

Formal and informal Growth in Quito (1980-2010). A Morphological and Planning Perspective

Crecimiento formal e informal en Quito (1980-2010). Una perspectiva morfológica y urbanística

ANDREA MARTÍNEZ BELTRÁN

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Abstract

The dual structure identified in many Latin American cities is characterized by the dichotomy between the formal city and the informal settlement. It is conditioned by the mode of spatial occupation that can vary between the articulation of urban pieces in a planned territory, or the juxtaposition of spontaneous units, which generates a morphological antagonism between these two sectors. In the case of Quito, the analysis of these processes has been carried out so far mainly from a socio-spatial perspective, based on the segregation that manifests itself according to the informal condition of certain peripheral settlements. In this context, it is necessary to delve into the morphological dimension of the new urban landscapes, through a comparative study focused on the city as an integral unit, whose borders between the formal city and the emerging informal city have been transformed. From a morphological and urban perspective, the article focuses on the exploration and categorization of the relationship and contrasts between these two canonical forms of urban development, whose inverse processes and combined strategies from two opposing sectors have given rise to fragments of a 'mixed' city. In addition to exploring urban processes and their morphological characteristics, the text tries to analyze the role of planning in the origin and evolution of these fragments within the urban system.

Keywords

Quito, urban morphology, duality, formal/informal, mixed fragments, planning

Resumen

La estructura dual identificada en muchas ciudades latinoamericanas se caracteriza por la dicotomía entre la ciudad formal y el asentamiento informal. Está condicionada por el modo de ocupación espacial que puede variar entre la articulación de piezas urbanas en un territorio planificado, o la juxtaposición de unidades de carácter espontáneo, lo cual genera un antagonismo morfológico entre estos dos sectores. En el caso de Quito, el análisis de esos procesos se ha realizado hasta el momento principalmente desde una perspectiva socioespacial, basada en la segregación que se manifiesta de acuerdo con la condición informal de ciertos asentamientos periféricos. En este contexto, resulta necesario profundizar en la dimensión morfológica de los nuevos paisajes urbanos, mediante un estudio comparado focalizado en la ciudad como una unidad integral, cuyas fronteras entre la ciudad formal y la emergente ciudad informal se han transformado. Desde una perspectiva morfológica y urbanística, el artículo se concentra en la exploración y categorización de la relación y contrastes entre estos dos tipos de crecimiento, cuyos procesos inversos y estrategias combinadas provenientes de dos sectores contrapuestos, han dado origen a fragmentos de ciudad 'mixta'. Además de explorar los procesos urbanos y sus características morfológicas, el texto intenta analizar el papel del planeamiento en el origen y evolución de estos fragmentos dentro del sistema urbano.

Palabras clave

Quito, morfología urbana, dualidad, formal/informal, fragmentos mixtos, planeamiento

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Introduction

Authors like Potter state that developing countries are characterized by a dual structure, produced between a traditional, indigenous, and underdeveloped sector, and a modern, developed, and westernized one¹. Starting 1980, Quito adds a wide extension of the territory to the urban perimeter. The traditional 'north-south' segregation loses relevance with the appearance of heterogeneous scenarios where popular sectors get mixed up with middle and high-class neighborhoods. The image of dual city moves towards landscapes produced by the contrast between the 'formal city' and the 'informal settlement'. Processes of "urban renewal and worsening of intra-urban inequalities, creating a segregation that even reaches an ideological legitimacy by introducing dichotomies of modern city / old city, historic city / city without history, popular neighborhoods / peripheral neighborhoods, illegal neighborhoods / legal city" appear within this new growth².

In this context, there is a need to study the relationship and contrasts arising between these two types of urban growth: formality and informality, through a compared morphological study that helps to understand a process that has not been studied in detail in Quito. An intermediate study is proposed belonging to a broader research focused on the integral study of the urban structure in Quito. The analysis suggests an open categorization that contrasts the formal and informal morphological expressions, based on a multi-scale mapping examination of three neighborhoods where these two types of growth are recognized, in order to understand the complex transformation logics between 1980 and 2010, while contrasting the variants that may be produced between the formal city and the informal settlement (Fig.1). Finally, a reflection regarding the role of planning is added, considering that in some cases this is one of the most influential factors in the spatial evolution of neighborhoods.

The first one is Solanda, which starts its development as a government proposal for progressive housing for popular classes, and since it is 'planned', it corresponds to the building process of the 'formal' city. The project is presented near to the most developed sector in the south, among partially consolidated neighborhoods, on a territory with few ravines that might complicate its usage. Prior the execution of the project, the site had main roads, railway, and secondary roads being built.

On the other hand, Atucucho is one of the oldest peripheral 'informal settlements' in Quito. It is located to the northwest and has a complex topography surrounded by ravines which difficult its positioning. It starts its development illegally, with precarious communication roads between wide empty areas.

These two neighborhoods are contrasted with El Condado, a 'formal' and planned neighborhood that is built as a high standing gated community, with limited communication roads, surrounded by ravines and popular and informal neighborhoods, demonstrating the contrast between these two antagonistic sectors, duality schemes.

