

Defining marginality in the periurban areas of Quito: A descriptive approach based on empirical and spatial data

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Abstract. In Latin America, marginality is a complex phenomenon involving various geographically significant factors, including the critical, physical, social, and human aspects. Boulderling areas of cities are often excluded from infrastructural interventions and social policies. In the case of Andean countries such as Ecuador, marginality affects not only rural lands but also in-transition areas between different geographical regions, as in the case of mountainous and coastal zones. These regions are characterized by a wide range of natural resources and climate conditions, and because of their diversity and relative proximity to the major cities, they offer potential for sustainable development. Nonetheless, the lack of infrastructure affects the accessibility of these periurban areas and critically limits their interaction. Drawing on these elements, the paper seeks to investigate whether periurban areas can be considered marginal and what tools can depict an encompassing image of local marginality, stressing its advantages for the local community. Following this idea, the paper focuses on the case of Lloa, a large rural parish in the Metropolitan District of Quito (DMQ), to determine which criteria can better capture its marginality, considering it as a periurban in-transition area. The paper suggests a cross-discipline methodology to push the limits of the field through the review of a significant body of literature and a thorough qualitative and quantitative analysis of the case study. Finally, the paper emphasizes the inadequacy of the current forms of planning to effectively define the marginality of periurban areas as a whole in the region by reflecting on the case study and through an analysis of the existing land use plans.

Key words: marginality, Metropolitan District of Quito, landscape, periurban

1 Marginality: Not a simple issue in Quito

1.1 *The multidimensional urban problems in Quito*

The dynamics of migration among countries, as well as between rural areas and cities, are particularly pronounced in Latin America. For instance, Ecuador experienced significant internal migration movements in the last decades and took in a sizable population from

Venezuela, which was experiencing a political and socioeconomic crisis at the time (Malo 2021). This circumstance is influencing how the city will look, which has undergone rapid and contested urban growth in recent decades (Carrión, Erazo Espinosa 2012). According to numerous studies (Carrión, Erazo Espinosa 2012, Cruz Cabrera et al. 2016, Durán Saavedra et al. 2016, Martí-Costa et al. 2016), the growth of the city led to the emergence of a sizable number of marginal sectors that frequently developed through invasion processes and impromptu constructions. The Moncayo administration, in force from 2000 to 2009, attempted to implement a series of reactive and extraordinary actions to deal with the problem. The city authority put into effect an urban plan designed to regulate these informal settlements. However, Quito still has a lot of inequality because of numerous ongoing, historic urban issues and current sociospatial challenges.

There are numerous ways to comprehend urban inequality in Quito. The city, for instance, includes dangerous clusters whose vulnerability leads to social isolation and natural hazards, among other issues (Bracchi et al. 2020, Durán Saavedra et al. 2016, Martí-Costa et al. 2016, Torrijo et al. 2020). These clusters are made up of periurban villages that are currently socioeconomically underdeveloped and lack access to goods and services. Lloa, a periurban parish in Quito, seems to fit the aforementioned description. Indeed, it has exceptional natural resources and a distinctive landscape, which includes different ecosystems in a few kilometers of extension; it is also very close to a crowded and dense portion of the city. However, despite being located in a very touristy area due to the presence of the Pichincha Volcano, it is a critically undeveloped parish with a severe shortage of infrastructure and transportation. The mild regulatory framework governing the development of periurban areas exacerbates this dual nature and reinforces the marginality of this sector.

1.2 *The current theoretical scenarios in the region*

Vulnerability and occasionally poverty are common characteristics of Latin American cities. As evidenced by the literature (Hardoy, Pandiella 2009, Tavares, Betti 2021), this circumstance could lead to a complicated dynamic of marginality (Hardoy, Pandiella 2009, Tavares, Betti 2021).

The researchers contend that, despite a debate on spatial and economic focuses (Sabatini 1981), this concept has multiple starting points (Alonso 2019), including poverty and spatial (Num 1999, 2010, Quijano 1972), socioeconomic, political, and cultural factors (Gutiérrez, Sáez 2018, Oliven, Salazar 1981), as well as environmental ones (Perlman 2019). In Latin America, marginality frequently carries a negative connotation for contested areas or territories, which instead struggle to highlight the positive aspects of their settings and cultures (Horn et al. 2021). However, a recent work published by Horn et al. (2021) describes a multidimensional and multi-scalar scenario of disputed territories in Latin America. In essence, the culture-based co-production of territories offers an antithetical idea of habitat to the hegemonic culture of the neoliberal urban development model. It redefines the parameters of equity, marginality, and (under)development. This approach from Horn et al. may encourage other domains of spatial analysis and valuation to consider marginality as a multidimensional concept and complicated issue (Horn et al. 2021). Therefore, the paper explores the scenario of marginality in Quito since it validates several variables from the literature while also introducing new spatial elements stemming from the local landscape value. As a result, this work employed the landscape units idea, as defined by geographer Emma Pérez-Chacón Espino as “a conceptual and methodological tool that has its origin in the intersection of two different disciplinary requirements: one that derives from the consideration of the landscape as a complex territorial system, and therefore linked to the need to establish a scientific reading of the territory; and another that arises from the requirement to respond to the operational challenges of territorial planning, since, at least in appearance, the natural environment is no longer considered exclusively as a mere support for economic activities” (Pérez-Chacón Espino 2005, p. 124). Moreover, Anne Winston Spirn argues that “successful resolution to urban problems must integrate all these dimensions: social, economic, environmental, and aesthetic. Given limited resources, cities can no longer afford to address these issues separately. [...] We must seek common solutions to social, economic, cul-

tural, and environmental problems” (Spirn 1994, p. 165-166). Thus, this paper aims to analyse a specific case study utilizing a multidimensional method that involves the physical component as well as the socioeconomic and demographic elements. Likewise, the Autonomous Community of Catalonia in Spain produced a first prototype of a landscape catalogue in 2006 (Generalitat de Catalunya 2006, Nogué i Font et al. 2016, Sala i Martí 2010), focusing on the definition of landscape atlases based on previous international experiences. Furthermore, this tool requires the authorities in charge of approving partial territorial plans to incorporate the catalogue’s indications. Moreover, since this approach is simple enough to apply in a variety of situations, this strategy has been employed throughout Europe and, more recently, Latin America, where governments have begun to take important landscape qualities and aspects into account in urban planning.

1.3 *The landscape-based approach*

Marginality in Quito could be described through a landscape-based approach, that considers the value of the context as a sum of processes “both natural and cultural: the patterns they produce are juxtaposed, interwoven and overlain” (Spirn 1994, p. 17). Its physical geography confirms relationships of influence between the natural and artificial elements, as well as links to urbanisation and the socioeconomic process of inequality (Carrión, Erazo Espinosa 2012, Martí-Costa et al. 2016). Given the case study, it is worth mentioning that in ecology, the ecotone – the boundary between two different ecosystems – is considered a transition area where two communities collide and integrate (Solomon et al. 2010), as well as a location with high biodiversity and richness. This idea reveals a perspective on marginality that is more positive and at odds with socioeconomic thinking. Urban policies and socioeconomic concerns are largely ignored in this ecological concept, which focuses primarily on the natural environment. However, its contribution is crucial to comprehending what marginality currently means in Latin America. Therefore, the landscape approach encourages a balanced study of this complex system, as it offers specific methods, such as landscape units, that combine natural elements with anthropogenic and planning issues, thus indirectly taking sociological criteria into consideration. Landscape means a complex whole, a spatial, temporal, and ethical reality at the same time (Venturi 2004). The European Landscape Convention defines landscape as “an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors” (Council of Europe 2004, p. 2). This definition has also been adopted by the Latin American Landscape Initiative (LALI), which is currently in charge of promoting the appreciation, management, protection, and sustainable planning of the Latin American landscape. Due to its complexity, the landscape is made up of numerous dimensions, including material, perceptual, and symbolic ones. These dimensions interact with one another to define the characteristics of a particular landscape.

