance of the creation of a park that respects memory, encourages diverse activities, and promotes environmental and social well-being. These qualitative observations supported the findings of the survey, specifically the necessity of more inclusive, multi-functional, and eco-friendly park facilities.

3.3. Social Acceptability Analysis of NBS

After evaluating which survey questions correlate to the social accessibility indicators, the researcher tallied the number of respondents declaring for each indicator, as shown in Table 4 and Figure 6. Based on the perception level grid evaluation by Petrone et al. (2022), the responses were categorized as follows: Red (0% - 17%: Not Acceptable), Orange (17.00% - 35.00%: No Relevance), Yellow (36.00% - 50.00%: Doubtful / Reserved), Light Blue (51.00% - 67.00%: Acceptable), Light Green (68.00% - 85.00%: Very Acceptable), and Dark Green (86.00% - 100%: Excellence). The classifications directed the analysis of social acceptability indicators to identify the attitudes of various age groups toward urban parks. The respective social acceptability level for each indicator was described in terms of the allocated color-coded system.

Table 4: Social acceptability indicators for nature-based solutions across age groups (Source: Authors)

Social Acceptability Indicator	**Number of Respondents (N=714)**		**Tallied Percentage of Indicators per Age Group (%)**	
	Younger Adult (18-24) (N=199)	**Older Adult (25-64) (N=551)**	**Younger Adult**	**Older Adult**
In1: Number of respondents who are knowledgeable and aware of environmental problems?	171	467	85.93	84.75
In2: Number of respondents declaring a greener and sustainable development?	165	440	82.91	79.85
In3: Number of respondents prioritizing diversity of elements facilitating social interactions (seats, tables, picnic zones, etc.)?	101	361	50.75	65.52
In4: Number of respondents prioritizing educational elements?	40	133	20.10	24.14
In5: Number of people appreciating the aesthetic values of a solution?	80	174	40.20	31.58
Social Acceptability Indicator	**Number of Total Respondents (N=302)**		**Tallied Percentage of Indicators per Age Group (%)**	
	Younger Adult (18-24) (N=80)	**Older Adult (25-64) (N=222)**	**Younger Adult**	**Older Adult**
In6: Number of respondents who are interested in sports facilities?	58	121	72.50	54.50
In7: Number of respondents who are interested in playgrounds?	48	141	60.00	63.51
In8: Number of respondents benefiting from education values?	24	88	30.00	39.64
In9: Number of respondents declaring the active use of green spaces (outdoor activities)?	80	202	100.00	90.99
In10: Number of respondents who find the urban green area accessible?	32	59	40.00	26.58
Total Percentage of Social Acceptability Across Age Groups			**58.24**	**56.11**