Regarding the state of the art, in the case of Solanda, some publications briefly describe the general characteristics of the neighborhood and its origins, mainly with a socioeconomic (Hinrichsen, 2017; Lingam, 2005; Rodriguez, 1990) and environmental approach (Jha, 2010). Atucucho, an important reference for informal settlement, is the subject of research mainly focused on social practices (Loor y Evans, 2021) and studies about the dynamics of the tenure of land and self-government are common (Van den Broeck et al, 2020). Sometimes, these neighborhoods are subject to comparisons with exclusively informal cases in order to describe the opportunities and limitations of housing self-production (Montaner, 2020; Bastidas and Cuenca, 2020) and self-government (Riera et al, 2020; Testori,

1 Potter, Robert B. and Sally Lloyd-Evans, *The city in the developing world* (Routledge, 2014), 35.

2 Fernando Carrión et al., *La renovación urbana en Quito* (Quito: Ediciones CAE, 1983).

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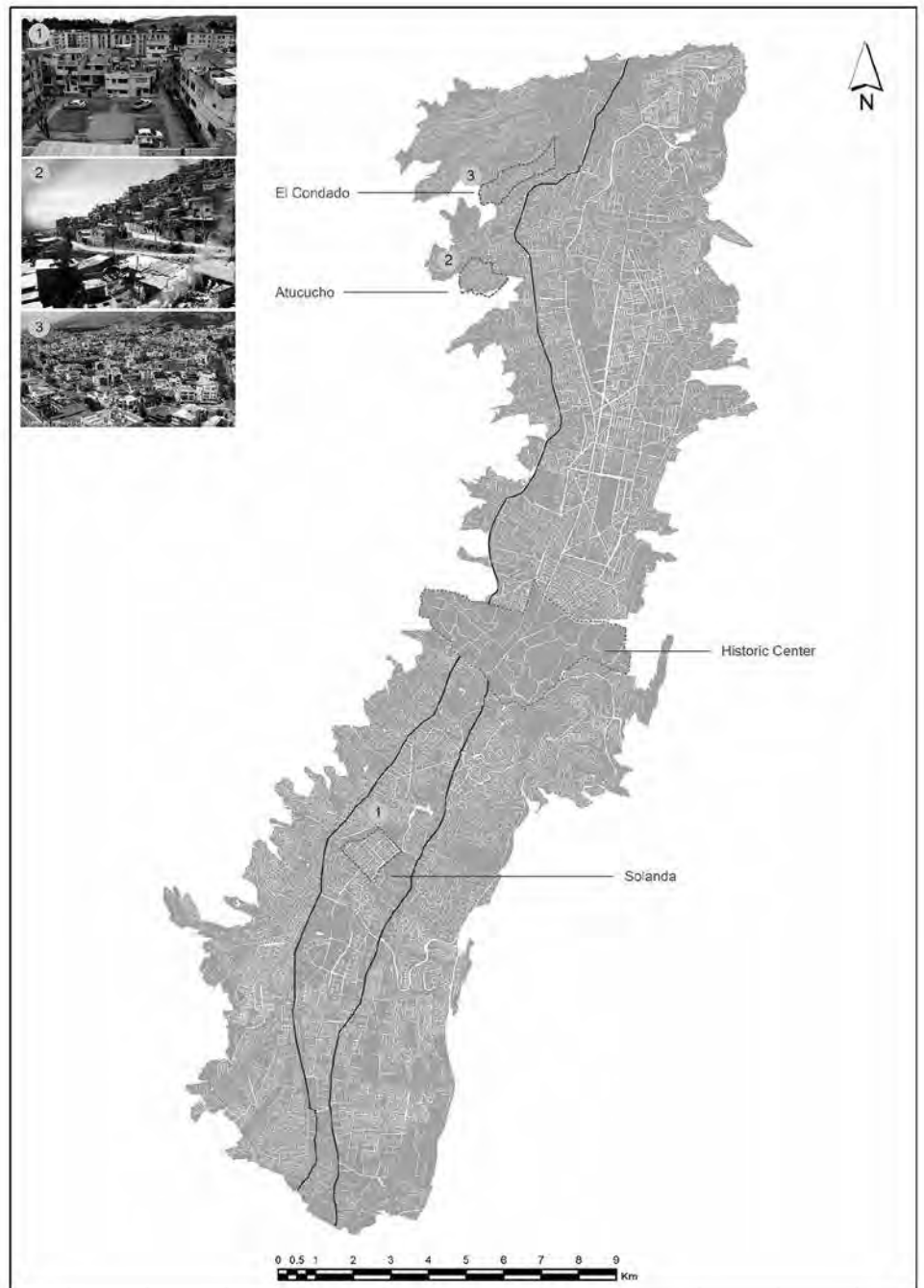


Fig. 1. Plan of the location of the three neighborhoods, and their relation to the main roads. Left: Aerial images of the formal and informal morphology in each case. Developed by the author. Images: 1) Gabriel Muñoz; 2) Testori, 2016; 3) Lyonark.

2016). Regarding El Condado formal neighborhood, the publications are very limited, focused on the socio-spatial dynamics and segregation processes originated around it (Cevallos, 2016). Also, thesis dissertations, despite proposing specific urban-architectonic projects, contribute some complementary information about the neighborhoods.

Solanda, progressive housing as a living solution for popular classes

The Solanda popular housing Plan, which arises from a state planning, is created with the purpose of being a 'housing model' and is built in 1986 as part of a housing solution plan for popular and impoverished classes³. The neighborhood had 130.000 inhabitants in 2010 being the most densely populated one in the south, with densities between 458,38 inhab/ha and 635,40 inhab/ha.

The Project is designed over the old Solanda *hacienda*. Its owner initially encouraged its construction at the north, but it was rejected by the Municipality⁴. The donation was intended for people with limited resources, but considering the advanced age of the donor, the property remained in the Housing Ecuadorian Bank's

3 This period is characterized by the spread of single-family and multifamily housing programs to deal with the existing deficit.