1.4 *The focus of the paper*

The case of Lloa discloses potential strengths in marginal locations, owing to its border position, underpopulated urban tissue, and non-highly growing demography. These planning issues enhance the relevance of landscape units as they reveal the intrinsic values of the marginal landscape, make an assessment of its current condition, and develop a set of landscape quality criteria and actions to support it. As a result, the perception of marginality raises the question of how to characterize local conditions and provide a framework for researching marginality as a multidimensional urban state. The research hypothesizes that, despite the negative values given by literature, marginality might be understood and conceived as a beneficial circumstance when landscape values insist on studied places.

2 Marginality: What does Latin America have to say?

2.1 Introduction

In Latin America, the concept of marginality is an important academic topic (Perlman 2019). Many scholars from various disciplines have emphasized the term's relationship with the urban context for decades (Doré 2008, Jaume 1989, Quijano 1972, Sabatini 1981), as this concept involves several cultural, political, and economic elements (Oliven, Salazar 1981) as well as spatial meanings (Gutiérrez, Sáez 2018, Perlman 2019). The theoretical framework of this study was developed on the basis of Latin American literature in order to have a thorough understanding of local knowledge and culture (de Sousa Santos 2015).

2.2 The Latin American theories of marginality

A vast body of researchers (Alonso 2019, Doré 2008, Jaume 1989, Nun 1971, Quijano 1972, Sabatini 1981) investigate the evolution of the topic based on the urban dynamics of this region. These elements are quite distinct yet complementary to one another, and they have a direct impact on the growth of a city.

Nun (1971) and Quijano (1972), for instance, addressed the connection between marginality and the issue of poverty and inequality in a city. Quijano described marginality as a socioeconomic phenomenon, highlighting the role of the neoliberal system in the establishment of two polar opposites, the “hegemonic nucleus” and the “marginal pole”. He refers to individuals or small groups who are excluded from the main system as well as from the economic and productive fringe of society because the neoliberal system in Latin America excludes a society with limited economic resources and a low level of education. Another approach to marginality is to measure access to commodities and services, which, in the case of centralised governance, limits the empowerment of peri-urban people and does not provide alternatives to the marginalized condition (Quijano 1972). Quijano (1972) and Nun (1971, 1999, 2010) construct the centre-periphery dualism based on a cluster's location within or outside the city, implying that individuals located further away from the city are more vulnerable to marginalization. Instead, some academics go on to Sabatini's (1981) concept, which has recently been supported by Perlman (2019) and others, that defines the marginal population as part of the city's economic system. Moreover, Sabatini argues that “there does not seem to be a situation of absolute and global exclusion or social marginality, as posited by the theories of marginality. What there is, is a dialectic between rejection and integration” (Sabatini 1981, p. 65). For that, the evolution from a socioeconomic, political and cultural marginality (Oliven, Salazar 1981) to a more enhanced concept of marginal environment (Gutiérrez, Sáez 2018, Perlman 2019, Sabatini 1981) overcomes the “ecologist” limit, establishing a non-linear relationship between economically marginal areas and deteriorated urban sectors (Sabatini 1981). Sabatini's suggestion to include the concept of context in the debate of marginality marks a significant shift in the Latin American theoretical framework. Although the key focus of his speech is habitat or housing, he expresses a fundamental idea: the marginal environment is defined by a lack of goods and services, a lack of neighbourhood facilities and network services, and little or no access to urban employment and service centres, all of which describe the urban context of the area.

Perlman ratified in 2019 the concept of context, stressing how marginality in Latin America is deeply linked to urban poverty as well as to an unfavourable environment described by three aspects: insecurity in the occupation of the territory, the quality of the construction, and therefore its instability, which can disappear suddenly; the third element of precariousness is the mobility of the population, which reflects the first intuition of marginality as an effect of migration (Park 1928). The precariousness that Perlman describes then configures a panorama of fast sociospatial evolutionary cycles.

2.3 Marginality as multidimensional topic

Several studies describe the overlap of different kinds of risks and hazards, from climate change (Romero Lankao, Qin 2011) to poverty and exclusion (Hardoy, Pandiella 2009), and the impact of the COVID-19 pandemic on this fragile situation (Kesar et al. 2021, Tavares, Betti 2021) in the Andean cities. Hence, it is not possible to define marginality as a purely socioeconomic and policy issue, as some studies show how the study of marginality has generated other crucial themes, such as social exclusion (Enriquez 2007), informality (Doré 2008), peripheries and precariousness, poorness, contested territories (Chu et al. 2016, Horn et al. 2021), and urban vulnerability (Alguacil Gómez et al. 2014, Rebotier 2012). The contested territories in Latin America reflect a patchwork of conflicts (Clare et al. 2018, Horn et al. 2021, Perlman 2019, Sisson 2021) and point to a more comprehensive understanding of marginality in this area.

Multidisciplinary approaches spanning both regional and local scales can better address an encompassing definition of marginality (Alguacil Gómez et al. 2014, Hardoy, Pandiella 2009, Romero Lankao, Qin 2011). They describe the complexity of marginality through a multidimensional framework that brings up a theoretical point of view that highlights numerous variables, including the socioeconomic topic, public policy, and housing. The socioeconomic perspectives and spatial elements of the landscape (as an “environmental” macro-system) will be scrutinized in the case study to support or contradict the theoretical question.

3 Quito: A metropolitan district with a huge and multifaceted marginality

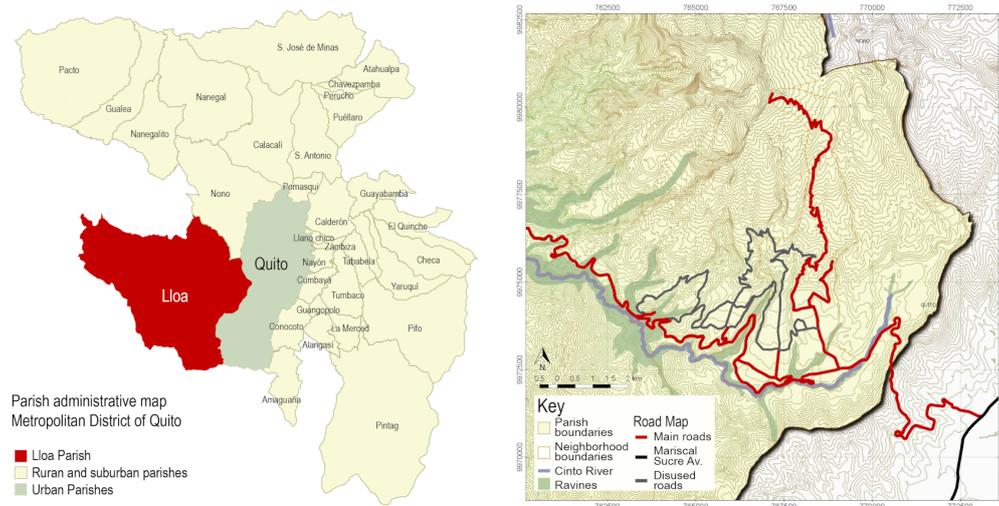
3.1 An overview

Ecuador is a very biodiverse country with 24 provinces that consist of four different climatic zones. Three of them, Sierra, Costa, Amazonía, describe the continental territory, while the fourth one is about the Galapagos archipelago. Nevertheless, due to the volcanic origin of current landscapes and geography, many in-between territories are not specifically defined, and for urban planners, they are perceived as marginal. In other words, these regions’ understanding is extremely underdeveloped, likely as a result of their slow urbanisation and consequently low speculative interest. Furthermore, the definition and regulation of marginal areas are plagued by a number of serious problems, as shown by the current regulatory framework. The Metropolitan District of Quito (DMQ) is made up of 33 rural and 32 urban parishes, along with sizable in-transition areas; thus, its situation reinforces the critical issue. This highlights how important it is to comprehend marginality from a variety of perspectives, including those related to geography, planning, and policy, among others.

