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Research Article

Determining factors in the relationship between sustainability and municipal management of public recreational spaces in Northeastern Peru

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Abstract:

The objective of study was identifying factors determine relationship between strategies implemented by municipal management and their impact on sustainability of public recreational spaces. The research was carried out in Tarapoto, Peru in 2020. The sample consisted of 384 people, including architects, municipal officials, and Tarapoto residents. Surveys were conducted through written questionnaires to determine if the strategies implemented by the municipal management improve the recreational public spaces sustainability. The independent variable was the strategies implemented by the municipal management, described by 9 dimensions: institutionalist, territorial programs, social control, access to information, accountability, spatial relationship, resource allocation, technology and communication, and project execution. The dependent variable was the public spaces sustainability, defined by 6 dimensions: design and equipment, accessibility, safety, environmental quality, comfort and social appropriation. It was determined that the strategies implemented by the municipal management significantly improve ($p < 0.01$) the recreational public spaces sustainability in Tarapoto through a correlation by ranges $\rho = 0.935$ and a determination coefficient $R2 = 0.938$, suggesting that 93.8% of the variation in the recreational public spaces sustainability is explained by the strategies implemented by the municipal management. It was estimated that the implemented strategies level by municipal management is regularly efficient in 66.67% and the sustainability of recreational public spaces in Tarapoto is good in 63.54%.It was possible identify the dimensions institutional, social control, allocation of resources, access to information and spatial relationship, as well as accessibility, design and equipment and security, as determinants for study of relationship between municipal management and sustainability indicators of public recreational spaces.

Keywords: municipal management, sustainability, recreational public spaces.

INTRODUCTION

In a context of accelerated population growth and cities urbanization, policies and management instruments that focus on the public spaces treatment have been put aside. Added to this are the high levels of pollution and congestion that appear as one of the main negative externalities of this population growth. According to Talancha (2013) public spaces, especially those with a large green areas number, could compensate or mitigate the effects of this problem. However, their number is insufficient, their management is deficient and their quality as public spaces is debatable. It is a global trend that many world cities through their governments allocate funds to improve and expand their public spaces, as it has been shown that this raises the life quality. For his part, Soto (2010) points out that there are multiple experiences at the international level, and specifically in Latin America, that provide solutions to current urban problems, based on intervention in public space, mainly in those neighborhoods that have emerged from informality, and that little by little have gone through an urban consolidation process, or in those that, despite having been conceived within formality, have been urban and social degradation victims. The Comprehensive Urban Projects in Medellín, Colombia, the Quiero Mi Barrio program in Chile and the Public Spaces Rescue Program in Mexico, are three examples of strategies carried out with different results, in which through physical intervention in the objective of public space is to improve both the urban conditions of those sectors that benefit from the actions carried out in them, as well as the public security situation. The quantity and quality of public spaces in the city have an impact on the citizen life quality of the citizen, so with its optimal management an adequate social integration is created (Jiménez, 2014).

In Peru, squares and other public spaces components have become conflict authentic areas for the development of various intentions; These spaces have become a true reflection of the collective identities construction within Peruvian society. Thus, the new zoning changes double the occupancy capacity, and can occur in less than 5 years in a country where the infrastructures are changed every 40 years, not to mention that they are obsolete and that, in many cases, they lack areas green. The traditional public space is now perceived as a dangerous and unsafe place, motivating the population to take shelter in private spaces that are increasingly hermetic and closed or private spaces of a collective nature that give an opposite image and with a concept of limited freedom.

Public spaces in general and recreational spaces in particular in Tarapoto, reveal a high degree deterioration, dirt and lack of architectural elements and inequity conditions, lack of economic growth and poverty suffered by its inhabitants. Currently, in Tarapoto, there are 06 playgrounds, 02 squares, 05 squares, 08 central planters, 51 lateral planters, 04 avenues, 01 Boulevard and 03 stairways. Making a total of 80 green areas which total 85,172.43 m2 located in the various neighborhoods of Tarapoto. But, at the same time, it has a potential for natural remnants that can be attached to the public recreational spaces system of the city, that is, in recent years the city has had significant urban and marginal urban growth, without proper planning, originating a disorder and an inadequate management of public spaces and especially those that correspond to recreational public spaces. In this sense, the general objective of this research is to determine if the strategies implemented by municipal management improve the recreational public spaces sustainability in Tarapoto, 2020, for which it is intended to identify the level of strategies implemented by the municipal management, the sustainability level of recreational public spaces, determine if the strategies implemented by municipal management regarding institutionality, social control, access to information, accountability, spatial relationship, resource allocation, technology and communication, improve the sustainability of recreational public spaces, project execution, design and equipment, accessibility, safety, environmental quality, comfort and social appropriation improve the sustainability of recreational public spaces in Tarapoto, 2020.