4 Urrutia suggests the construction in La Granja sector, but the idea was not finalized since the authorities considered as unacceptable that a popular neighborhood 'invades' sectors destined for other social classes. Lilia Rodríguez, *Las mujeres de Solanda* (Quito: CEPAM, 1989).

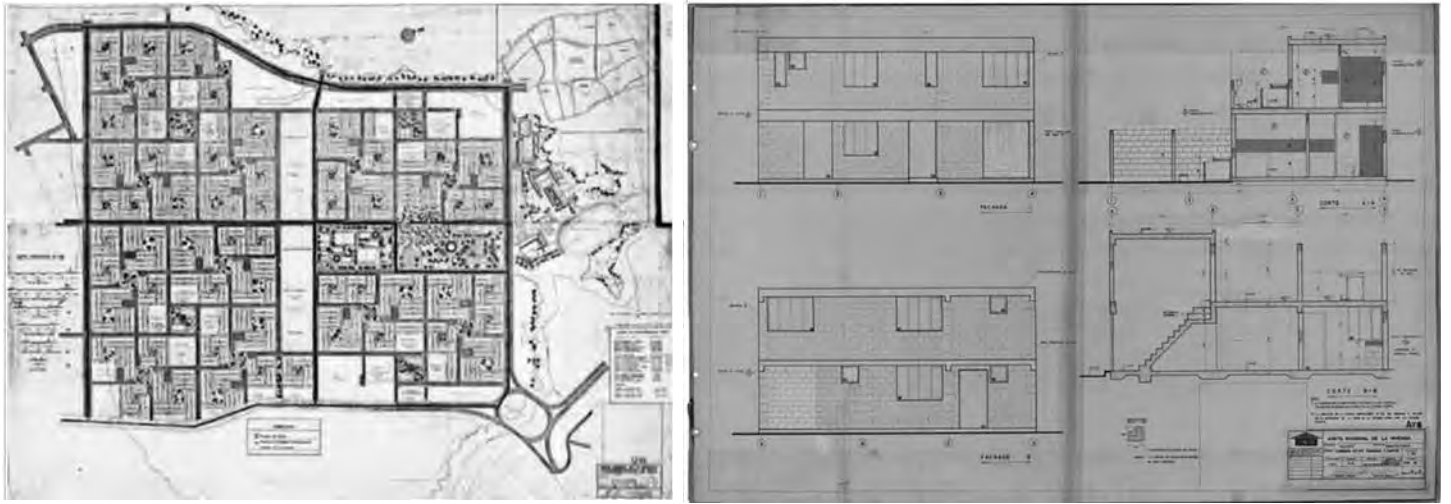


Fig. 2. Solanda Plan Project (1978) and types of housing. Source: MIDUVI files, *El Comercio*, 1976, in Ramón, 2017.

5 230 out of the 291 peripheral neighborhoods. Rodríguez, *Las mujeres de Solanda*.

6 Also, there is a community park for the four sectors. The project would approximately occupy 150 has with 5.600 dwellings, but 4.212 were delivered. Super-blocks were designed with 46 blocks and 32 houses. The minimum dwellings varied between 10.46m² and 24.11m², including one bathroom and the option for expansion, with exception of those with businesses or 3-family houses, in lots of 9.60x9.6m and 9.60x12.80m. Later, two residential complexes were added (blocks of 3-5 floors), totaling 10.800 dwellings. Rodríguez, *Las mujeres de Solanda*.

7 The foreign currency sent by many migrants at the end of the nineties strengthened the economy, supporting housing improvements.

8 200 families organize and decide to take forest lands to trace the first streets. The motivation was to get access to a house, the strategy behind was the need of political support. Giulia Testori. "Gobierno Barrial de Atucucho. An urban alternative base on self-governance and direct democracy" (International Conference Contested cities to global urban justice, Madrid, 2016).

9 During the first five days, the invasion considerably reduced the density of the forest. An engineer was in charge of the main layout (121 plots). With a subscription and monthly installments, the leaders would deliver plots of 8x13m.

10 The neighborhood was known as "sticks city" because its main material was wood from the forest covered with plastic. Later, this was substituted by zinc, blocks, and concrete.

11 Despite being a private property, the water was brought from rivers. With the creation of the committee 'pro-mejoras' (1991), the infrastructure was improved thanks to the construction knowledge of residents

possession. As a consequence, the dwellings were destined for families with fixed incomes and credit capacity, which determined the type of dwelling that they would have access to. The costs for residents were high considering the minimum habitability conditions delivered.

Most of the peripheral neighborhoods in Quito in 1990 were characterized by extreme poverty⁵. Solanda was not the exception, with a precarious structure lacking basic services and infrastructure. The Project is distributed in four sectors and a main commercial axis (Fig. 2)⁶, however, the original design could not anticipate the real needs of the inhabitants, nor reflect the changes resulting from new lifestyles, so it was 'informalized' towards new ways of using the space, both in the planned expansion area and vertically, in order to obtain increased income through the construction of commercial, family and rental floors⁷.

Atucucho, an informal answer to housing deficit

The neighborhood was born in 1988 with a mass occupation of land owned by the *Ministerio de Salud*, and this is one of the oldest informal settlements⁸. The invasion is mainly produced as an answer to the state's inability of providing housing for the poorest population. The neighborhood, originally destined for developments for the elite, rapidly grew, and by 2010 it had six sectors and around 17.000 inhabitants in an area of 54 ha, thus its density exceeds 300 inhab/ha (higher than the average in Quito).