3.2 The case of Lloa

A very explanatory example of diversity is the rural parish of Lloa in the Metropolitan District of Quito (DMQ) (Figure 1). Lloa is the largest rural parish in the DMQ, and it occupies an altitude range from 1.800 to 4.786 m.s.n.m. (GADP de Lloa 2019) with a diversity of landscapes and ecosystems. In fact, it has a wide variety of natural resources (Figures 3 and 7), climate futures (Figure 7, Table 1), and therefore landscape units that represent economic and tourism potentialities that are not exploited since the existing infrastructure allows limited access to the sites of interest. It covers 545 km² and makes up 20% of DMQ. Lloa combines geography, biodiversity, and population to create a tourist destination where they can choose from a variety of activities, from sports and recreation to those more in-line with their surrounding natural and gastronomic environment. As a result, Lloa has enormous potential for natural and tourist attractions that could modernize the idea of marginality.

The parish can only be accessed via two routes, both of which are vulnerable to landslides and weather hazards (Figures 1, 2, and 7), while inter-parish transport is scarce and limited. Moreover, only private vehicles are able to reach the internal areas. Because of these circumstances, many of the nearby natural attractions are probably unknown to both tourists and Quito residents.



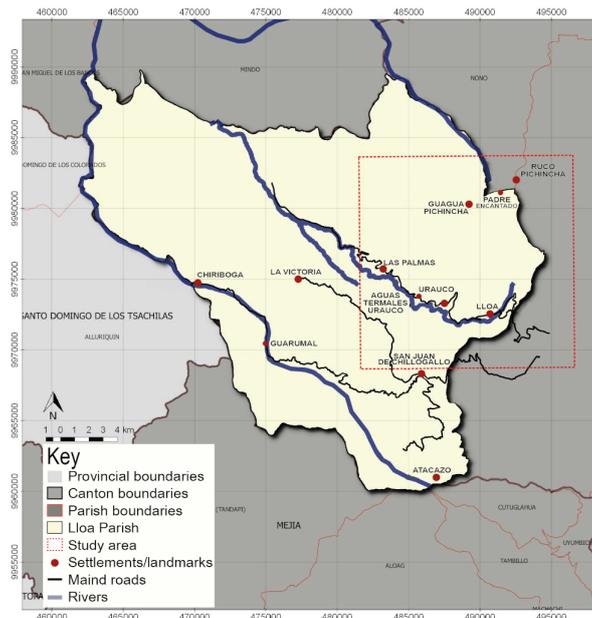
Source: Google Earth and OpenStreetMap

Notes: Elaborated by N. Rodríguez

Figure 1: Lloa in the Quito Metropolitan District. Source: Lloa Development Plan and Land Use Planning (GADP de Lloa 2019); main and abandoned roads

The lack of public transportation in human settlements like farms, villages, and other productive and tourist destinations forces people to organize their transportation through an ad hoc network without the benefit of any formal agreements. There are only three carriageways that pass through the parish. The Virgen del Cinto monastery, a recognized religious landmark, is located along the two routes that connect Chillogallo and Magdalena, two neighborhoods in Quito's south. The connection with Chillogallo is considered a first-order street, while the connection with Magdalena is a second-order street. Because both streets are not directly connected to the main Quito street network, access to Lloa is made more difficult. A third-order street runs through Chiriboga village and connects Lloa to Santo Domingo de los Tsáchilas province. Hence, Lloa could be classified as a parish with poor connectivity, mobility, and accessibility because the quality of the three infrastructures in terms of dimension, maintenance, and use is subpar.

As in the recent story of Quito (Carrión, Erazo Espinosa 2012), the periurban location should imply a rural area in transition to an urban tissue; however, despite its proximity to the city, Lloa is rural in both landscape identity and social aspects. In fact, it is economically and socially excluded from mainstream processes. Moreover, by ignoring their sociospatial complexity, urban policies and planning strategies exacerbate this widening divide. According to the Development Plan and Land Use Planning (PDOT) of Lloa (GADP de Lloa 2019), the area under study is delimited in the north by the parish of Nono and the canton of San Miguel de los Bancos; in the south by the canton of Meja; in the east by the DMQ and in the west by the cantons of San Miguel de los Bancos and San José de Minas (Province of Santo Domingo de los Tsáchilas). Its territory has a clear vocation as an urban green nucleus, i.e., a "space with a high degree of naturalness and a good state of conservation adjacent to the city" (CEA 2014, p. 17). Similarly, in the land use of Lloa (Figure 3), according to the PDOT, the ecological protection zones correspond to 42.7% of the total area, while the natural resource areas correspond to 52.4% of the total area (GADP de Lloa 2019). Further, its boundaries even touch the province of Santo Domingo, a district between Sierra and Costa, that is located at an altitude of only 500 meters above sea level (Figure 7), which emphasizes the geographical and landscape variety of the area. The northeastern part of the parish, which has the most varied landscape, is where urbanised areas are located, accounting for less than 1% of the total area, according to the Agriculture and Livestock Ministry (MAG). The urban consolidated tissue of DMQ is also closest to this area of Lloa. Therefore, Lloa



Source: PDOT of Lloa (GADP de Lloa 2019)

Figure 2: Main road network

could be referred to as an “in-transition” parish, which describes the shifting from one region’s landscape and culture to another.

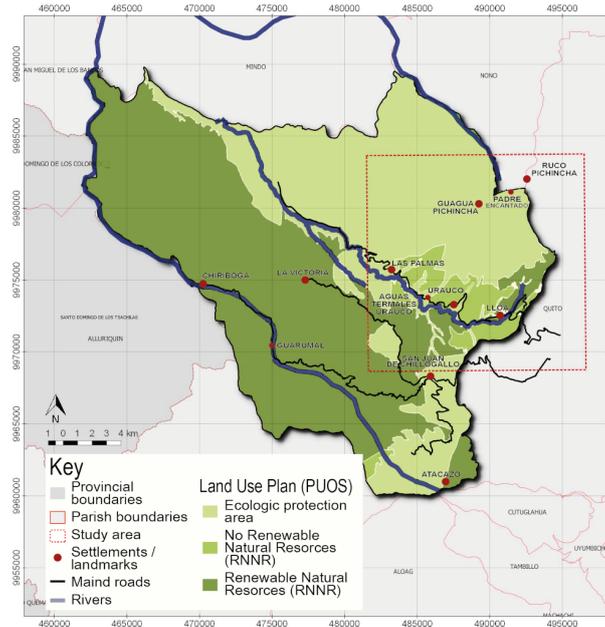
Lack of goods and services in Lloa is another way to describe the condition of marginality. For instance, only 36% of urbanised areas have access to potable water, despite being one of the district’s primary water suppliers (GADP de Lloa 2019). The rest of the populace risks their health by using water from ditches or rivers. Only 34% of the parish, mostly in the centre, has sewage infrastructure, which creates another health risk because most waste is dumped into septic tanks or, in the worst-case scenario, directly into ditches or streams. The garbage collection service has 40% coverage, so there should be critical issues with dumping and contamination. Contrarily, the parish is rated as having a moderate level of public lighting (70%) and electricity (77%); however, this could indicate that the dispersed neighbourhoods are underserved (GADP de Lloa 2019).

