Evaluating the Adequacy of Public Open Space for the Residents of Subdivisions in Cabanatuan City Central Business District

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ABSTRACT
Public Open Spaces (POS) and Urban Green Spaces (UGS) are vital elements of the urban milieu, providing recreational opportunities and enhancing residents' quality of life. However, in some localities in the Philippines such as the City of Cabanatuan particularly in its inner-city was considered as the urban congested core that caused the city to lack POS and UGS. A mixed methods approach was considered for data collection, including the study of the utilization pattern of residents, and measuring the actual space allocated for POS of each subdivision. According to the results, Cabanatuan City has only 3.6 square meters of POS per person, indicating a shortfall comparable to Manila's score in GCI. With a growing population and demand for open space, Cabanatuan City would need to provide at least 114.7 hectares of land designated for POS to achieve a good and healthy environment for its residents.

Keywords: Central Business District (CBD); Green City Index (GCI); Public Open Space (POS); Urban Green Space (UCS)

INTRODUCTION

A land that is reserved for public leisure and recreation such as open fields or park is called Public open space [1].In the urban milieu, Public open space is regarded as one of the vital and valued components in the growth of urban environment. In the Philippines, the need for public open spaces is well observed in law. The law mandates that providing open spaces such as sidewalks, alleys, curb or pavements, and road is necessary to provide a healthy environment especially for human settlements. Public open space has been a vital part of Filipino heritage since the occupation of the Spanish. Plazas have historical, cultural, and social significance and serve as central gathering places for various activities. The concept of plazas in the Philippines has its roots in the Law of the Indies[2]. Hence, as stated in other researches, UGS or urban green space such as parks and recreational areas provides health benefits [3] as it promotes physical activities. In addition, UGS provides social interaction and helps to provide a relaxing area through the immense urban greeneries brought by the phenomenon coined as the urban green space cooling effect[4].

In cities like Cabanatuan City, POS and UGS are limited to their urban core where the most densely populated area and robust commercial spaces can be found. Based on the City's Ecological Profile on 2022, Cabanatuan has only 111.56 hectares of parks and other recreational zone which comprise only 0.58% of the total land area of the city. Additionally, based on Asian Green City Index or GCI, Manila has only 5 square meters of green space per person[5]. This is far below the average index score which is 39 square meters of green space allocated per person [6].

The Study focuses on POS and recreational facilities that can be accessed by residents of subdivisions in Cabanatuan City CBD. For the assessment, the study measures the space allocated by subdivisions for public open spaces and what amenities they have provided. To provide a more accurate and comprehensive analysis, survey questionnaires with Likert Scale are given to residents. A Focus group was also employed to fetch relevant data. The aim of this study is to evaluate the adequacy of parks and recreational facilities. This will determine whether there is a need for additional city parks or just an improvement of an existing one. Since the right to public open space is mandated by law in the Philippines, this study assumes that all subdivisions have complied the PD 1216. However, different factors are expected.
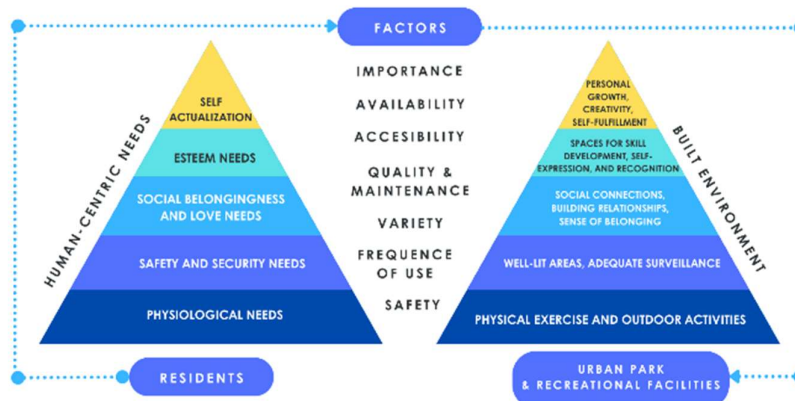
Fig. 1 Conceptual Framework adapted from A. H. Maslow, "A theory of human motivation. Psychological Review," Climate Change Management, no. 13, 2020.