With a collective action, the urban structure was outlined, and the first lots were defined. It comprised a regular grid with parallel roads adapted to the steep topography⁹. Due to its illegal condition, the settlement has an extremely precarious structure, lacking access roads and basic services, which is evidenced in the first houses built with local materials¹⁰ which needed to be inhabited in order to ensure the site occupation. The challenges for the creation of the neighborhood and the access to services are produced by the self-construction of the residents, collective *mingas*, and a strong social organization¹¹.

Atucucho suffered many years of poverty and exclusion. Dealing with severe environmental risks was added to the difficulties faced by the invaders¹². The need for a house forced people to build in ravine edges and settle at the mountainsides causing the disappearance of native vegetation¹³. The situation of Atucucho significantly improved with regularization, changing its status from informal to legal¹⁴.

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who, through mingas, gave form to the sector (El Telégrafo, "Atucucho, una historia de organización y paciencia", February 9, 2014). The provision of services was seldom supported by NGOs or international organizations. Help was also offered in exchange for political support, with 50/50 financing between the municipality and the neighborhood. Testori, *Gobierno Barrial de Atucucho*.

12 Testori, *Gobierno Barrial de Atucucho*.

13 50 years ago, the western mountainous terrain was covered by vegetation. Today, 198 neighborhoods cover it, and the ones closest to the ravines are part of the 90 vulnerable sectors in Quito ("as Evelyn Jácome indicated in El Comercio of March 30, 2019").

14 The legalization process starts with the substitution of 'rural' with 'urban' (1996), and "illegal" with "possession without a property deed". This allowed to build shacks (mediaguas), later replaced by concrete houses. Although a price for the land was established, dollarization caused the value of money to be drastically reduced making it inaccessible for the people. In 2010, the law is modified allowing purchases again in order to obtain legal status. Testori, *Gobierno Barrial de Atucucho*.

15 At the beginning of the 20th century, the railway and the automobile contributed to the democratization of country houses, which proliferate in peripheral areas for the elite. Later, sports clubs and country houses merged, and the Country Club appeared. Although these were considered weekend houses at first, starting 1970 the insecurity feeling led the elite to permanently settle there, building several closed peripheral developments, replicas of the North American suburban model. Guy Thuillier, "Gated Communities in the metropolitan area of Buenos Aires, Argentina: A challenge for town planning", *Housing Studies* (2004): 255-271.

16 At first, the lots had 300m², with stables and golf fields. During the eighties, the appearance of gated communities for government officers eases the obtainment of basic services for the sector. El Condado starts with the construction of houses for ministry members, military commanders, businessmen, who created the "Quito Tennis y Golf Club" in the eighties, an exclusive private social club.

El Condado, a high standing residential site among informal neighborhoods

The structure of 'El Condado' gated community comes from a model brought from England called Country Club¹⁵. This model introduces residencies that comply with comfort conditions, built outside the city around big sports facilities.

'El Condado' is developed over an old *hacienda* "San José del Condado". By dividing it, the creation of residential developments for public officers and provision of infrastructure was enabled. This attracted families from mid-high class looking for social homogeneity and a healthy environment¹⁶. Finally, in 1993, the gated community was legally constituted, which had basic services and infrastructure since the beginning, receiving around 4.990 inhabitants with an average density of 41,1 inhab/ha.

Considering it was a planned and 'formal' neighborhood, the occupation starts on the flattest territories, close to the main access and the private club, later expanding to the higher area with complex topography.

Analysis of morphological transformation from a comparative perspective: formality and informality

Origin and evolution of the layout

On the territory occupied by planned neighborhoods Solanda and El Condado, the traces of initial execution outlines are recognized, which keep their form until nowadays (Fig.3a y Fig.5a). In El Condado, the private club was built, and a ravine passes through the neighborhood in a longitudinal manner. Meanwhile, in Atucucho, as it is a forest territory without development, no roads were available to lead to the first settlement. In 1980, there was only a winding path which later would constitute the main road of the neighborhood, on which the grid was created (Fig.4a).

By 2010, Solanda and Atucucho have been completely consolidated, with land-use transformation and scarce empty plots. El Condado, has been partially consolidated with some empty plots (to the west), and, unlike the aforementioned ones, has kept the land-use defined since the beginning. However, the ravine has disappeared in order to build houses and public use areas.

Morphology of the layout

In the case of Solanda, Fig. 3b shows the high density of spatial occupation of the constructions, except for housing blocks on the edges, whose design is less compact and with wide open spaces, compactness that is also different than the one in adjacent neighborhoods. The concept of the project suggests regular layouts with rectangular plots, mainly residential, arranged in the space starting from the community use centers, depending on their scale and location inside the complex¹⁷. Solanda was planned based on a model comprised by units, which repeat at different scales and levels, and adapt to form internal spaces of blocks, and the aggregation of several units form a macro unit whose model is the same. A parallel-interrupted layout is created in this morphological disposition, which can be identified as an alternative to the Neighborhood Unit, whose formal structure includes the provision of green areas and facilities, and which has the same logic based on centrality. It is worth considering that said model was applied in a systemic manner mostly in residential developments in Latin America since the 50s, to direct housing public policies¹⁸.