The entrance to Lloa from Quito is marked by the Metropolitan Park “Chilibulo-Huayrapungo”, a popular destination for recreation among Quito residents. Nevertheless, a few courtyards and neighbourhood parks reveal a critical issue about public space in the urbanised areas of Lloa. The parish also has a low level of connectivity: only the parish head and the surrounding neighbourhoods are moderately served and connected to the city, and the roads get worse the further the passenger travels from the city. The only paved infrastructure is the Lloa-Palmira collector, despite its imperfect state. The other two collectors that lead to the Chiriboga and La Victoria sectors have a longer earthen roadbed. This critical circumstance is increased by the annual rainfall values that range between 835.10 mm and 1500 mm and an estimated annual average of 177 rainy days (GADP de Lloa 2019), as well as temperature that can reach 0°C. Therefore, the sector is highly affected by the risks of landslides, with severe consequences for accessibility. Further, volcanic threats (very common throughout the country) significantly increase the latter problem in the event of an evacuation.

4 Methodology: Discovering landscape values in marginalized areas

4.1 General framework

This research has an empirical approach with a narrative focus; it does not provide a general definition of marginality but instead makes an effort to weave a multidisciplinary



Source: Land use and occupation plan (2015)

Notes: elaborated by Nadia Rodriguez

Figure 3: Land use map

statement around a specific local notion of marginality. This empirical dialogue between disciplines contributes to enhancing the range of parameters on marginality and further leads to a new definition of the topic and a cutting-edge local planning approach. The authors offer a three-stage analysis to accomplish this. First, this work presents an archival and desktop critical analysis and focuses on Latin American scientific publications since the local academic interpretation of the topic shapes a specific concept of regional marginality.

4.2 Sociospatial methods and tools

This first step is accomplished by conducting a thorough review of the literature on Latin American theories of marginality and contrasting it with observations of the actual situation on the ground, which results in the paper's opening insight and the Latin American academic definition of marginality. The second step is to dive into a specific case study and use descriptive spatial analysis to show how marginality is defined there and what the potentialities of the location are. This step is developed through two analytical tasks: the first one focuses on an official statistical survey delivered by the National Institute of Statistics and Census (INEC 2010), and the second one is based on proving that statistics are supported by citizens. To gather first-hand qualitative data from residents or local stakeholders, a specific ad hoc questionnaire was distributed to the community. The fieldwork analysis also includes 50 interviews conducted over the course of one fieldwork week with local residents. The questionnaire is divided into four sections, the first of which aims to confirm and verify the statistical information gathered by INEC. The next set of items pertains to the working and educational environments, and the third phase is concerned with determining whether a person is a permanent or transient resident, as well as with local businesses and income levels. The final inquiries centre on the assessment of tourist potential and the degree of commitment of the locals. For instance, a series of inquiries have been made to determine which local opportunities could be developed and which priorities have been identified. In order to achieve this, questions are inserted to help measure the ranking of landscape and tourist resources as perceived by each interviewee.

The paper proposes (third step) the use of the landscape approach (Pérez-Chacón Espino 2005) as a tool to review the actual, local situation matched with the socioeconomic findings of the area in order to fully comprehend the values of the space and its conceptual implications. Using ArcGIS software, the final task entails conducting a geographical analysis with the goal of identifying marginal landscape features in the given area. In this instance, the categorization and evaluation of Lloa's landscape have been defined using the methodology outlined in the Catalan landscape catalogues (Nogué i Font et al. 2016).

According to Nogué i Font et al. (2016), the catalogues were designed as a tool to support the implementation of landscape policies in territorial and urban planning, and especially as an instrument to protect, manage, and order the landscape in Catalonia. The catalogues are based on the concept of landscape as a complex and integrated reality of natural, artificial, and cultural aspects. They assume the definition of the Council of Europe Landscape Convention, according to which "landscape" means an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors (Council of Europe 2004). Four phases have been defined for the definition of the landscape catalogues: (i) identification and characterization of the landscape; (ii) landscape assessment; (iii) definition of landscape quality objectives; and (iv) establishment of proposals for criteria and actions. The definition of landscape units is part of the first phase and is aimed at identifying the distinctive features of a portion of territory, that is, recognizing those natural elements, cultural (tangible and intangible), and visual elements that distinguish a given landscape from another (Nogué i Font et al. 2016). The variables used to define landscape units must take into account the territory's dynamics, historical context, points of view, perceptions, and land use rather than just the physical and structuring aspects of the area. The definition of landscape units in the Lloa territory has taken each of these variables into account.

The process carried out in this study does not define an integrated system of criteria and actions; rather, it aims to show that Lloa's negative condition of marginality due to its socioeconomic shortcomings could be "balanced" by the high value landscape that the study shows. Clearly, this could be ascertained or specified at the moment in which the value of the landscape begins to be considered a necessary variable in territorial and urban planning. The landscape study has been applied by identifying general geographical features of Lloa and, based on them, employing two analytical criteria: biophysical and anthropogenic. The former involves the analysis of elements that visually highlight two natural components of the landscape: the biotic, which means flora and fauna, and the abiotic, which describes non-living elements such as climate aspects, hydric resources, and geologic data. The produced maps were created using shapefiles from the Quito municipality's open data (datos abiertos de Quito) and INEC shapefiles, which are accessible from a public website. In order to wrap up the analysis, a visual-basin plug-in has been used to map the visual values of particular landscape clusters in the area under study. The three phases offer a fresh perspective on the concept of marginality in Latin America and present a novel paradigm of it in Quito.

5 Social approach: Are people from Lloa marginalized?

5.1 Desktop analysis

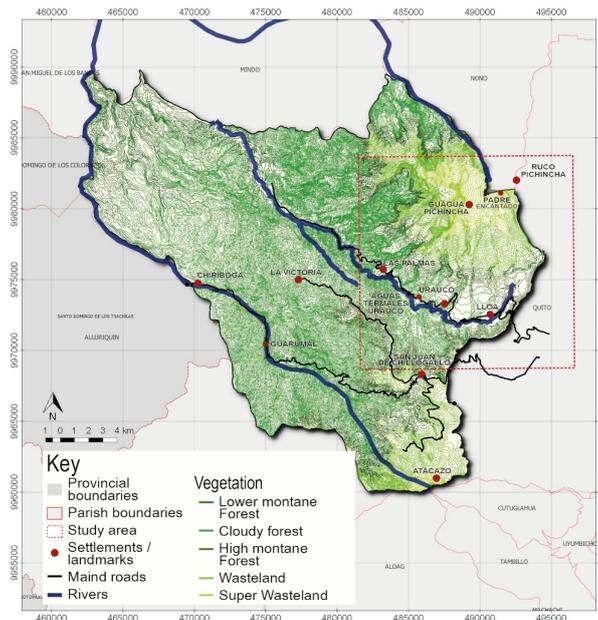
An archival analysis of the socioeconomic situation in Lloa brings the following results. The parish consists of a low-income community with huge precariousness. For instance, official data from INEC (2010) show that 80% of people belong to the population of working age (PET), so this has decreased since 2001 (82%), confirming that the young population is leaving the parish. Indeed, although there is a population growth rate of 0.5%, 58% of the inhabitants are adults (19 to 64 years old), and the age group between 35 and 64 years old is the majority, which indicates that young people are leaving Lloa. Regarding the presence of local economic activities, the economically active population (PEA) compared to the economically inactive population (PEI), denotes a 7% growth of the PEA and a decrease in the PEI, which shows that, despite the conditions, the villagers take advantage mainly in the primary sector, as 52% of the inhabitants are

dedicated to activities such as agriculture, livestock, forestry, and fishing, compared to 11% of industries and 37% of services (GADP de Lloa 2019). Therefore, in Lloa, the average family is supported by jobs in the primary sector. However, due to the health and economic crisis in Ecuador stemming from COVID-19, the census scheduled for 2020 will be published in 2023. Hence, because of this census and the resulting lack of real-time information, empirical field work has been done through conducting interviews with local villagers who voluntarily agreed to be part of the research.