By adopting the theory of Maslow's Hierarchy of needs[7], the researcher has expanded the conceptual framework into a more complex formula. From human centric needs of the residents of the subdivision in Cabanatuan CBD, we analyze what are the factors affecting their utilization pattern to the built-environment such as Public open spaces like parks. This will further enhance the understanding of the complex dynamics involved in residents' utilization and satisfaction in places such as urban parks and recreational facilities.

The researcher collates relevant data from different sources. National Legislations of the Philippines related to open spaces and park provision is necessary to review to provide a cross reference between the existing public open spaces in Cabanatuan city against the required public open space mandated by the law. The result is then anchored to the Asian Green City Index, to provide further comparison. Lastly the benefits of Parks in Urban community are elaborated to provide comprehensive information where the analysis of utilization pattern of parks is based.

A. National Legislations of the Philippines related to Open Spaces and Parks provision
The researcher gathered national legislations related to open spaces and parks to recognize that there was a demand for additional parks in the city. PD 1216 or Open space law was the best example of a law wherein it stated that there is a need to develop and sustain healthy urban areas with open spaces, infrastructure, and pathways to elevate residents' well-being.

B. PD 1216 - Open space in residential subdivisions
Open Space law stipulates that thirty percent (30%) of a proportion of the entirety of a residential development must be allocated, constructed, and upheld as unobstructed terrain intended for parkland and leisure zones.

Density (No. of lots/Dwelling units per hectare)	Allocation (% of gross area for Parks and playgrounds)
20 below	3.5%
21 to 65	7%
66 to 100	9%

Table 1 Parks and Playgrounds Allocation under Presidential Decree No.1216,1977

The allocation of open space in the provision is based on the density of housing within the subdivision. Low-density housing has a smaller percentage of open space allocated compared to higher-density housing categories.

The reason for this allocation can be attributed to the assumption that low-density housing typically occupies larger individual lots and therefore already provides more open space within each lot. As a result, a smaller percentage of the overall gross area is allocated for open space in low-density housing subdivisions.

Low-density housing is generally associated with larger private yards or gardens, which may compensate for the relatively smaller allocation of open space within the subdivision. This allocation aims to strike a balance between providing adequate open space for recreational use and accommodating the preferences and needs of low-density housing residents who may prioritize larger private outdoor areas.

C. PD 957 - Subdivision and Condominium Law
This law also conforms with the subsequent minimum standards that are applicable to local government's zoning ordinances as well as relevant provisions of the National Building Code of the Philippines if the project is with a housing constituent. We can notice its similarities with PD1216 on parks and playgrounds allocation of space.

Density (No. of lots/Dwelling units per hectare)	Allocation (% of gross area for Parks and playgrounds)
20 and below	3.5%
21 to 25	4%
26 to 35	5%
36 to 50	6%
51 to 65	7%
Above 65	9%

Table 2 Parks and Playgrounds Allocation Regulations for subdivisions according to PD 957.

Source: Presidential Decree No. 957, 1976

D. Green City Index

Green City Index (GCI) is a measurement or ranking system that assesses the environmental performance and sustainability of cities.[5] Asian Green City Index, a research project conducted by the Economic Intelligence Unit that was held in 2011, aims to measure the environmental performance of cities in Asia. Based on their report, Singapore is the top country to attain the highest score on overall performance based on the country's GCI. It is also noteworthy that during the assessment, the city of Manila Philippines scored below average.
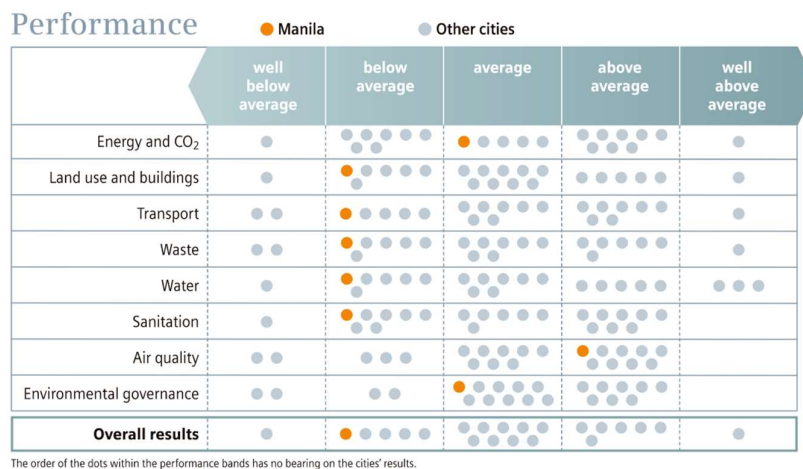
Fig. 2 Manila score based on 8 Categories of GCI. Data from A. Siemens, "Asian Green City Index Assessing the environmental performance of Asia's major cities," Siemens AG, 2011.