METHODOLOGY

The investigation was carried out in Tarapoto, Peru. The population was made up of architects, municipal officials and residents of Tarapoto, 2020. Table 1 shows the population distribution. The sample consisted of 384 people, including architects, municipal officials, and residents of Tarapoto (Table 2). Surveys were conducted through written questionnaires to determine if the strategies implemented by the municipal management improve the sustainability of recreational public spaces. The questionnaire referring to the independent variable (Strategies implemented by municipal management) was made up of 9 dimensions: institutionalist, territorial programs, social control, access to information, accountability, spatial relationship, resource allocation, technology and communication and execution of projects; with a total of 52 items. Likewise, the questionnaire referring to the dependent variable (public spaces sustainability), was made up of 6 dimensions: design and equipment, accessibility, safety, environmental quality, comfort and social appropriation; with a total of 36 items.

Table 1. Distribution of architects' population, municipal officials and residents of Tarapoto, 2020.

Condition	Gender		Total
	Men	Women	
Workers	40	32	72
Architects	279	200	479
Citizens	63 087	94 632	157 719
Total	63 406	944 864	158 270

Source: San Martín Regional College of Architects (2018) / Provincial Municipality of San Martín / INEI (2017).

Table 2. Distribution of architects' sample, municipal officials and residents of Tarapoto, 2020.

Condition	Gender		Total
	Men	Women	
Workers	10	10	20
Architects	18	12	30
Citizens	177	157	334
Total	205	179	384

Source: San Martín Regional College of Architects (2018) / Provincial Municipality of San Martín / INEI (2017).

Descriptive statistics were used to evaluate behavior of variables and their dimensions. Similarly, for analysis of relationship between strategies implemented by municipal management and sustainability indicators of public recreational spaces, Spearman's correlation by ranks factor analysis were used for details (Montoya, 2007).

RESULTS AND DISCUSSION

Table 3 shows 66.67% of the architects, municipal officials and Tarapoto residents consider an efficient level of the strategies implemented by the municipal management, while 27.08% consider a regularly efficient level, and 6.25% consider a deficient level. Consequently, it is identified that the strategies implemented by the municipal management in Tarapoto have a predominantly efficient level. Results that can be compared with the Boscán research (2019), who concludes that sustainable urban management, linked to institutional strategic processes, makes cities the space for adaptation to such changes and complexities.

Table 3. Strategy levels implemented by municipal management in Tarapoto, 2020.

Levels	Implemented strategies	
	f	%
Very poor	0	0.00
Deficient	24	6.25
Regularly efficient	104	27.08
Efficient	256	66.67
Very efficient	0	0.00
Total	384	100

Table 4 shows the level with the highest prevalence is the efficient level, obtaining 45.05% in the institutional dimension, 42.45% in territorial programs, 62.76% in social control, 47.14% in access to information, 49.74% in accountability, 63.28% in spatial relation, 53.13% in resource allocation, 48.70% in technology and communication, and 56.77% in project execution. These results can be compared by research of Molina (2018), who concluded that public policy aimed at satisfying social requirements has been shaping the scenario of comprehensive well-being in people.

Table 4. Dimension levels of the strategies implemented by municipal management in Tarapoto, 2020

Levels		Very poor	Deficient	Regularly efficient	Efficient	Very efficient	Total
Institutionality	f	0	39	140	173	32	384
	%	0.00	10.16	36.46	45.05	8.33	100
Territorial programs	f	0	60	143	163	18	384
	%	0.00	15.63	37.24	42.45	4.69	100

Social control	f	0	59	84	241	0	384
	%	0.00	15.36	21.88	62.76	0.00	100
Access to information	f	0	48	106	181	49	384
	%	0.00	12.50	27.60	47.14	12.76	100
Accountability	f	15	70	99	191	9	384
	%	3.91	18.23	25.78	49.74	2.34	100
Spatial relationship	f	0	37	78	243	26	384
	%	0.00	9.64	20.31	63.28	6.77	100
Resource allocation	f	0	54	110	204	16	384
	%	0.00	14.06	28.65	53.13	4.17	100
Technology and communication	f	0	53	130	187	14	384
	%	0.00	13.80	33.85	48.70	3.65	100
Projects execution	f	0	14	118	218	34	384
	%	0.00	3.65	30.73	56.77	8.85	100