5.2 Interview analysis

Gender equality is confirmed, with 54% of respondents being men and 46% being women, according to the 50 interviews conducted in Lloa. Additionally, the predominant age group continues to be between 35 and 64 years old, which supports the issue of young people migrating. Further, 66% are employed in agricultural activities, 24% in the commercial sector, and barely 10% in the construction industry. Data on the types of work that parishioners do were gathered in order to better understand their way of life: 70% of those polled admitted to having a part-time, independent job related to farming, such as cultivating or selling crops in Quito or at the parish head's weekend fair. Furthermore, a significant portion of people sell their own goods; 60% of those surveyed are business owners, with 83% of them based in Lloa and 17% outside the parish. There is a direct correlation between these variables and the level of income per household, with an income per household ranging from one (50%) to two (30%) basic wages. As a result, most of them are uninsured (63%), i.e., they are not affiliated with the Ecuadorian Institute of Social Security (IESS). Furthermore, the type of work people do affects whether they live in Lloa frequently or permanently, with 27% of people visiting the parish only for work and 50% making it their primary residence. It was also found that most of the people (63%) have lived for more than five years in the current residence (private accommodation), and 58% of the polled form households with more than five people.

Natural elements (40%) and gastronomic offerings (21%) are thought to be the most significant aspects of Lloa's potential and priorities. Recreational activities (horseback riding, trekking, fishing, and mountain biking) follow with 18%, rural travel routes with 13%, and finally cultural and religious issues with 8%. A question was also raised about the parish of Lloa's potential as a tourist and landscape destination. People categorically state that the area has potential for tourism, which demonstrates that Lloa also has a high level of resident relevance and appropriation. Furthermore, 13% of those polled gave priority to the creation of new jobs (13%) or businesses (16%), which has raised concerns about the industry's unstable employment conditions. On the other hand, only 10% stated public spaces as their primary need. However, the request to improve other services, like public transportation and travel agencies, received the most pertinent response (21%). This reflects the subordination of business and tourism issues to Quito. The earlier responses support the interest in landscape potential. A question has therefore been posed about community-based tourism, and 33% of users claim to know what it entails while 62% are unaware of it. To ensure that everyone understood the idea completely, it was explained to them all, and 90% of respondents said they would be willing to participate in or benefit from such a project. This corroborates earlier assertions about the importance of the landscape and supports the notion of community-based landscape development. This information, along with statistical data, demonstrates that Lloa is regarded as a location with significant natural resources and tourist attractions that are connected to the major urban centres. The people who live there are aware of this potential and eager to use it. However, they believe that receiving technical support is essential to gaining empowerment and creating a long-term strategy that enables them to achieve their goals.



Source: DMQ open data 2016

Notes: Elaborated by Nadia Rodriguez

Figure 4: Plant cover

6 A spatial analysis: Is marginality a negative concept in the local context?

6.1 The basic spatial information

The parish of Lloa has been studied as a territorial area of interest from a spatial perspective, with the goal of describing the landscape. The spatial analysis started collecting the basic spatial information of Lloa. The open-access repositories return relevant parish information. First, spatial data on land use, natural resources (plant cover), hydrographic maps, and relief maps were obtained. Furthermore, the road map and Lloa's urban settlement are geo-referenced. The data were then processed using ArcGIS to produce relevant information such as territorial profiles, landscape units, and a visual basin map. Moreover, the basic spatial information was used to develop the Landscape Value Evaluation Matrix, an empirical tool that complements the Landscape Unit catalogue.

6.2 Landscape Units of Lloa

After the spatial analysis of Lloa, the study focused on detecting the specific features of the case study in order to delineate different landscape units. Nogué i Font's methodology was used to conduct the landscape analysis, with a particular emphasis on the biophysical and anthropogenic criteria. This study supports the existence of five ecosystems that are influenced by altitude, flora, and fauna (Table 1, Figure 4). This variety of ecosystems results from the parish's varying slope, which leads from a dry climate typical of the mountains to a humid climate typical of the coastal zone. The water system, which shapes the Blanco River sub-basin (a portion of the Esmeralda River basin), is yet another abiotic component. According to the Lloa PDOT, the Mindo River, Cinto River, and Soloya River are the three major rivers that join to form the Blanco River. These rivers receive water from other rivers as well as from several ravines that are created by the Guagua Pichincha's slope. The PDOT acknowledges a total of 22 micro-watersheds (Figure 5).

According to Nogué i Font et al. (2016), anthropogenic criteria are used to describe the presence of humans in a given area of the landscape and include factors like population, land use, dynamics, history, and aesthetics. Urban settlements in Lloa have no relevant