One of the key findings of Asian GCI is that wealth or government fund is still a dominant factor when it comes to environmental performance. Richer cities can make essential investments in urban development since they can afford to maintain a professional, experienced civil service to drive environmental initiatives[5]. This principle is evident in the Asian Green City Index, where more affluent urban centers consistently exhibit superior performance. For instance, Singapore exemplifies this trend as the frontrunner in the Index, boasting an exceptionally high overall ranking. Simultaneously, it stands as the fourth wealthiest city, with a GDP per capita of US$36,500. Consequently, it possesses the financial capacity to establish state-of-the-art water recycling facilities, waste to energy infrastructures, and substantial enhancements in its transportation network.[6]

Moreover, this is not a good excuse for the Philippines to rank below average. There are many ways to keep up with top-performing countries without relying purely on government funds. Manila City has relatively low score for its weak policies governing land use, green spaces and environmentally friendly infrastructures. The 5 square meters green spaces per person in Manila is below the index average which is 39 square meters.

E. Pocket Parks and Nature Access

Pocket parks, despite their small size, play a crucial role in providing essential access to nature for urban residents [8]These compact green spaces offer opportunities for people to connect with nature even in densely built urban areas, contributing to their overall well-being. Being close to the nature has been associated with numerous health benefits, including improved mood, reduced stress levels, and enhanced mental clarity[9] . Pocket parks serve as tranquil oases amidst the hustle and bustle of city life, offering a much-needed respite and connection to the natural world.

F. Cooling Effect

Urban parks provide substantial cooling effect, acting as a valuable tool in mitigating and reducing the urban heat island phenomenon [10]. The presence of vegetation, trees, and green spaces within parks helps reduce the overall temperature

in urban areas. Trees provide shade, lowering the ambient temperature and creating a more pleasant microclimate[11]. As a result, parks serve as cooling agents, providing a refuge from hot weather, and contributing to the comfort and well-being of park users. The cooling effect of parks is particularly beneficial during hot summer months when temperatures can soar in urban environments.

G. *Health and Well-being*
Urban community parks have a positive impact on residents' health and well-being, offering a range of physical, mental, and emotional benefits[12]. These parks provide opportunities for physical activities like walking, jogging, and recreational sports, promoting cardiovascular fitness, muscle strength, and overall physical health. Furthermore, the presence of greenery and natural elements in community parks has a calming effect on the mind, reducing stress, anxiety, and symptoms of depression. Time spent in these serene settings fosters a sense of tranquility and connection with nature, ultimately enhancing the mental well-being of park visitors.

H. *Quality of Life Improvement*
Parks, open spaces, or green areas in urban communities contribute to enhancing the overall environmental quality and quality of life for inhabitants[13]. The presence of well-designed and well-maintained parks adds aesthetic value to the cityscape, making it visually appealing and attractive to both residents and visitors. Access to green spaces provides opportunities for recreational activities, leisurely walks, and social interactions, enriching the community's cultural life and providing a space for diverse social gatherings. The availability of parks contributes to the overall livability and desirability of the neighborhood, positively impacting the residents' daily experiences and life satisfaction.