In Atucucho, the layout is the result of the union of two typologies: a rigid central structure that transforms into a flexible and organic form towards the edges. In the

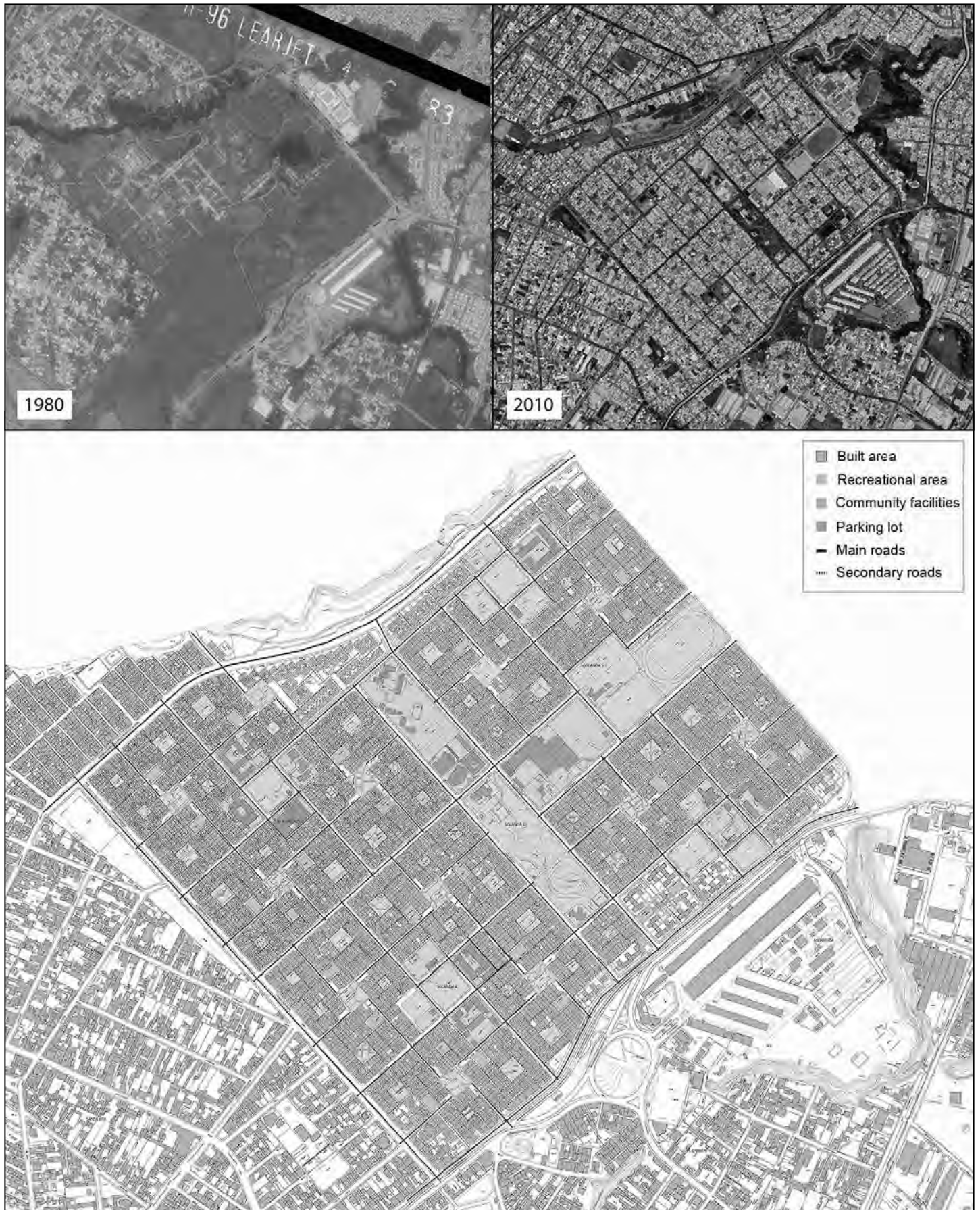


Fig. 3. a) Morphological evolution of Solanda (1980-2010). Transformation of a planned neighborhood towards an informal consolidated model; b) cadastral map (2009), with plots occupation, empty spaces, hierarchy of roads and identification of land-uses. Developed by the author based on municipal plans and satellite imaging.

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- 17 Minor community centers have recreational areas, sectoral centers have recreational areas, educational, social and health facilities.
- 18 Imported from Europe, the 'Neighborhood Unit' is a module that eases the organization of residential cells, considering climatic conditions and local social traditions. Doris Tarchópulos. "La Unidad Vecinal: Objeto de investigación de Josep Lluís Sert" (congreso Internacional de Vivienda Colectiva Sostenible, Barcelona, 25, 26 y 27 de febrero, 2014). Initially intended for low-income sectors, it overshadowed the *garden-suburb* model.
- 19 The collective areas include hallways, yards, gardens, sidewalks, streets.
- 20 According to census data, population grew significantly from 22.361 inhabitants (1990) to 78.279 inhabitants (2010). Houses reached 24.526 (2010) from 4.817 (1990).
- 21 The narrow secondary roads demonstrate this, whose buildings do not respect the limits, creating a toothed shape which violates the public space.
- 22 Abramo, 2011, in Pamela Ramón. "Solanda, el caleidoscopio de la experiencia urbano-barrial (Master's thesis, Departamento de Antropología, Historia y Humanidades, FLACSO, Quito, 2017)
- 23 Houses vary between 70-400m² including up to 8 units. The development rate is indicated in their appearance: the concrete shows a greater advancement as opposed to temporary materials, and the number of floors / blocks shows the extent of economic and natural growth. María B. Bastidas and Marlow, "Los capítulos que se le olvidaron a Elemental: lógicas informales para el diseño de vivienda social", *Estoa* (2020): 224-254

center of the neighborhood, the rectangular layout is arranged through roads parallel to level curves, with modules that repeat themselves in a bidirectional manner. However, in more complex territories, the structure of the module is deformed, transforming itself into organic and irregular super-blocks, adapted to the morphology of the ground. This also happens in the plots, which, despite having undefined limits, adapt to the form of the module-block and to the access street. Even though this spatial organization logics allows an optimized usage of the lot, the lack of planning and state intervention led to a lack of public spaces and green areas. The peripheral location of sports and educational facilities, besides a few courts located randomly in remaining spaces, suggests that they were not considered in the initial planning focused on housing¹⁹.