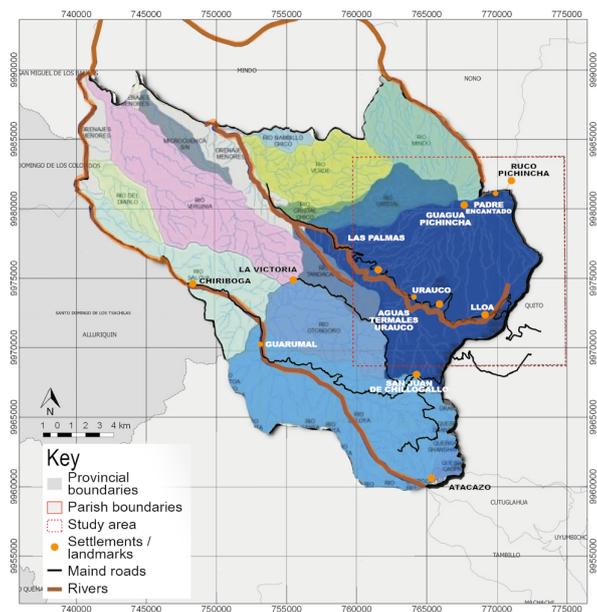
Table 1: Ecosystems of Lloa

	Lower Montane Forest	Cloudy forest	High Montane Forest	Wasteland (Páramo)	Super wasteland (Superpáramo)
Altitude (m.a.s.l.)	1240-1800	1800-3100	3100-3400	3400-4100	4100-4760
Tree characteristic	Treetops from 20 to 25 m, evergreen forest	Tree tops from 20 to 25 m, abundant moss/ low to medium dense forests	Tree tops from 15 to 20 m, sloping stems and abundant moss on the floor	Herbs in tuft and small shrubs	Low-cover rocky soil of very resistant plants
Vegetation	Mosses, ferns, orchids, bromeliads and heliconias	Mosses, ferns, orchids, bromeliads	Mosses and epiphytes	Grassland	Disappearance and gradual replacement at height
Species	Ceibo, guarumo, Zapote and Platanillo	Anthurium of Mindo,, Brunellia acostae and Piper sodiri	Reziera verrucous, Freziera canescens and Croton elegan	Chuquiragua, valerian, Grassland, Aloadilla and Saracha	Cushions, Rosetas acaulescentes, Short-stemmed shrubs and Grasses
Fauna	Dung beetles, eagles, lizards, tangaras, humming-birds, South American chameleon, dwarf iguana	Spectacled bear, whitelisted bats, High Andean mice, land frogs and carnival beetle	Nectarivorous bats, lizards, beetles and prickle	GavilánVariable, the Marsupial Frog of San Lucas and the Moorish Wolf	Condor, curiingue, bandurria, spectacled bear, moor wolf, rabbit
Aquatic fauna	Macroinvertebrates - Astroblep ubidiai	Macroinvertebrates - Astroblep ubidiai	High diversity macroinvertebrates - Trout	Insects and Trout	
Notes	Maximum dry season: one month	Perfect habitat for bamboos	Transitional vegetation / Threat: excessive extraction of wood	Threat: Grassland and crop burning	Threat: Grassland burning

Notes: Elaborated by N. Rodriguez

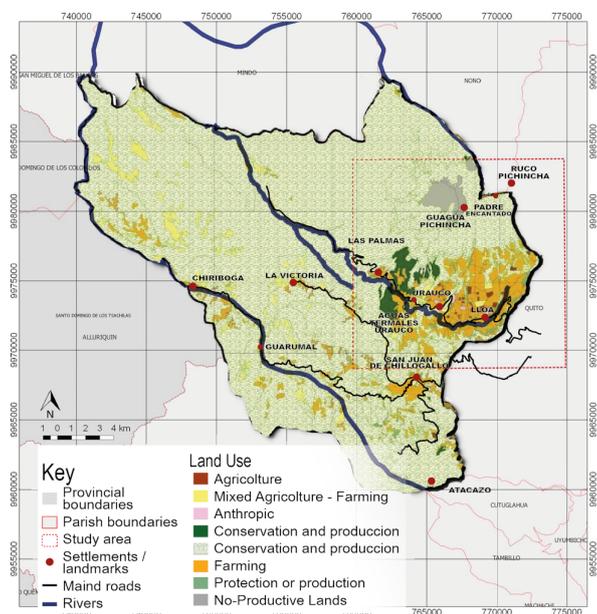
surface area (1%). However, land use shows a significant surface of ecological protection (43%), 52% is destined to renewable natural resources (RNR), and the remaining 5% is interested in non-renewable natural resources (mining), populated settlements, and dispersed agricultural residences (Figure 6). Furthermore, the majority of activities take place in the proximity of the human settlements that border Quito, while the area to the southwest is primarily protected, despite some changes to the forests brought on by agricultural activity.

The historical aspect also imparts interesting information, beginning with the parish's name, which, according to linguist Jacinto Jijón y Caamao, means "high plateau" and originates from the area's original populations, the Cara and the Colorados (PDOT). The Inca also left their mark on Lloa; it is interesting to note that the Ruta del Sol, which is a part of the network of Inca roads leading to Peru, passes through the parish. This route is enriched by other routes from more recent times, such as the Ruta de las Haciendas from the colonial era and the Ruta del Pichincha, which ascends the top of the Guagua Pichincha, circles the volcano, and leads the town of Mindo. These trails, given the topography of the place (Figure 7), provide a number of exclusive observation points that



Source: PDOT of Lloa (GADP de Lloa 2019)

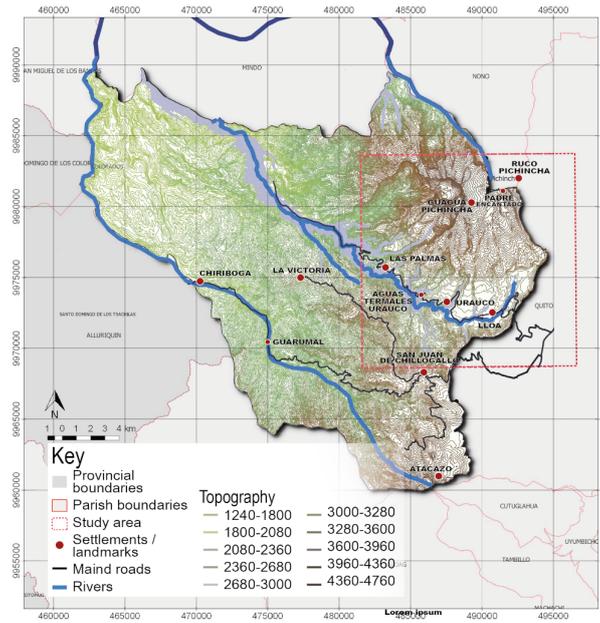
Figure 5: Hydrographic map



Source: PDOT of Lloa, Instituto Geográfico Militar – DMQ

Notes: Elaborated by Consultora Morales, 2015

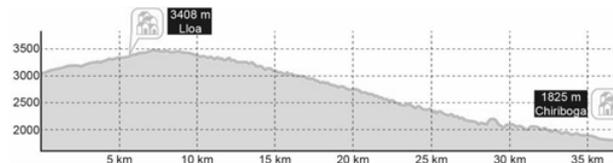
Figure 6: Land Use



Source: DMQ open data 2016

Notes: Elaborated by Nadia Rodriguez

Figure 7: Reliefs maps



Source: GoogleEarth

Notes: Elaborated by N. Rodriguez

Figure 8: Street profile to Chiriboga W-E

are crucial to this study (Figures 8, 9, and 11). As the landscape catalogues of Catalonia indicate, “the determination of the most important observation points – by virtue of their visual scope or human frequentation – and the cartography of visual basins are essential requirements in the delimitation of landscape units, since they allow determining the extent to which each sector contributes to the perception of the landscape” (Nogué i Font et al. 2016, p. 52).

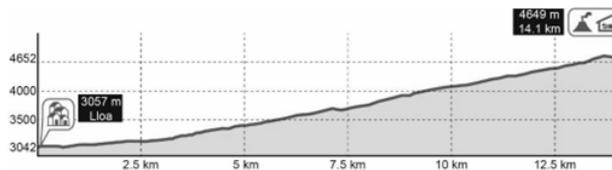
Previous elements have been processed to define landscape units; hence, the biophysical analysis data overlapped the anthropic ones. Therefore, the result stresses the importance of relief and geographical features in identifying a total of seven landscape units, described as follows:

Cordillera: it is characterized by the corresponding climate and vegetation to the moor, its vegetation is scarce and the soil rocky.

Ceja Andina: it is a strip that borders the moor and is the transition between the cloud forest and the mountain range, developing in the which corresponds to the high montane forest.