I. *Holistic Evaluation*
A comprehensive methodology for evaluating urban parks that integrates ecological, economic, and social aspects provides valuable insights into their multifaceted contributions to sustainability and well-being [14]. This holistic approach allows for a thorough understanding of the park's ecological benefits, such as its role in enhancing biodiversity, improving air quality, and reducing carbon emissions. Additionally, considering the economic aspects helps to assess the cost-effectiveness and return on investment of park development and maintenance. Furthermore, the evaluation of social aspects sheds light on the park's impact on community cohesion[15], social interactions, and overall quality of life for residents[16]. This comprehensive evaluation enables park managers and planners to make informed decisions, optimize park design and management strategies, and maximize the benefits that parks offer to urban communities.

1) Methods and Methodology:
This research was conducted in Cabanatuan City's CBD, Philippines, with 19 identified subdivisions. However, six of these subdivisions were non-operational. The study used both quantitative and qualitative data, including surveys and direct observations, to understand residents' satisfaction, usage patterns, and demographic variations in the subdivisions and Existing City parks. Comparative analysis was employed to identify factors affecting the usage pattern of public open spaces and recommend policies to improve the quality and accessibility.

Given the limited resources and varying populations in the subdivisions, the researcher opted for simple random sampling to distribute questionnaires. To determine the required number of participants per subdivision, an 80% confidence level and 15% margin of error were used. For instance, in Subdivision Kapitan Pepe Phase 1 with 2645 residents, the formula indicated that only 19 participants were needed to answer the questionnaire. This method allowed the researcher to achieve desirable results while minimizing the extensive labor required.

$$Sample\ size = 1 + (e2Nz2 \times p(1-p))e2z2 \times p(1-p)$$

Equation 1 Sampling Size Equation
For statistical treatment. The researcher used the mean score to rank Likert-scale data for analyzing utilization patterns across subdivisions. A smaller mean score indicated higher and more positive agreement levels from respondents. The Likert scale, a five-point scale, was employed to assess accessibility and utilization patterns of neighborhood parks in Cabanatuan City CBD. The Green City Index utilized indicators like the sum of public parks, waterways, greenways and other accessible protected areas per inhabitant in square meters.

3.1 Study Area
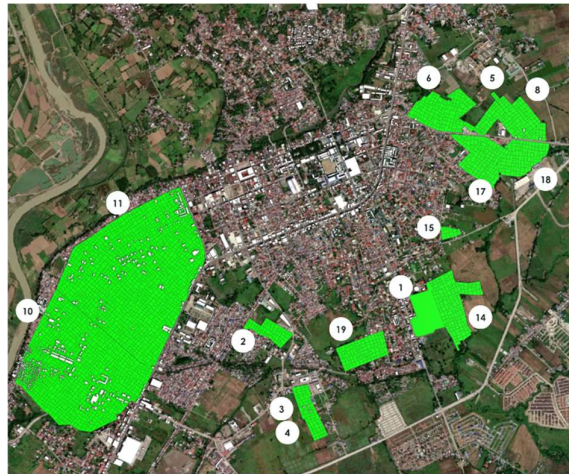
Fig. 3(19) Nineteen Subdivisions located in Cabanatuan City CBD

Fig. 4 Built-up area in Cabanatuan City CBD from 2003 (Left), 2012 (Middle), and 2023 (Right)

Cabanatuan City's built-up area has increased visibly from 2003 to 2023 as shown on the satellite images above. Based on Cabanatuan City Economic profile, there are only 304.38 hectares of built-up areas from year 2000 to 2010, but on the year 2010 to 2022 it has increased to 483.33 hectares.
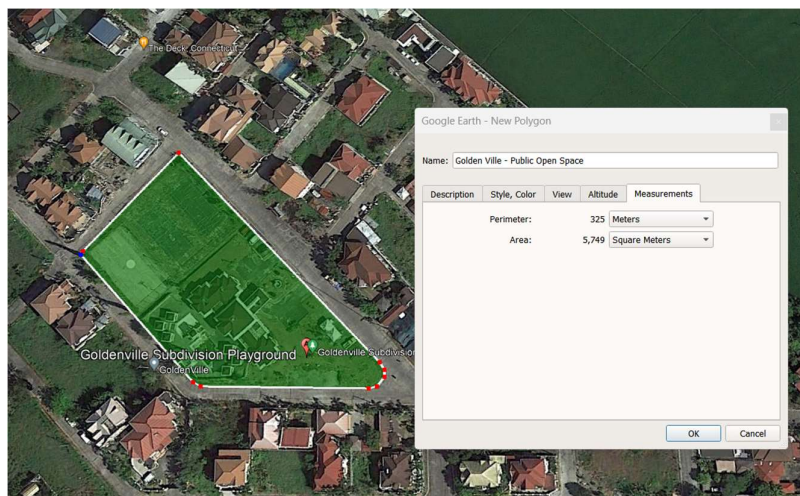
Fig. 5 Site Measurement through GIS using Google Earth