Finally, in El Condado, the design provides a linear disposition of radial frames along a main articulator road. The comparison of density and the type of spatial occupation between the gated community and adjacent neighborhoods, besides the morphology of the layout, enables its easy recognition inside the sector (Fig. 5b). There is a big presence of green areas, both in El Condado and in nearby informal neighborhoods, which have different expressions: private gardens versus farming areas.

Type of housing and land-use

In Solanda, although the function of each element in the plan was defined, the convergence of various heterogeneous land-uses makes it difficult to recognize it as an exclusively residential, commercial, or productive neighborhood. This is due to the 'spontaneous' growth encouraged by the inhabitants, in response to their growing needs and the pattern of extended family, modifying the residential usage by including businesses or production workshops, and generating an important densification process²⁰. Besides the risk of these transformations, with structures designed to support minor capacity, private open areas were reduced or disappeared in the self-management process, and frontal streets were invaded, increasing the compactness in a significant way, and detracting permeability due to the planning of townhouse volumes²¹. On the other hand, having 'ignored' the economic growth of the residents meant a modification of the real usage of the public space, through illegal appropriations for example of passages and smaller recreational centers used as parking lots, or townhouses transformed into buildings of several floors. This 'informal' order developed by subjects-agents looking for living spaces, more than a problem, would be an alternative to socio-spatial inequality in our societies²². This caused constant demonstrations for access to public services, despite being planned. Nevertheless, a factor worth mentioning is that planning of neighborhood services granted autonomy to it, by not depending on urban centers for daily activities.

In Atucucho, spontaneous growth and lack of regulation are reflected in the diversity of functions. Houses are mixed and respond to family practices, and can contain commercial, productive, storage, or agriculture areas. Since the concept of 'progressive housing' is used, the morphology of the dwelling transforms, and its development level is proportional to the economic development and family extension rate. The concept of single-family moves to multi-family²³, due to family growth or the need for rent. In Solanda and Atucucho, the growth is produced in 'pixels' by means of two logics: sequential (one floor) and multi-directional (vertical or adapted to the slope), with extensible and open structures which gradually integrate the infrastructure. This allows a better adaptation to specific context conditions and qualitatively improves the internal space.

In El Condado the type of housing differs, it is mainly single-family and isolated, including maximum construction percentages in order to keep internal green areas, courts, or swimming pools. Later, the multi-family house is incorporated, modifying

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the appearance of the gated community, and allowing private sponsors to develop buildings to take advantage of the profitability of the land at a lower price compared to central areas in Quito. Also, land-uses are clearly defined since they were planned from the beginning, with specific living zones, commercial, educational, religious, and recreational facilities (courts and parks) and quality public spaces, everything for the exclusive use of its inhabitants.

Road system

The three cases comprise two road systems: a main hierarchical one, supported by an intercommunication and internal transit secondary one. The difference is that the main system in Atucucho is for vehicular use, while the secondary one is focused on pedestrian use, and has a design perpendicular to level curves. This secondary system is structured with community staircases which give access to the areas with higher slope, and small provisional paths consequence of the continuous expansion of the neighborhood.

In El Condado, the contrast is in the access to the system, as the main one is exclusively private, whose structural axis goes along the neighborhood connecting different segments to each other and to the exterior in two restricted entrance spots; and a second public external network which connects the surrounding neighborhoods and passes through the gated community underground without physically or visually entering it.

Relation with the territory and surrounding neighborhoods

The three neighborhoods have similarities regarding the presence of ravines that frame the settlements, representing barriers for growth. In the case of El Condado, the fragmentation is enhanced by the construction of big exterior walls which enclose the space while looking for socio-economic uniformity, reducing encounter areas between different social groups, and providing security²⁴. As a result of the encounter between unequal and opposing neighborhoods, planned and informal, an urban segregation process starts which flags the socio-spatial differences between neighborhoods that share similar geographic location characteristics²⁵. This flagged differentiation, even given by the level of services provision, creates disruption and fragmentation of the peripheral urban structure²⁶.

Another common characteristic is that each one of these neighborhoods is inserted as an independent and arbitrary element, imposed within its sector, regardless of their formal or informal nature, of the consolidation level of surrounding neighborhoods, or of location within the city. In the neighborhoods with formal origin, planning ignores the urban form of the existing layout, which is emphasized by the lack of continuity with existing roads and the difference in residential density, especially in the gated community, which becomes an isolated site which ignores the city growth.

On a larger scale, this generates a mosaic constituted by the combination of different morphologies, oriented in several directions, which confirms the result of an order which was badly established by the planning, which omits the environment and the people's needs, which, in some cases like Solanda, caused a spontaneous reformulation with informal tendency.

In Atucucho, on the other hand, this development which was formally 'disorganized' and 'spontaneous' allows to establish an open, flexible, and dynamic growth system, which eases the progressive construction, and which adapts to the specific needs of its inhabitants. Despite being an 'informal' neighborhood, a planning order is established governed by tacit cohabitation rules, which makes us think about the extent and nature of the state intervention in the development of the city.

24 There are two restricted entrances and surveillance spots, added to the walls enclosing the houses. With the construction of the wall, the residents self-managed basic services.

