

Territorial Diagnosis and Urban Sustainability Challenges in Consolidated Mixed-Use Districts: A Case Study of Kennedy Norte, Guayaquil

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Abstract— The territorial diagnosis of the North Kennedy Citadel was developed with the aim of characterizing its current state through the analysis of five subsystems: biophysical, sociocultural, economic, human settlements and political-institutional. This area, located in the Tarqui parish of the Guayaquil canton, has a flat relief, humid tropical climate and a vegetation cover of less than 15%, affected by urban expansion. Problems such as the loss of green spaces, flood risks, traffic congestion, commercial pressure on residential land and low citizen participation were identified. Despite this, the sector has potentialities such as its strategic location, consolidated infrastructure, presence of public and private actors, and underutilized territorial resources. The methodology used was mixed, combining direct observation, informal interviews, normative analysis and statistical data processing. This diagnosis constitutes a technical basis for the design of the Partial Plan, in accordance with the cantonal PDOT and the current legal frameworks (COOTAD, LOOTUGS). It is concluded that Kennedy Norte requires a planned intervention that articulates sustainability, participation and territorial planning, allowing to move towards a more balanced and resilient model.

Keywords: Territorial planning, urban planning, environmental diagnosis, territorial sustainability, territorial management.

INTRODUCTION

Kennedy Norte

The Kennedy Norte Citadel located specifically in the Tarqui parish within Guayaquil represents one of the most consolidated urban sectors of the city, approximately has a proportion of at least 3km of hectares, it is made up of a flat and characteristic relief in the coastal plain. It has a strategic mixed-use node thus counting on residential and economic activities. For its location, it is delimited by main avenues such as Juan Tanca Marengo and Francisco de Orellana. Territorial planning currently prioritizes and allows the urban growth of a city to be organized efficiently and exemplified, therefore it is based on modernization and sustainability to face challenges such as urban disorder or inequality, changes in basic services by increasing areas,

environmental risks that cause the loss or absence of green spaces and the consecutive deterioration of climate change, which would affect more consolidated sectors such as Kennedy Norte.

In order to obtain a good territorial planning, it is proposed to identify the public policies known to regulate the use of land in the selected sector, which could reduce the socio-spatial and sustainable conflicts that arise in the long term. In Guayaquil, the Buen Vivir-Sumak Kawsay regulations incorporated in the Constitution of Ecuador affirm that territorial and sustainability facilities are produced as solid instruments for good urban legalization, taking into account all environmental areas in each sector.

Through the Development and Territorial Planning Plan PDOT is defined as a technical and regulatory instrument that guides the development of autonomous governments that as its development constitutes a tool applied to the territory that needs to be regulated, as in this case Kennedy Norte, residential use and traffic congestion increase in its path, which would be one of the problems of great importance. it is necessary to build a current territorial model in order to move forward with its planning.

Importance of territorial diagnoses in sustainable urban planning

Within the framework of sustainable urban planning, territorial diagnoses make it possible to anticipate conflicts, guide land management and guarantee the quality of life of the population. In Ecuador, this process is regulated by instruments such as the Organic Code of Territorial Organization, Autonomy and Decentralization (COOTAD), which grants powers to decentralized autonomous governments to formulate development and planning plans; the Organic Law on Territorial Planning, Land Use and Management (LOOTUGS, 2016), which regulates land use with criteria of sustainability and spatial justice; and the Development and Territorial Planning Plans (PDOT), which constitute the technical and regulatory tool to guide urban growth in the medium and long term.

General Objective

The present research work proposes to develop a Territorial Diagnosis in Kennedy Norte by presenting problems such as unconsolidated infrastructures or a strategy not linked to connectivity within the city of Guayaquil, therefore this diagnosis constitutes having a Partial Plan that represents a significant phase in this sector and by taking into account its planning we can understand that the general objective of this work is to build a territorial model through the analysis of its subsystems in order to specifically delimit the area to be intervened.