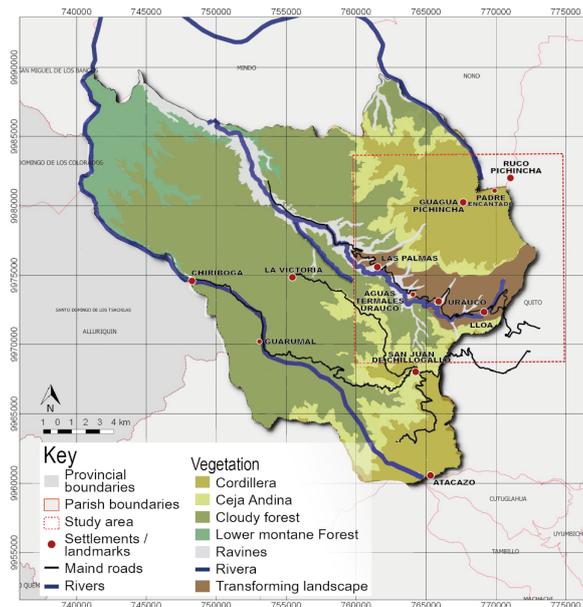
Transforming landscape: is the territory that corresponds to the areas with more inhabitants and whose land is used for crops, livestock, fishing, quarries. It presents a change from a natural landscape to an anthropic one.

Cloudy Forest: it occurs on the slopes and represents the largest portion of the parish



Source: GoogleEarth
Notes: Elaborated by N. Rodriguez

Figure 9: Street profile to Pichincha volcano S-N



Notes: Elaborated by N. Rodriguez

Figure 10: The Lloa landscape unit and the smaller area with the richest landscape

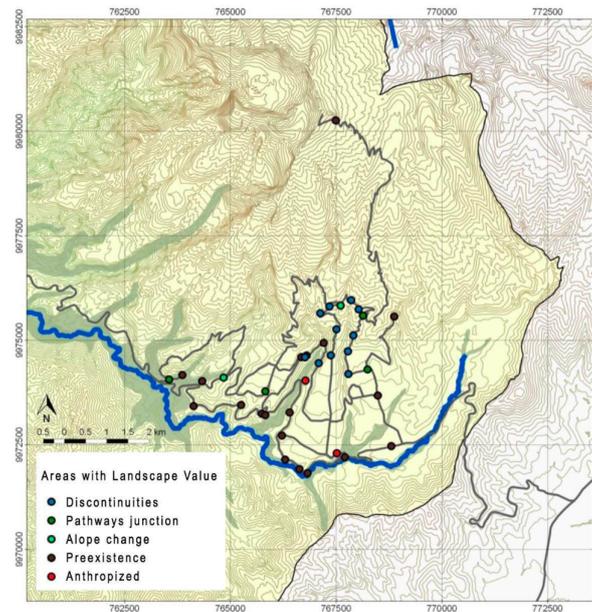
as it is the transition between the mountains and the coast, with the particularity of humidity and low clouds.

Low Montane Forest: it belongs to the sub-Andean highlands and develops under high rainfall and high humidity, causing what is known as “evergreen forests”.

Rivera: it covers the extension of the two main rivers (Cinto and Saloya) and presents a strong risk of contamination of different types.

Ravines: given the topography of the parish, there are numerous ravines, but this unit describes especially the steepest one, the Río Cinto, which in fact is a limit to agricultural growth.

The analysis of the landscape units has followed several phases. The first concerns the collection of biophysical and anthropogenic information. To this end, land use analysis as well as a natural resources survey have been realized using ArcGIS software to process data and information from the open-data of Quito and Decentralized Autonomous Government databases. The macro criteria that are used in this phase are categorized as follows: urban topography, vegetation, hydrology, urban morphology, accessibility, and the dynamic of the area in relation to its historical dimensions and visual basins. The result is the landscape unit map (Figure 10), showing a smaller area really rich for the high number of different landscapes, one close to the other and nearby the urban consolidated tissue of Quito.



Notes: Elaborated by N. Rodriguez

Figure 11: Landscape Value Zone

A thorough analysis has been developed in order to learn more about the perceived value of the landscape and the visual advantages of this outlying area, building on the findings of the landscape unit definition. In order to achieve this, a focused analysis of the chosen quadrant was conducted (Figure 10). Two distinct surveys were conducted: one focused on the topography and tourist attractions (Figure 11), including ancestors', past paths, and modern paths; the other involved a topographical comparison with the surveyed locations. As landscape landmarks, it is possible to identify the Guagua Pichincha volcano peak, the Chuquiragua hill, the thermal waterfalls of Uruaco and Palmira, the waterfalls of San Juan and Chirinchos, among others, and the footpaths and cycling routes that interconnect all these natural landmarks. Along these paths, one can find interesting human endeavours that support tourism, such as the Santuario de Nuestra Señora del Cinto and a number of haciendas (farms), like Hacienda las Palmas and Hacienda Concepción Monjas, which, in addition to housing visitors, also serve to increase awareness of the area's biodiversity. In these locations, it is possible to carry out cultural activities involving learning about the local environment and traditional methods for farming, keeping animals, and fishing in trout alleyways. The Virgen del Cinto monastery, properly situated on the western edge of the Chilibulo Metropolitan Park of Quito, is another Lloa attraction. Devotees travel to the monastery as a pilgrimage destination; in particular, in September, when the Virgen del Cinto is honoured, groups of pilgrims travel by foot from Quito to the shrine.

Based on this, five types of landscape value zones are recognized:

Pre-Existence: places that have value because of tourist attractions, agricultural and built-up historical presences, and services

Anthropic landscape: places valuable because of the human presence

Discontinuity: open spaces along the paths with a high biophysical and perceptible component

Path cross: nodes between principal paths and route towards other attractions

Slope change: nodes between principal paths and underused trail with slope change. The trails are considered as possible potential for future activities

Table 2: Landscape Value Evaluation Matrix

Each kind of type provide a qualitative evaluation

There are variables whose value is descriptive, that is, they are not representative in the

The score is 0 to 3 points, corresponding to the scale: null, low, medium and high

	Component	Variable	Type	Value	Score	Partial Score	%	TOTAL
12	Relief	Type	Hill	N/A	N/A	10	67%	Landscape Value
		Slope	15 to 30%	N/A	N/A			
		Orientation	Sun	High	3			
	Vegetation	Extension	30-70%	Medium	2			
		Temporality	Permanent	N/A	N/A			
		Diversity	Medium	Medium	2			
		Strata	Bushy	Medium	2			
		Foliage	Evergreen	N/A	N/A			
	Fauna	Presence	Low	Low	1			
		Diversity	Low	Low	1			
Dimension		Area	< 50 mq	N/A	N/A			
		6	Signage	Type	Incomplete	Low	1	
				Path	Material	Earth	Medium	2
15	View	--	Upward		Medium	2		
			Eye level	Medium	2			
		Physical stress	No	Medium	2			
		Mental stress	Yes	Medium	2			
		Car - Bike - Walk	High	3				
			--	Important	High	3		

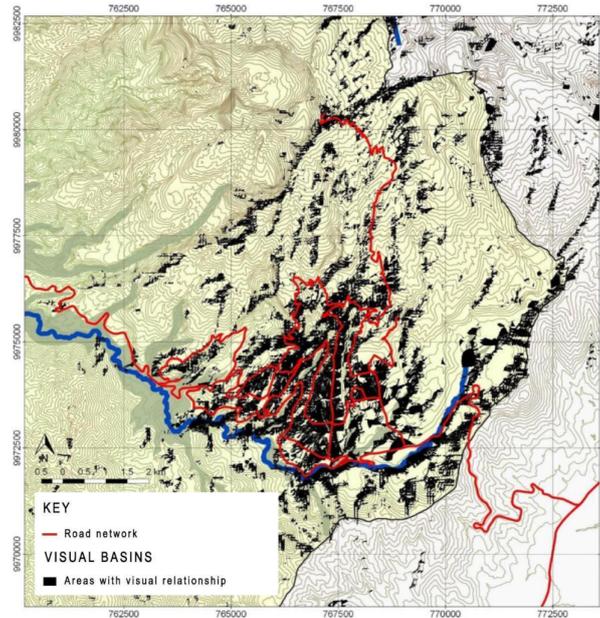
Notes: Elaborated by N. Rodriguez

An empirical analysis of the landscape value of these five categories has been conducted using a novel matrix in order to verify the data. A landscape assessment matrix is created using a survey and analysis of three attributes: biophysical, anthropological, and perceptual, which are further divided into other variables to be scored. The matrix is designed to assess the current state of the landscape, and each attribute is given a score between 0 and 3, representing a scale from “null”, “low”, “medium”, and “high”. According to this rating, the biophysical attribute is made up of four evaluable components and is worth 12 points; the anthropic attribute is made up of two components and is worth 6 points; and the perceptive attribute is made up of four components and is worth 12 points. The maximum score is 30, so this tool enables users to identify which features are weak and those that could be exploited (Table 2).