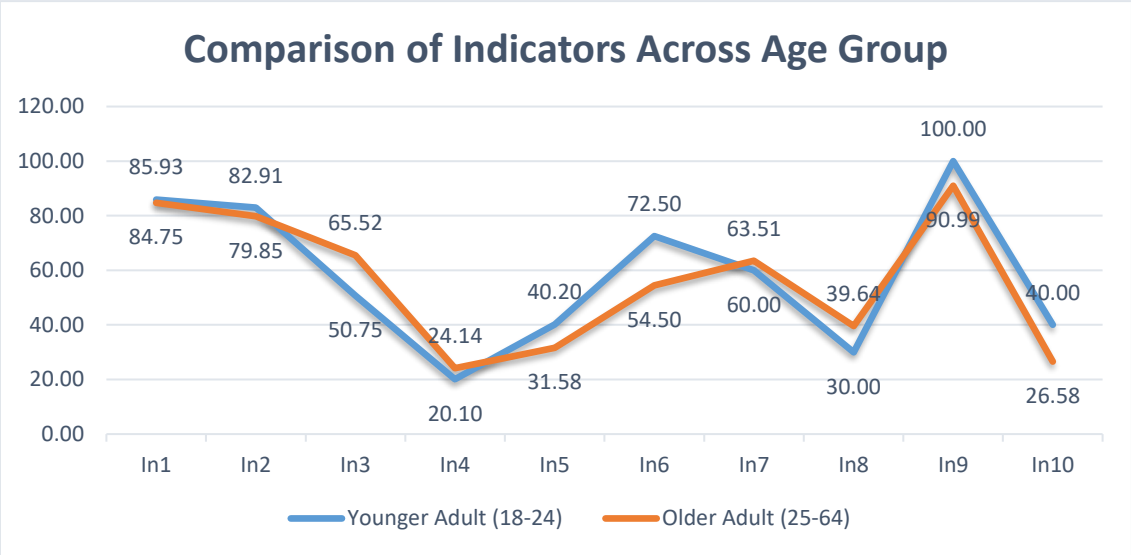

Figure 6: Tallied Percentage of Indicator per Age Group (Source: Authors)

Both younger and older adults have high awareness of environmental concerns (85.93% and 84.75%, respectively) and support sustainable development programs (82.91% vs. 79.85%). However, there are significant differences in specific preferences. Older people have a higher preference for social interaction facilities like picnic spots and seating facilities (65.52%), in comparison to young people (50.75%). Young people, however, show a much higher inclination toward aesthetic facilities (40.20% vs. 31.58%) and sports facilities (72.50% vs. 54.50%).

Educational aspects received the least interest from both groups, with only 24.14% of the older age group and 20.10% of the younger age group. Younger adults also indicate higher use of green space activities, such as walking or nature watching (100%), than older adults (90.99%). Accessibility wise, 40.00% of younger adults thought green spaces were accessible, but only 26.58% of older adults thought the same.

Generally, both age groups rated nature-based solutions (NBS) in Baguio City as "Acceptable" with an overall acceptability rate of 57.18%. However, a large 42.83% of the entire sample had a limited interest in NBS due to a lack of awareness, resistance to change, reduction of green spaces, and lack of trust in implementation processes.

3.4. Thematic Correlation and Spatial Translation

Synthesizing the qualitative and quantitative data assisted in establishing seven broad themes that reflect what the community values and prefers: (1) Environmental Quality, (2) Health and Wellness, (3) Recreation Spaces, (4) Social Interaction and Community, (5) Safety and Security, (6) Nature and Aesthetic, and (7) Amenities and Facilities. The broad themes were established from common words from focus group interviews and questionnaires, such as "walk," "clean," "air," and "interaction," and from revealed preferences in social acceptability scales. For example, the high rate of interest in environmental information and green development by the two age groups (In1 and In2: >80%) reflects that Environmental Quality is valued.

Community preferences for active (e.g., playgrounds, sports) and passive (e.g., yoga, meditation) recreation (In6, In7, In9) justified the preservation of Recreational Areas and Health and Wellness. Phrase cloud identification also emphasized terms like "mental health," "social health," and "interaction areas" the highest, validating the need for Social Interaction and Community spaces that are age- and gender-sensitive.

The social acceptability matrix (Table 4) showed age differences. Young adults (18–24) preferred green spaces (In9: 100%) and sports complexes (In6: 72.5%), preferring active youth spaces. Older adults preferred social spaces (In3: 65.52%) and learning spaces (In8: 39.64%), preferring amenities such as storytelling spaces and heritage walkways.

These findings were translated spatially through attribute-based clustering (Figure 7), which guided the master plan. The functional elements were mapped into themes through an iconography system that used symbols as

representatives of target users, activity types, and design objectives. This resulted in a multi-zonal park design where spaces are linked through shared priorities.