MATERIALS AND METHODS

Research Focus

The focus of this research is based on a mixed use or methodology, since it specifically integrates quantitative and qualitative analysis, which is exemplified in territorial diagnoses such as field observation, formal interviews and a photographic record of the site to be studied, on the other hand, in the quantitative approach it will be elaborated with statistical data that specify one by one the regulations used to identify the current state of the territory.

Study Area

The study area allows us to identify Kennedy Norte as a citadel located specifically in the city of Guayaquil with an area of 3km and a high flat relief thanks to its main roads and the use of public transport in this territory.



Figure 1 Delimitation of the area

Kennedy Norte

The Kennedy Norte Citadel is located in the Tarqui parish of the Guayaquil canton, Guayas province. It has an approximate extension of 3 km² and is located at an average altitude of 5 to 10 meters above sea level.

Geographical Boundaries

North: Av. Juan Tanca Marengo limitando con Av. Luis Plaza Dañín.

South: Av. Francisco de Orellana y Ciudadela Universitaria

East: Av. Miguel H. Alcívar junto al Estadio Modelo y Hospital de la Policía.

West: Av. Joaquín Orrantía, Estero Salado

The main access roads in the Cdla. Kennedy Norte son la Av. Francisco de Orellana, Av. Juan Tanca Marengo, Av. Joaquín Orrantía y Av. Miguel H. Alcívar who have public transportation, operating systems such as taxis and even has access to several stations/stops near the Metrovía (Trunk 2). Figure 3. Boundary map of the area

BIOFISICO	clima, relieve, hidrografía, cobertura vegetal y riesgos naturales.
SOCIOCULTURAL	población, demografía, educación, cultura y seguridad.
ECONOMICO	actividades económicas, empleo, ingresos y estructura productiva.
ASENTAMIENTOS HUMANOS	vivienda, densidad, consolidación urbana y servicios básicos.
POLITICO INSTITUCIONAL	instituciones públicas, normativa vigente y participación ciudadana.

Table 1 Subsystems to use

Analysis Tools

In this research work, various tools such as Google Earth Pro will be implemented to delimit zones or areas studied for better territorial planning, some of which can be chosen and analyzed by means of statistical data or graphs used in Microsoft Excel and finally a matrix which will provide information on causes, effects and the subsystems used.

RESULTS

Result of the Subsystems Used

The territorial analysis carried out in the North Kennedy Citadel facilitated a broader understanding of the functioning of this area from different territorial perspectives. Each of the subsystems studied showed specific features, in addition to problems that have been accumulating in recent years due to the dizzying pace of urbanization in the region. However, opportunities have also arisen that can be taken advantage of as long as there is adequate planning and articulated public management.

Physicobiotic Diagnosis

The area presented a flat relief, with elevations that ranged between 5 and 10 meters above sea level, typical of the Guayaquil coastal plain. The climate was humid tropical, with an average annual temperature of 24 °C to 28 °C and an average rainfall close to 1,200 mm/year, mainly concentrated between the months of January and April.

The hydrography was determined by the presence of the Estero Salado, which is the main body of water in contact with the study area. The soils were predominantly alluvial, with high waterproofing due to intensive urbanization. Vegetation cover was reduced to less than 15% of the territory, distributed in remaining green areas and small urban parks. Among the most relevant natural hazards were urban flooding due to deficiency in storm drainage and the urban heat island derived from the loss of vegetation.

Problems Identified

Loss of vegetation cover: Approximately 85% of the territory was occupied by buildings and pavement, which significantly reduced the absorption capacity of the soil. The disappearance of community green areas and their replacement by commercial buildings was observed.

Potential

Recovery of green areas: There are approximately 45 hectares of underutilized spaces that can be formalized as urban parks and ecological corridors, contributing to improving environmental and social quality.

Use of the Estero Salado: The territory has an estuarine edge that, under proper environmental management, allows the development of ecological regeneration projects and public spaces for community integration.



Figure 2 Land Use and Occupation Map

Sociocultural Subsystem

Kennedy Norte is distinguished by having a varied and predominantly young adult community, which moves daily for work, business and service reasons. This situation means that the area has a stable population and a transitory one, which increases the activity of the area during working hours. The academic level in general terms was medium to high thanks to the existence of private and professional centers that carry out their work in offices, clinics and establishments in the sector.