To measure the open space of each subdivision, the researcher formed a team and utilized tools like a Tape measure and laser meter. The researcher also employed GIS-based software, such as Google Maps and QGIS, to verify the on-site measurements. The polygon tool on Google Maps was used to trace the public open space identified during the interviews.

2) SUMMARY AND DISCUSSION
The researcher was presented with a valuable opportunity to conduct interviews with a considerable number of Homeowners Association presidents, which served as a critical aspect of the research process. The insights garnered from these interviews were anticipated to provide valuable perspectives and understanding of the association's dynamics and decision-making processes.

Despite the researcher's diligent efforts, certain challenges were encountered during the data collection phase. On specific occasions, no acting president was available for an interview, potentially due to scheduling constraints or leadership transitions within the associations. Furthermore, during the study, the researcher encountered restrictions in accessing data within the association premises in certain instances. These constraints may have resulted from privacy concerns, organizational policies, or other factors that limited the researcher's ability to directly gather certain information on-site.

Respondents per Subdivisions		
	N	%
Cecilia Village I	21	11.9%
Cecilia Village II	19	10.7%
Cecilia Village III	20	11.3%
De Guzman Village	18	10.2%
Kapitan Pepe Village	20	11.3%
Lorenville	19	10.7%
Olympia Village	20	11.3%
St. Nicholas Village	19	10.7%
Villa Luz	21	11.9%

Table 3 Number of Respondents per Subdivision

For survey questionnaires in Subdivisions, only nine (9) out of nineteen (19) subdivisions within Cabanatuan CBD responded. Two (2) Subdivisions did not return the papers, six (6) were no longer operating due to bankruptcy, and two (2) has restricted us from entering their premises. In most cases, the researcher was able to collect data on-site and gather valuable information through interviews and physical observation.

Demographic Data of Respondents					
	N	Min.	Max.	Mean	Std. Dev.
Gender	177	1.00	2.00	1.55	.50006
Age	177	1.00	5.00	3.20	1.04468
Tenancy Status	177	1.00	2.00	1.27	.44583

Table 4 Demographic Data of Respondents

N=No. of Respondents. Gender 1=Male, 2= Female. Age 1=Younger Respondents, 5=Elderly respondents. Tenancy Status 1=Owner, 2=Tenant.

A. Utilization Pattern of Respondents

Subdivisions	Q1	Q2	Q3	Q4	Q5	Q6	Q7
Cecilia Village I	1.71	2.71	2.28	2.09	2.28	2.57	1.09
Cecilia Village II	2.16	2.47	2.21	2.37	2.6	2.89	1.63
Cecilia Village III	1.75	2.30	1.75	2.05	2.05	2.50	1.30
De Guzman Village	5.00	5.00	5.00	5.00	5.00	5.00	1.06
Kapitan Pepe Village	2.20	2.25	2.25	2.30	2.00	2.70	1.30
Lorenville	2.89	3.16	2.84	3.05	2.26	4.00	1.05
Olympia Village	5.00	5.00	5.00	5.00	5.00	2.40	2.30
St. Nicholas Village	5.00	5.00	5.00	5.00	5.00	5.00	1.21
Villa Luz	4.09	4.05	4.14	4.19	4.00	4.76	1.19
Total	3.29	3.53	3.37	3.42	3.33	3.51	1.35