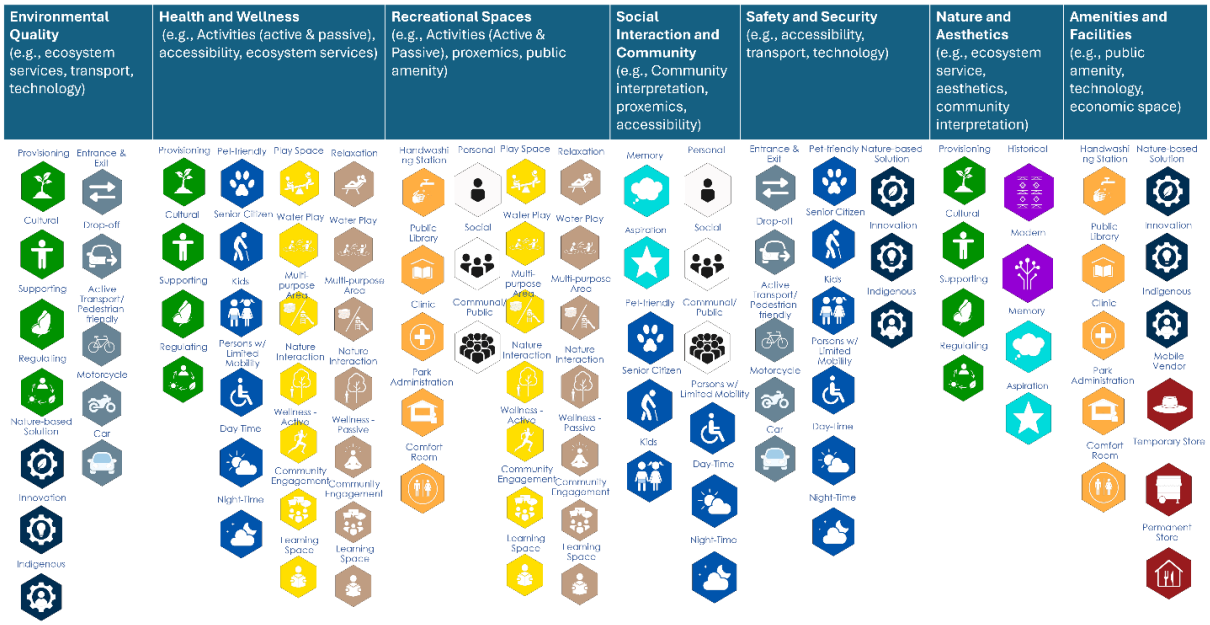

Figure 7: Icon Attribute-based Clustering from Data Analysis (Source: Authors)

These themes and clustering by attributes were translated into the master plan (Figure 8), where each zone is a particular priority. Environmental Quality is demonstrated by the retention pond, constructed wetlands, and rain gardens, which contribute to stormwater management and biodiversity. Health and Wellness are facilitated by space for active play, bike lanes, and sports courts. Recreation Spaces feature multi-use game areas and community gardens, which provide for active and passive use. Social Interaction and Community is represented by the Community Center, outdoor learning decks, and terraced seating areas. For Safety and Security such as, clear paths, lighting, and well-placed amenities contribute to visibility and comfort. The natural slope of the park and layered planting enhance Nature and aesthetics, while Amenities and Facilities such as the MRF, parking, and art totems provide significant infrastructure and cultural value. In essence, the new design is a multi-purpose, people-oriented park that is community-linked.

Figure 8: Emilio Aguinaldo Park Proposed Master Development Plan. (Prepared by: Landscape Architects Angelo Paulo Mogul, Christine Talidong, Mariae Roneen Crystal Savier Montero, and Joshua Miguel Abraham.)

Ensuring that Emilio Aguinaldo Park develops in a manner that is good for society, nature, culture, and the lack of community activities, and landscape improvements.

4. Discussion and conclusion

This study explored the potential of a community-driven and nature-based planning strategy to enhance Emilio Aguinaldo Park in Baguio City. The study proposes that while quantitative data may be useful in guiding policy, it must be placed in context in terms of local knowledge and community values to be able to act on people's spaces. In Baguio City, participatory planning is not a common practice, especially in public park and open space development. Urban planning in the city is typically top-down decision-making through government agencies, with minimal avenues for effective participation by the community. The participatory process utilized in this study is therefore a change from the typical city planning processes. It shows the potential of inclusive planning strategies to deliver more socially appropriate, ecologically responsive, and site-specific design responses. The process not only empowers the local stakeholders but also encourages a sense of ownership and long-term stewardship, which are typically absent in conventional government-initiated projects.