Despite the fact that the socioeconomic status is quite good, sectors in vulnerable conditions related to informal work also coexisted. In terms of the social sphere, the community lacks a strong neighbourhood structure, and the links between residents tend to be more related to the practical use of space than to community interactions. Safety turned out to be one of the aspects most pointed out by those who live and work there.



Figure 2 Land Use and Occupation Map

1. C.C. Mall Del Sol, Edif. Nobis, Omnihospital, Hotel Howard Jhonson
2. Airport Jose Joaquin De Olmedo Y Hosp. San Francisco
3. U. Laica Vicente Rocafuerte, Colegio Aguirre Abad, Hosp. De La Policia Y Estadio Modelo
4. C.C. San Marino, Hotel Marriot
5. Universidad Catolica, Parque Lineal.

Problems Identified

- Perception of insecurity: Thefts, robberies, and destruction were reported in commercial areas, particularly during periods with little influx of people.
- Informal commerce on the rise: The presence of street vendors generates conflicts on sidewalks, hinders pedestrian traffic and affects the order of public space.
- Limited community organization: The lack of neighborhood councils limits the possibility of jointly managing the difficulties of the area.

Potential

- Young and educated population: There is capacity to promote entrepreneurship, training and citizen participation programs.
- Active business community: Companies located in the area have the possibility of participating in urban renewal or security initiatives.
- Proximity to educational, recreational and cultural facilities: This allows strengthening social integration activities.

Economic Subsystem

Kennedy Norte is a key economic point in the north of Guayaquil. It houses private clinics, service offices, shops, restaurants, hotels and companies of different sectors. The economy of the sector is mainly driven by specialized services, health, gastronomy and formal trade activities. Being a consolidated sector, income levels are usually higher than the average of other areas of the canton.

However, it was observed that the territory depends on very specific activities, which can be a risk if an economic crisis occurs. There is also a mix of formal and informal employment, especially in small businesses.

Problems Identified

- Dependence on a few economic sectors: If health services, offices or formal commerce are affected, the local economy will also be affected.
- Job insecurity in small businesses: Many employees lack employment contracts and benefits.
- Orderless commercial growth: The constant opening of businesses has generated saturation of roads and sidewalks.

Potential

- Strategic location: The connection with main avenues favors the attraction of investment.
- Consolidated business base: There are requirements for establishing new economic clusters or innovative zones.
- Possibility of diversifying activities: The sector can incorporate coworking, technology centres or creative services.

Human Settlements Subsystem

Kennedy Norte is a fully consolidated settlement, with modern buildings of medium and high rise. Traditional homes have been transformed to adapt to commercial use, which has changed the residential identity of the sector. Basic services are available, although storm drainage showed capacity problems.

The street furniture fulfills its function, although it is insufficient for the volume of people who pass through daily. The lack of appropriate public spaces and considerable green areas was one of the most problematic aspects within this subsystem.

Problems Identified

- Deficit of public spaces: There are not enough parks, squares or green areas for community use.
- Flooding in the rainy season: The capacity of the rainwater drainage is insufficient, which causes frequent accumulations of water.
- Excessive transformation of residential use: Homes converted into offices reduce the quality of life and increase traffic.

Potential

- Empty or underused lots: They can be used to implement new public spaces.
- Good road connectivity: It facilitates sustainable mobility initiatives and improved transport.
- Consolidated infrastructure: The sector has adequate conditions for urban renewal projects.



Figure 3 Map of Urban Facilities

Political-Institutional Subsystem

Kennedy Norte has public entities such as the UPC, municipal offices, schools and health centers. According to the PDOT, the zone is defined as a consolidated mixed-use area, allowing for the coexistence of residential, commercial, and service functions in accordance with certain regulations. However, organized community participation is low, making it difficult to follow ordinances or manage collective issues. In addition, the inspection of public space and buildings is limited.