Table 5 shows 63.54% of architects, municipal officials and residents of Tarapoto consider a good sustainability level of recreational public spaces in Tarapoto, while 23.18% consider a regular level, 7.03% a very good level and 6.25% a bad level. Consequently, it is identified sustainability of recreational public spaces in Tarapoto has a predominantly good level. These results can be compared with research by García (2017), who concluded that urban planning and planning projects and instruments with their different names depending on system regulated by each country or region: general, partial, territorial planning, intercommunal plans , regional, sectional, etc., and above all those that define the public space design as a mechanism for urban sustainability, open space projects, urbanization and like are eminently managed under local governance criteria.

Table 5. Sustainability levels of recreational public spaces in Tarapoto, 2020

Levels	Public-recreational spaces sustainability	
	f	%
Very bad	0	0.00
Bad	24	6.25
Regular	89	23.18
Good	244	63.54
Very good	27	7.03
Total	384	100

Table 6 shows the level with the highest prevalence is the good level, obtaining 46.88% in the design and equipment dimension, 42.97% in accessibility, 54.95% in safety, 43.49% in environmental quality, and comfort. 56.25% and 42.19% in social appropriation. Results that are related to study by Pérez (2016), who concluded characteristics of urban centers, in addition to potential they have for the paradigms incorporation of sustainable criteria, allow defining a comprehensive planning model based on regeneration and evolution of public spaces. Likewise, it is observed that 57.8% of architects, municipal officials and residents of Tarapoto consider strategies implemented by municipal management are efficient and sustainability of recreational public spaces is good. On the other hand, results shown in Table 7 suggest strategies implemented by municipal management

significantly improve ($p < 0.01$) sustainability of recreational public spaces in Tarapoto. In that order, it is observed the adjustment coefficient ($R2 = 0.938$) suggests 93.8% of variation on recreational public spaces sustainability is explained by strategies implemented by municipal management. These results can be compared with research of Schroeder and Torres (2020), who conclude different actions have been carried out such as collaborative analysis activities, participatory design workshops with citizens, mapping, strategies to promote local identity and awareness about public spaces and implementation of parks with the involvement of population.

On the other hand, Table 7 shows architects, municipal officials and residents of Tarapoto consider the strategies implemented by municipal management through social control, design and equipment, accessibility and safety are efficient and sustainability recreational public spaces is good, with which it is evidenced that said strategies implemented by municipal management significantly improve sustainability of recreational public spaces in Tarapoto, 2020. These results can be complemented with research of Mendoza (2019), who concludes urban environmental factors of public spaces significantly influence collective social self-esteem of population of the Human Settlement Laura Caller of Los Olivos. Therefore, it is specified if urban environmental factors are improved and public spaces are better used, collective social self-esteem of population of the Human Settlement Laura Caller will be improved. Likewise, such results can be supported by theory on humanization of public space, where it is considered essential that, when designing the city, the influence it produces on social life is not lost sight of: The physical framework can influence to a greater or lesser extent in the social situation of inhabitants. The physical frame itself can be designed so that desirable forms of contact are hampered or even impossible. Architecture can literally be an obstacle to desirable activity patterns. Therefore, the urban planning paradigm of Gehl (2014) can be understood as a reaction to the primacy that modern functionalism gave to the construction of roads and highways for automobiles as a synonym of progress for cities and that they forgot to human scale.

In relation to design and equipment in the sustainability of recreational public spaces, according to Acosta (1993) they constitute a captivating activity that, like architectural design, implies need for artistic sensitivity, social awareness and technical capacity. That is why adequate proposal of urban design contributes not only to the execution of public or private works of high aesthetic and constructive quality, but to extent that the constituent elements of the same are contemplated, which necessarily implies the existence of, as Acosta proposes well, of harmony between the link between artistic sensitivity, social conscience and obviously the technical capacity that will allow to raise the constructive quality of the design. The homogeneity in type of constructions, heights, materials, colors, etc., of buildings produces a monotonous, tired urban landscape that is unlikely to be retained in our memory.

On the other hand, Castro (2011) points out accessibility is an indicator of distance that separates an inhabitant of city from the places where he can satisfy his needs, in such a way that accessibility has an impact on life quality of its inhabitants, understood as the satisfaction degree of population essential needs: health, housing, food, work, income, etc. as well as other needs related to their social and physical environment, such as their political participation, cultural and leisure activities, among others. The phenomenon of accessibility is interrelated with urban planning, infrastructures and equipment, which should ensure a universal accessibility condition, free of physical and social barriers that constitute most autonomous and natural way possible.