One limitation of this study is the broad age bracket used in the survey, the 25–64 age range. While justified by Philippine demographic standards (Mapa, 2022) To ensure statistical validity, this bracket aggregates individuals across diverse life stages, potentially obscuring nuanced preferences for urban space use. Patterns identified from focus group discussions assisted in substantiating this, which indicated that young adults enjoy active recreation, but the elderly favor passive and introspective activities. However, another significant limitation is that there is no obvious distinction between those who are parents, particularly parents with young children. Parents—particularly mothers—perceive public space differently because they are concerned with safety, require child facilities, and observe changes in visiting times or the way people use the spaces (e.g., visits late morning or afternoon). Parks are also highly significant social spaces for parents and carers, providing them with an opportunity to engage with the community and receive support from others. Future research needs to not only segment age more clearly (e.g., 25–34, 35–44) but also incorporate family status, particularly parents with children of different ages, so that design responses can be matched more closely to the needs of various stages of life.

Social acceptability analysis, based on Petrone et al. (2022) perception grid, indicated that overall perception of nature-based solutions (NBS) was "acceptable" at 57.18% but educational aspects and accessibility revealed weaker acceptance. Low scores in educational components (20.10–30.00%) and accessibility (26–40%) indicate that greening efforts alone cannot solve. This indicates the necessity for improved social and physical accessibility and more stimulating and mild educational measures. While educational features exist, individuals may not perceive them as being relevant or useful. Vasconcelos et al. (2024) reported low education levels in older individuals, and García-Antúnez et al. (2023) reported more restrictions for individuals with lower education. The findings indicate a trend of educational factors being less useful or relevant to various groups of individuals.

Comparison to the global literature indicates the significance of these findings. Studies by Giachino et al. (2021) and Giachino et al. (2021)Confirms that environmental consciousness is already high among urban populations and that utilizing green spaces for enjoyment and health is valued across age groups. But, as in the case of this research, physical access issues, trust in NBS effectiveness, and the value of educative attributes remain persistent challenges globally. Ferreira et al. (2021) and Ramírez-Agudelo et al. (2022). Also noted that though individuals are aware of urban parks, they utilize them less if design, management, or social attachment is absent.

This condition can be seen in how the Aguinaldo Museum is located inside the park. While it is significant in history, the privately owned museum appears to be disconnected from the community’s historical identity and is not seen as a relevant asset, making visitors less interested. Barriers like the park fence render the place less accessible and open, which means that there is a need for better connections with educational and cultural aspects that truly connect with the community.

These results also align strongly with the theoretical frameworks established by Jan Gehl and colleagues, particularly the idea that the presence of public spaces does not guarantee their use; the *quality of life between buildings* matters most. Gehl’s work stresses that successful public spaces offer protection, comfort, and opportunities for social

interaction. (Gehl, 2011, 2013; Gehl & Svarre, 2013). This concept directly gives community feedback, which highlights safety, closeness to nature, social areas, and areas that serve multiple purposes. In this study, the opinions given in focus groups and the need for more accessible, greener, and multi-use parks reflect the "soft city" ideas Gehl supports— an urbanism centered on human scale and community participation.

Critically, while the evidence indicates high levels of support for nature-based solutions, it also cautions that design alone does not guarantee acceptance. Trust in delivery, clear communication of benefits, and measurable outcomes will support community engagement. Older adults, for example, were more skeptical regarding NBS effectiveness, mirroring. Anderson et al. (2021)The conclusion is that effective green infrastructure projects need to establish trust over time.

At a more general scientific level, the research gives evidence that decentralized, community-driven nature-based solutions planning processes can be viable and beneficial beyond the traditional Global North locations where most participatory urbanism research has been concentrated. The case of the Emilio Aguinaldo Park demonstrates that participatory approaches can be adapted to suit highly urbanized, climate-exposed cities in Southeast Asia, generating means to construct more resilient and socially integrated urban environments. But the research also demonstrates that these models must pay attention to local culture and environment: what works in Europe or North America cannot be transferred directly elsewhere without adapting to local necessities, cultural values, and governance realities.

In conclusion, the community-led redesign of Emilio Aguinaldo Park proves that nature-based planning and community-driven planning can strengthen cities' resilience and livability. However, it must be grounded in an understanding of both quantitative trends and qualitative, lived experiences. Through combining environmental, social, and cultural needs and promoting ongoing public engagement, such methods can reclaim city green spaces. These can be imagined not merely as the city's lungs, but as part of the fabric of daily life, memory, and resilience.

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Ethics approval

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Conflict of interest

The authors declare that there is no competing interest.

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