Table 5 Utilization Pattern of Respondents

Q1, Q2, Q3, Q4, and Q5 are questions that inquire about independent variables in the utilization pattern of parks. While Q6 and Q7 are general points of view of respondents on Parks. The researcher interpreted the data gathered using the Likert scale. For Q1 to Q5, the Value of the Likert scale is as follows: 1= Excellent, 2=Good, 3=Fair, 4=Poor, and 5=Unavailable. For Q6, the Value of the Likert scale is as follows: 1=Daily, 2=Weekly, 3=Monthly, 4=Rarely, and 5= Never. Meanwhile for Q7, the Value of the Likert scale is as follows: 1=Very Important, 2=Important, 3=Neutral, 4=Not Important, and 5=Not very important.

B. Q1 or Availability of POS.
Built environment features such as Public open spaces promote physical activities that is important to the wellbeing of the society. Thus, its availability is one of the significant factors to consider when it comes to analyzing the adequacy of POS on a city[17]. Some studies also indicated that preserving or improving the quality of available Public open space can be more effective strategy to promote cardiometabolic health than efforts to increase POS accessibility. [18]The overall average mean score is merely 3.2, suggesting that most neighborhood parks in Cabanatuan CBD are not available for use, and in many cases, they do not actually exist at all.

C. Q2 or Quality and Maintenance of POS.
Parks and other public open spaces should withstand the test of time. The quality and maintenance should be observed and properly manage to maximize its utility[19]. The total mean score average in this factor is only 3.5. This result indicates that the quality and maintenance of neighborhood parks in Cabanatuan CBD are below average. It is evident that most of the neighborhood parks that were visited and observed during the research period were not in good condition.

D. Q3 or Variety and Range of POS.
The overall average mean score is only 3.6, revealing a lack of variety and range of amenities in the neighborhood parks of Cabanatuan CBD. The analysis clearly shows that the subdivisions designed for middle to high-income families tend to offer a wide variety of amenities in their parks. On the other hand, the subdivisions under BP 220 or social housing programs do not meet the standard requirements for parks and are deficient in amenities.

E. Q4 or Accessibility of POS.
In some countries, neighborhood parks were usually designed to be easily accessible. It is commonly located at the center of the residential area and is walkable within just five minutes period. Despite receiving an average score of 3.4 in Q5, the neighborhood parks in Cabanatuan CBD are also easily accessible. However, the main issue leading to the below-average mean score is that most subdivisions lack clearly identified neighborhood parks.

F. Q5 or Safety and Security.
The overall average mean score is just 3.3, indicating that the safety and security of neighborhood parks in Cabanatuan CBD are below average. This aligns with the results from Q1 to Q4, which show that most parks are not properly maintained, suggesting that ensuring safety and security is not a top priority for the administrative bodies responsible for managing the subdivisions.

G. Q6 or Frequency of Use of Neighborhood parks and other POS.
The overall average mean score is 3.5, indicating that most residents do not frequently utilize their neighborhood parks or other public open spaces (POS). The results from Q1 to Q5 have significantly impacted this parameter. If the parks were genuinely available and appealing to the residents, the score in this parameter could be somewhat improved.

H. Q7 or Overall Importance of POS to the Residents.
The results in this parameter seem to contradict the answers provided in Q6. The average score in Q7 is 1.3 in total or greatly above average. This suggests that while the residents acknowledge the importance of parks and recreational amenities to their well-being, their motivation to visit and utilize the parks is extremely low.

I. Utilization Pattern based on Gender

Gender		Q1	Q2	Q3	Q4	Q5	Q6	Q7
Male	Mean	3.20	3.50	3.27	3.30	3.30	3.45	1.31
	N	82	82	82	82	82	82	82
Female	Mean	3.37	3.56	3.45	3.53	3.37	3.57	1.38
	N	95	95	95	95	95	95	95
Total	Mean	3.29	3.53	3.37	3.42	3.34	3.51	1.35
	N	177	177	177	177	177	177	177

Table 6 Utilization Pattern based on Gender

The mean score of utilization patterns between males and females is relatively similar. This indicates that there are no significant factors influencing their decisions to differ from each other. In other words, both genders tend to use the parks and recreational amenities in a similar manner, suggesting that their preferences and behaviors regarding park usage do not vary significantly based on gender.