Problems Identified

- Partial non-compliance with municipal ordinances: It is warned that the constructions do not comply with the withdrawals, heights or authorized uses.
- Insufficient oversight: Control is activated only when there are citizen complaints.
- Low community participation: There are no active neighborhood boards that support the management of the territory.

Potential

- Institutional recognition of the sector: PDOT considers Kennedy Norte as a strategic area.
- Existence of local actors interested in improvements: Social organization can be promoted.
- Extensive public and private presence: Allows alliances for urban projects of impact.

DISCUSSION

Integrated Problem Matrix

Table 2 Cause and Effect Matrix

Problem	Root Cause	Territorial Effect	Subsystem(s)
Urban flooding	Insufficient drainage, waterproofing added to heavy rains.	Damage to homes, limited mobility, road deterioration.	Biophysical and Infrastructure.
Regulatory non-compliance	Lack of oversight and ignorance of ordinances.	Road saturation, occupation of public space.	Political-collective and Settlements.
Disorderly informal trade	Economic pressure and lack of oversight.	Congestion, conflicts of use, deterioration of sidewalks.	Economic and Institutional
Weak citizen participation	Absence of neighborhood joint and low articulation	Poor community management, social conflicts	Sociocultural and institutional factors.
Deficit of green areas	High density and pressure on the real estate market	High temperatures in urban areas and the scarcity of recreational spaces.	Biophysical and Social
Homes in poor condition	Gradual construction without direction.	Vulnerability in infrastructure and in the area of health.	Settlements and physical structure.

Critical Territorial Conflicts

Through an in-depth analysis in Kennedy Norte, the disagreement with the Territorial System of Gómez Orea, 2007 emerges, which is Unsatisfactory where pressures are evident in urban development colliding with the limits of the land. This affects the quality of life and the urban environment due to the chaotic occupation that is observed between the expansion of the city and the ecosystems that everything in this sector of Kennedy Norte for which it occurs especially near the Estero Salado causes the loss of vegetation cover and environmental deterioration.

Private Interest vs. Public Interest

Due to excessive construction and land use, there is a great increase in the deficit of basic services and shared public spaces, since when this happens, many of these places are no longer used for what they were really built for, but change their usefulness. Therefore, this dynamic favors the commodification of the territory and weakens social cohesion, the community generating conflicts between residents and economic actors.

Short Term vs. Long Term

In the sector, environmental and social sustainability has been lacking thanks to the absence of long-term strategic planning in this area as it limits the ability to anticipate risks, consolidate resilient infrastructure and ensure balanced urban development.

Synthesis of Potentialities

Although there are many structural problems detected in the analysis of the territory, Ciudadela Kennedy Norte has a very important advantage that is based on the pillars to obtain a planned intervention with a good future for this sector and others that come to take this citadel as an example. Initially, neighborhood or community organizing relies on the influence of local people in the management of the area. Its location is excellent regionally as it easily connects to the important roads of Guayaquil and is very close to important urban buildings. This gives it a key role as a business and housing center.

CONCLUSIONS

The territorial diagnosis that has been carried out in the Kennedy Norte Citadel offers us a broad vision of the state of the situation of this consolidated urban area of Guayaquil for which, from this analysis, it was possible to clearly identify the most important structural problems such as the loss of green spaces, traffic congestion, the risks of flooding that are very attenuating in this work and the commercial pressure that is standing out every day in the most developed activities in this sector.

It was also possible to identify the economic and environmental opportunities offered by its strategic location, the availability of service infrastructure and the basic regulations of the regulations. Therefore, it is understood that this knowledge allows territorial planning to be oriented towards a more balanced and sustainable model. However, the diagnosis has its limitations since they are related to the dependence on secondary sources, own databases, and official statistics which, in certain cases, may be outdated and/or limited by the spatial scope they offer.

Likewise, although informal interviews whose approach and field observation can help us, they do not manage to cover all the actors and dynamics present in the territory; It is precisely this situation that highlights the need to articulate the community more fully in future research that finally responds to the objectives set, it has been possible to characterize the state of the territory, based on the analysis of five subsystems: the biophysical, the sociocultural, the economic, the human settlements and the political-institutional; This same fact has allowed the study to be limited.

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