In relation to safety in public recreational spaces sustainability, results obtained can be compared with Jiménez (2014), who points out in sustainability of public recreational spaces it must have good maintenance, control, administration and promote citizen participation as main actor for the achievement of a sustainable public space. In addition, it is an opportunity to strengthen citizenship. It contributes to improving distribution, articulation, access, identity, use frequency, power, of public spaces, developing self-esteem and social relationships, improving urban life. Being one of municipal management objectives in addition to civic rights (housing,

education, health, etc.) urban rights, through development of policies and public spaces projects, being able to co-finance them with other administrations.

Table 6. Dimension levels of recreational public spaces sustainability in the Tarapoto, 2020

Levels	Design and equipment		Accessibility		Safety		Environmental quality		Comfort		Social appropriation	
	f	%	f	%	f	%	f	%	f	%	f	%
Very bad	16	4.17	8	2.08	31	8.07	24	6.25	15	3.91	18	4.69
Bad	45	11.72	60	15.63	39	10.16	61	15.89	30	7.81	38	9.90
Regular	107	27.86	142	36.98	69	17.97	107	27.86	52	13.54	51	13.28
Good	180	46.88	165	42.97	211	54.95	167	43.49	216	56.25	115	29.95
Very good	36	9.38	9	2.34	34	8.85	25	6.51	71	18.49	162	42.19
Total	384	100	384	100	384	100	384	100	384	100	384	100

Table 7. Strategies implemented by municipal management and sustainability indicators of recreational public spaces in Tarapoto, 2020

Municipal management strategies	Recreational public spaces sustainability		
	Spearman rank correlation		Determination coefficient
	Coefficient	P value	
	0.935	0.000	0.938
Dimension			
Institutionality	0.692	0.000	0.591
Territorial programs	0.589	0.000	0.561
Social control	0.680	0.000	0.646
Access to information	0.619	0.000	0.448
Accountability	0.589	0.000	0.457
Spatial relationship	0.612	0.000	0.332
Resource allocation	0.653	0.000	0.585
Technology and communication	0.585	0.000	0.501
Projects execution	0.478	0.000	0.465
Design and equipment	0.703	0.000	0.677
Accessibility	0.724	0.000	0.699
Safety	0.684	0.000	0.688
Environmental quality	0.511	0.000	0.353
Comfort	0.447	0.000	0.186
Social appropriation	0.474	0.000	0.303

Through factor analysis it was possible reduce number of original dimensions (2 dimensions), which together explain 75.20% of variability in relationship between strategies implemented by municipal management and sustainability indicators of recreational public spaces in Tarapoto City, 2020, which includes dimensions institutional, social control, allocation of resources, access to information and spatial relationship, as well as accessibility, design and equipment and security, which are decisive for study of relationship between municipal management and sustainability indicators of public recreational spaces in Tarapoto, 2020 (Table 8).

Table 8. Factors determining relationship between strategies implemented by municipal management and indicators of sustainability of public recreational spaces in Tarapoto, 2020.

Factor 1	Factor 2
Institutionality	Accessibility
Social control	Design and equipment
Resource allocation	Safety
Access to information	
Relación espacial	
Explained variance=59,20%	Explained variance=28,00%

FINAL CONSIDERATIONS

Se identificó que las estrategias implementadas por la gestión municipal en la ciudad de Tarapoto tienen un nivel predominantemente eficiente. Se identificó que la sostenibilidad de espacios públicos recreativos en la ciudad de Tarapoto tiene un nivel predominantemente bueno. Finalmente, se observa que los arquitectos, funcionarios municipales y pobladores de la ciudad de Tarapoto consideran que las estrategias implementadas por la gestión municipal a través del control social, diseño y equipamiento, accesibilidad y seguridad son eficientes y la sostenibilidad de espacios públicos recreativos es buena, con lo cual se evidencia que dichas estrategias implementadas por la gestión municipal mejoran significativamente la sostenibilidad de espacios públicos recreativos en la ciudad de Tarapoto en el 2020. Finally, it was possible identify dimensions institutional, social control, resource allocation, access to information and spatial relationship, as well as accessibility, design and equipment and security, as determinants for study of relationship between municipal management and indicators of sustainability of public recreational spaces.

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