The topographical analysis shows that the relief has an important impact on the landscape value of the path system. A visual capability study of the path system was conducted in order to define the visual value of the various paths. This kind of study determines a system of visual basins that describe what is possible to see and how far it is possible to see from different selected points of interest.

For the purpose of defining the visual basins, the chosen points were processed with ArcGIS using the Visual Basins plug-in, which enables the surfaces to be in a direct visual relationship while excluding morphologically depressed areas. This step enables the identification of the most pertinent and potentially valuable points of view within the analysed area. The visual basin definition enhances perception of local differences (Figure 12).

Therefore, the concept of marginality could be complemented by the study of the landscape as a combination of spatial and empirical analysis using a multi-scalar and multidisciplinary approach. The focus area is regarded as marginal in relation to Quito based on socioeconomic studies, but thanks to the landscape approach, it reveals a high level of interest due to its divergent values and viewpoints. This is clear when examining the outcomes of the previous landscape value detail. Aspects from Quito and the Lloa protected ecosystems are gathered in this area. In terms of natural and human biodiversity, it can be compared to an ecotone using ecological parallelism.



Notes: Elaborated by N. Rodriguez

Figure 12: Visual basins

7 Concluding remarks

Marginality is a crucial topic in Latin America since this region is still embedded with multidimensional issues of vulnerability, inequality, poverty, and exclusion. According to Latin American theories, marginality is a problem caused by socioeconomic inequality, and in underprivileged areas, the chances for integral human development are severely constrained. Moreover, the impact of environmental risks, climate change, and – more recently – COVID threats calls for a novel approach that involves ecology suggestions and landscape tools in order to enhance the Latin American theory of marginality toward an integral framework of the problem. As the paper shows, there are several points of view for defining marginality, such as socioeconomic, spatial (landscape), and perceptive (citizen perception). These glances display aspects that provide a cutting-edge conceptualization of the topic: the citizen's perception confirms the socioeconomic situation, while the landscape approach gives a complementary position that opens up the possibility for potential future research.

Conceptually, marginality represents a complicated situation of socioterritorial conflict involving both outsiders and residents close to the area. Similar to the case study, such marginal areas might be small settlements a short distance from the city limits that act as a transitional area to rural lands. Furthermore, marginality is an expression of the local communities' overall underdevelopment, particularly in terms of socioeconomic issues, access to goods and services, and the precariousness of housing and the urban environment. When the landscape features are taken into account, however, marginality assumes a different meaning: in actuality, the marginal areas with high landscape values play a crucial role in articulating and governing the territory, offering the possibility for sustainable urban and tourist development.

The case study offered a number of important insights that can be divided into three main categories: (i) involving local communities in the concept's definition, (ii) setting up a testing ground, and (iii) assessing the viability of accepted theories of regeneration. Particularly, the precariousness of their urban environments and economies, as well as the scarcity of goods and services, worsen the ghettoization of Lloa's communities and the perception of marginality. For instance, the lack of adequate infrastructure severely limited communications with Quito, despite its proximity. The overall data

confirm that Lloa is a marginalized territory in both socioeconomic and infrastructural aspects; however, the interviewees showed pride and a sense of belonging, which could be a new positive aspect of marginality if related to landscape values. As a matter of fact, the awareness of landscape features is an element that opens up a new theoretical and practical horizon regarding the definition of marginality.

The landscape assessment matrix developed for the case of Lloa incorporates elements of the methodology described in the Catalan landscape catalogues while also developing an ad hoc approach for the particular situation under investigation. The features considered in the Catalonia catalogues are very broad since it is a tool developed for larger-scale studies, while in the case study a specific portion of the territory was analysed. Therefore, the evaluation framework has been specifically designed to take into account the variables helpful for addressing the issue of marginality, particularly those connected to anthropocentric actions and perception.

The catalogues are a useful tool for valuing the landscape, protecting it, and considering it an essential tool for territorial and urban planning. The landscape, when understood as a complex system, provides a novel interpretation of territories since it offers a cutting-edge definition of those areas labelled as marginal, as in the case of Lloa. It is obvious that using the catalogue's instructions as a universal guideline is not possible. Although its methodology can be used elsewhere, each distinct territory should create its own catalogues and recommendations for the local regulatory system. This research shows that there are aspects of the methodology that can be fully applied, but others require adaptation to the local situation.

Moreover, the landscape units of Lloa disclose a high value of green elements in both their biotic and abiotic components. The huge climate and landscape components demonstrate that the marginality in Quito could work as an ecosystemic balance against pollution and other urban problems. Moreover, the biodiversity and the landscape landmarks display an encouraging scenario for sustainable tourism, creating a new opportunity for developing the parish. The smart use of technology, such as the application of a visual basin plug-in, opens up new ways of interpreting and analysing the spatial features of marginal lands.

The use of landscape to study marginality could produce a potentially novel method if current theories are taken into consideration. For instance, it suggests considering the landscape when planning activities and taking marginality into account. As a result, it creates a comprehensive system of relationships between various disciplinary and analytical dimensions focused on marginality reduction as it is understood today. The research findings, however, do not alter the definition of marginality for marginal urban areas with scant or non-existent landscape values. Instead, it proposes to enhance the variables behind the topic. Further, a new study should be developed using alternative methodologies, including at least the concepts of urban landscape and values that operate on a different scale (Cullen 1976, Gehl 2014, Hillier et al. 1993, Lynch 1960).

These overarching considerations offer a possible response to the query about what specific insights on marginality are displayed by the case of Lloa. The main insight is led by the balance between socioeconomic marginality and the huge variations of landscape in the peripheral condition:

- the enhancement of the landscape view from the most interesting miradores, enables a positive condition of marginality and a perception of the environmental variations as in-transition areas between landscapes;
- a path tourist's system structure, focused on the understanding of the biodiversity of the Lloa, opened the area to new potential connections (leisure and educational) with the city of Quito;
- Sustainable development focused on responsible tourism could generate employment and local business; therefore, it could reduce the critical socioeconomic condition, increase the sense of belonging and, finally, update the perception of marginality.

The results encourage the disciplines that deal with marginality to work no longer as separate areas but as an interconnected network that must necessarily form a system to

obtain innovative results with high impact on the territories. The landscape, particularly in Latin America, is a true heritage that ought to be valued and preserved for the future because it can give marginality a positive meaning and reshape the discouraging narrative that the socioeconomic theories provide. Although descriptive, the findings from the initial phase of this research pave the way for a later stage of work that will systematize a multiscale analysis and define a set of indicators aimed at integrated action on the territory.

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