4.3 Utilization Pattern Based on Age

Age		Q1	Q2	Q3	Q4	Q5	Q6	Q7
17 and below	Mean	2.00	2.00	2.00	2.00	2.00	1.00	1.00
	N	1	1	1	1	1	1	1
18-30	Mean	3.43	3.63	3.43	3.52	3.48	3.63	1.30
	N	54	54	54	54	54	54	54
31-45	Mean	3.54	3.75	3.68	3.66	3.62	3.54	1.41
	N	56	56	56	56	56	56	56
46-59	Mean	3.37	3.51	3.32	3.37	3.27	3.76	1.17
	N	41	41	41	41	41	41	41
60 and above	Mean	2.36	2.92	2.68	2.88	2.56	2.92	1.64
	N	25	25	25	25	25	25	25
Total	Mean	3.29	3.53	3.37	3.43	3.34	3.51	1.35
	N	177	177	177	177	177	177	177

Table 7 Utilization Pattern Based on Age

The utilization pattern of individuals aged 60 and above significantly differs from other age groups. This indicates that older individuals are somewhat more optimistic when it comes to assessing public open spaces (POS). However, senior citizens' scores are below average in Q7, which pertains to the importance of POS. This means that they do not view public open spaces as highly essential or significant despite being relatively optimistic about their utilization patterns.

J. Summary of Data and Public Open Space Result

Subdivisions	Area	Pop. Size	Density	No. of Housing Units	POS/Person per PD1216	POS/person - Actual
Camella Cabanatuan	10.1	1148.0	28.0	280.0	6.1	8.9
Cecilia Village I	4.9	743.0	37.0	181.0	4.6	3.0
Cecilia Village II	3.0	915.0	75.0	223.0	2.3	1.2
Cecilia Village III	2.8	398.0	35.0	97.0	4.9	4.2
Ciudad Real Subdivision	4.1	210.0	25.0	101.0	13.5	11.7
De Guzman Subdivision	12.4	880.0	14.0	176.0	4.9	.0
Freedom Home Association	.5	.0	.0	.0	.0	.0
Goldenville Subdivision Phase	10.2	463.3	11.0	113.0	7.7	15.1
Green Ville Sur HOA	.4	.0	.0	.0	.0	.0
Kapitan Pepe Subdivision I	79.3	2645.0	10.0	823.0	10.5	18.4

Kapitan Pepe Subdivision Phase	73.5	2150.0	9.0	647.0	12.0	8.2
Kevin Ville Subdivision	5.0	.0	.0	.0	.0	.0
Lakas Pag-kakaisa ng Bantug	.9	.0	.0	.0	.0	.0
Lorenville Subdivision	15.3	300.0	15.0	224.0	17.9	23.0
Olympia Village	2.4	250.0	29.0	70.0	6.7	.0
Samantha Homes	2.9	.0	.0	.0	.0	.0
St. Nicholas Subdivision	8.8	2404.0	64.0	563.0	2.6	.0
Sunrise Subdivision	10.1	.0	.0	.0	.0	.0
Villa Luz Subdivision	5.0	402.0	20.0	98.0	4.4	16.6
Total	**13.2**	**679.4**	**19.6**	**189.3**	**5.2**	**5.8**

Table 8 Summary of Data and Public Open Space

Based on the given information, there are 19 subdivisions in Cabanatuan CBD, and the average area of each subdivision is 13.2 hectares. The population density is approximately 679 residents per hectare, resulting in around 20 housing units per hectare.

To calculate the POS per person, the identified POS (public open spaces) during site visits and interviews were measured, and then divided by the population size. The mean score for POS per person is 5.8 square meters.

Comparing this value (5.8 sqm) with the computation based on PD 1216, it appears that the POS per person is higher than what would be expected following the guidelines of Open space law. PD 1216 is a Philippine law that provides standards for open spaces in residential subdivisions, and it typically prescribes larger areas for public open spaces per person than what is being observed in Cabanatuan CBD based on the data provided.