25 El Condado Parish comprised four properties, which were surrendered to the *huasipungueros* (land laborers) in the sixties. With the first divisions, the occupation of neighborhoods as different as la Roldós and Pisulí took place. Jonathan M. Cevallos, "Los paisajes de la segregación. Contrastes espaciales de la segregación residencial urbana: Caso Urbanización "El Condado" y "Prados del Condado". *Eidos* 9 (2016): 48-63

26 El Condado has 98.8% of sewage and utilities coverage, San José Obrero 33.6%, and Rancho Alto 3.6%.



Fig. 5. a) Morphological evolution of El Condado (1980–2010). Formation of a high-class residential site surrounded by informal neighborhoods; b) cadastral map (2009), with plots occupation, empty lots, identification of road networks, and private land-uses. Developed by the author based on municipal plans and satellite imaging.

	1980			2010		
	Solanda	Atucucho	El Condado	Solanda	Atucucho	El Condado
Type of growth	Formal / planned	Informal / spontaneous	Formal / planned	Informal / spontaneous	Formal / legalized	Formal / planned
Social group	Working class	Popular class	Upper class	Working class	Popular class	Upper-middle class
Typology of the neighborhood	Residential plan of progressive housing	Invasion	Country Club / Gated community	Residential plan of progressive housing	Progressive housing	Country Club / Gated community
Density	N/A	N/A	N/A	458-635 inhab/ha	300 inhab/ha	41.1 inhab/ha
Consolidation level	None	None	None	Consolidated	Consolidated	In consolidation process
Type of urban layout	Regular grid	Regular / Irregular grid	Radialcentric / Irregular grid	Regular grid	Regular / irregular grid	Radialcentric / Irregular grid
Road system	Presence of roads from the city	Precarious roads	Presence of roads from the city	Consolidated road axes	Vehicle roads / pedestrian in consolidation process	Consolidated private and public road axes
Infrastructure and basic services	Precarious / deficient	Non-existent	Formed	Formed	Incomplete	Formed
Type of construction	Progressive housing in plans	Non-existent	Non-existent	Progressive housing in construction	Progressive housing in construction	Consolidated
Habitability conditions	Minimum	Precarious	Optimal	Acceptable	Minimum / acceptable	Optimal
Construction materials	Block / concrete	Wood / plastic	Block / concrete / steel / finished	Block / concrete	Block / concrete / zinc	Block / concrete / steel / finished
Collective facilities and recreational areas	Planned / public	Non-existent	Planned / private	Built / public	No planning / public / random location	Built / quality / private
Limits and borders situation	Neighborhood borders established by planning, few natural barriers	Established by natural barriers that limit growth	Neighborhood borders established by natural barriers	Neighborhood borders established by planning, few natural barriers	Neighborhood borders established by natural barriers that limit growth	Neighborhood borders established by exterior walls and natural barriers
Access to the neighborhood	N/A	N/A	N/A	Free	Free	Restricted
Continuity with existing urban layouts	Non-existent	Non-existent	Non-existent	On main peripheral axes	Non-existent / peripheral roads	Non-existent
Situation of surrounding neighborhoods	In consolidation process	None	In consolidation process	In consolidation process	In consolidation process	Consolidated

Fig. 6. Synthesis of the comparative morphological analysis of the three neighborhoods (1980-2010), which allows to obtain a synthetic vision of the urban process and the contrasts between formal and informal cases. Developed by the author.

Categorization

Based on the comparative analysis, an open multi-scale categorization is suggested, which divides the main elements of the morphology of the analyzed formal and informal cases in four categories.

- Types of housing and base module: contains the dominant blocks shapes, their plots organization, and houses disposition and occupation rate.
- Residential unit: the base module which originates the morphology of the main layout is identified and the alternatives/variants produced in a group of modules to respond to external factors.
- Main and secondary road system: hierarchy and setting of both systems are analyzed, based on usage.
- Model of urban fabric: maps the concurrence of the previous layers and the functions of non-residential modules are identified.

The analysis shows that the urban structure of the neighborhoods with formal origin and the informal settlement were formed from three different development models. It is determined that the Solanda and Atucucho's models remain incomplete and in constant development, a process that is expressed in each one at different levels.

In Solanda, although the layout was completely set, the built structure and the basic services remained incomplete for a long time. In Atucucho, the situation is similar, and to this is added the urban layout that remains as an open and dynamic grid, that would allow unlimited growth.

El Condado, on the other hand, has a closed model, with well-defined spaces and limits which cannot be infringed, with terminations such as *cul de sac* and perimeter walls which eliminate the possibility of growth or inter-neighborhood connections.

Planning starts from a 'decision' in the three models. In Solanda, authorities and planners determine a project that is reduced to the creation of a system of alignments and juxtaposed units, lacking a *posteriori* follow-up to guide an organized and sustainable growth. This allows the neighborhood to choose a spontaneous transformation, where it loses its original nature, entering an intermediate group which integrates formal and informal strategies. This informalization process leaves

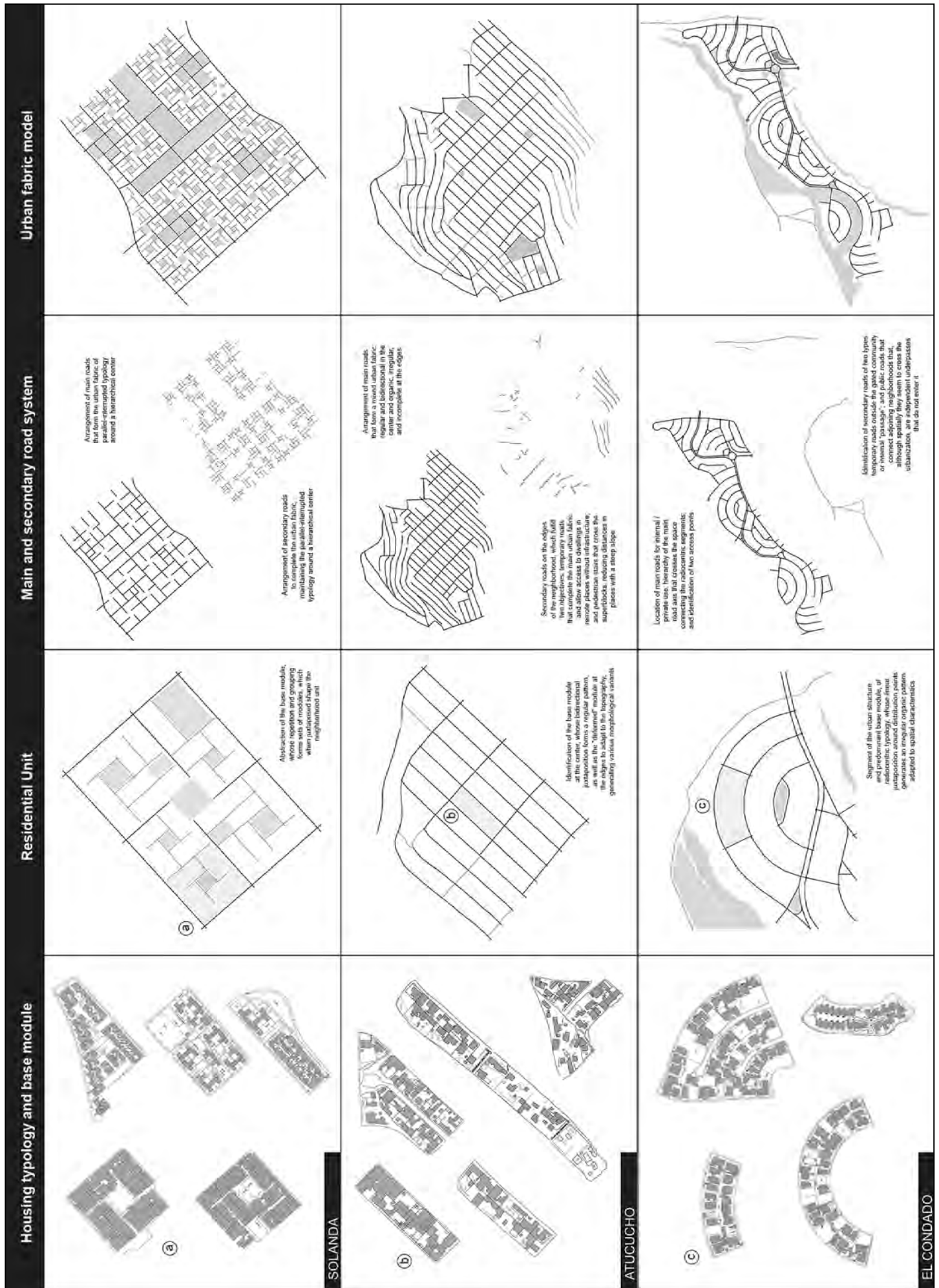


Fig. 7. Categorization of different morphological expressions among the three formal and informal neighborhoods at different scales. Developed by the author.

Forma y comportamiento:
modelar la urbanidad

Form and behaviour:
modelling urbanity

ANDREA MARTÍNEZ BELTRÁN

Formal and informal Growth in Quito
(1980-2010). A Morphological and
Planning Perspective

Crecimiento formal e informal en Quito
(1980-2010). Una perspectiva
morfológica y urbanística

the neighborhood in a disadvantageous position, losing quality and social exchange spaces, in return for larger scale and higher incomes.

In El Condado, also formal, the decision is private, with minimal state intervention reduced to control adequate basic services and infrastructure provision. The follow-up of the closed unit (gated community) is internal, through regulations that guarantee that the neighborhood remains in the formal category, despite its transformations.

In Atucucho, the population makes the decision with limited professional support, and without any state intervention. Since it is the people who direct the setting of the neighborhood, without borders, surfaces or strict guidelines planned beforehand, the design is dynamic and can adapt to changes. The internal regulations are also gradually established which allows to form an organized system, directing the growth and the limits between public and private. Its development is inverse, becoming 'formal' by means of regularization, a process that only guarantees a property deed, although the state remains unlinked regarding the provision of services and quality housing.

Conclusions

Considering the abovementioned, it can be argued that the 'origin' is not the only factor that determines the formal or informal nature of a neighborhood, or its morphological characteristics. Elements such as design or type of planning, with open/close, unfinished/finished, compact/scattered approaches; the people's needs and dynamics in the process of appropriation of public and private space; and the extent of state intervention in a *posteriori* follow-up of neighborhoods, determine the final nature, the urban morphology, and the relation with built environments.

In this context, planning does not produce organized growth by itself, although it can guarantee the inclusion of services and community spaces. The models demonstrate that, despite the existence of different types of planning, both formal and informal cases have undergone a transformation of the original design, even inverse processes which lead to the appearance of several neighborhoods of 'mixed' nature, making this strictly dual structure, where formal opposes informal, disappear.

Motivation behind growth logics in each neighborhood is the aspiration to improve their life conditions and quality. For the elite, this improvement is translated into migration to other sectors or transformation of single-family to multi-family houses to obtain higher income. For poor communities, the objective is the unlimited expansion and transformation of the original house, and its legalization if needed. The main role of the state should be following-up with this natural growth process, establishing limits when the safety of the residents in a community is threatened.

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