It is worth noting that the actual appropriateness of the POS per person can be subjective and may depend on various factors, including local urban planning policies and the preferences of the residents. The higher POS per person observed could be seen as a positive aspect, offering more open space availability to the residents. However, it is essential to consider the specific context and the urban planning regulations in place to ensure that the open space provisions meet the needs and well-being of the community.

K. Status of Subdivisions
Apparently, six out of the nineteen subdivisions were no longer operating. According to interviews with residents from Sunrise, Greenville, and Samantha Homes, their developers were embroiled in a conflict that eventually led to bankruptcy. Furthermore, we encountered difficulties in obtaining relevant data for Freedom Homeowners, KevinVille, and Lakas Pagkakaisa subdivisions as we were unable to locate them on-site. Despite asking nearby residents in the area, they were also unaware of the existence of these subdivisions.

L. POS Availability
Out of the 19 subdivisions, only 10 have open space available. Among these 10, it is evident that 6 are non-operational so limited data has been gathered. Additionally, the remaining 3 subdivisions have been identified as having no open space available within their premises.

M. Comparative Analysis of Mean Score
Among the subdivisions with public open spaces (POS), Cecilla Village 1 has the lowest mean score for POS per person, with only 1.2 square meters of POS per person. On the other hand, Loren Ville Subdivision has the highest mean score for POS, with 23 square meters of POS per person. This indicates a significant difference in the amount of open space available per person between these two subdivisions.

When calculating the mean score of POS per person for the thirteen operating subdivisions, the result is 8.4 square meters of POS per person. Considering only the ten subdivisions with existing open spaces, the mean score increases to 11 square meters of POS per person. However, when deriving the mean score of POS per person for all nineteen

subdivisions, the score drops to only 5.8 square meters of POS per person. This is because some of the subdivisions do not have any existing public open spaces on their premises, leading to a lower overall average for the entire set of subdivisions.

These results highlight the importance of considering the presence of open spaces in each subdivision when calculating the average POS per person, as the inclusion or exclusion of subdivisions without open spaces can significantly impact the overall mean score.

4) CONCLUSION

In conclusion, the study on the availability, accessibility, and utilization patterns of parks and neighborhood parks in residential subdivisions located in Cabanatuan CBD has provided valuable insights into the state of public open spaces in the area. Through the survey questionnaires and comparative analysis, several key findings have been highlighted.

The presence of open spaces varies among the subdivisions, with 10 out of 19 having such spaces available. Among the subdivisions with open spaces, there is a notable difference in the mean scores of POS per person, ranging from a low of 1.2 sqm per person in Cecilla Village 1 to a high of 23 sqm per person in Loren Ville Subdivision.

The research has also shed light on the challenges faced in some non-operational subdivisions, particularly those impacted by developer conflicts and bankruptcy. Moreover, certain subdivisions, like Freedom Homeowners and Lakas Pagkakaisa, were not locatable on site, raising concerns about their existence and accessibility.

The findings underscore the significance of open spaces in residential subdivisions and their potential impact on residents' well-being and quality of life. It is evident that open space availability, accessibility, and utilization patterns play a crucial role in shaping residents' preferences and behaviors toward these spaces.

Considering these findings, several recommendations have been proposed to improve the situation. These include increasing open space availability in subdivisions without existing spaces, enhancing the utilization of open spaces in subdivisions with existing facilities, addressing bankruptcy and conflict issues in non-operational subdivisions, promoting awareness about specific subdivisions, and ensuring inclusive and community-driven planning for open spaces.

Ultimately, addressing these recommendations can contribute to a more vibrant, sustainable, and harmonious living environment in Cabanatuan CBD. By prioritizing the development and management of public open spaces and fostering community engagement, urban planners and policymakers can create a conducive atmosphere that encourages residents to actively use and enjoy these essential recreational areas.

Overall, the study serves as a valuable resource for guiding future urban planning efforts in Cabanatuan CBD and other similar contexts, with the goal of creating livable and thriving communities centered around accessible and well-utilized public open spaces.

8) REFERENCES

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