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Reading of the Evolution of the Urban Shape of the Plateau – City of Praia

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Abstract. An analysis of urban morphology of the historical nucleus (the Plateau) of Praia (Cape Verde) highlights the process of thinking and making a city expressed in António de Lencastre 's plan and its further development. For this, the processes of urban transformation occurring over time in the Plateau are shown. The methodology used for this urban analysis allowed an understanding of the intervention process on the Plateau through an interpretative analysis of morphological evolution obtained from: i) a detailed identification of cartography; ii) a comparative morphological analysis of urban development based on old and current cartography; iii) a vectorization of the maps through scale normalization (the letters were overlapped with the 2018 chart); iv) an identification of public buildings and public spaces; and v) a quantification of the elements of urban form. In the quantification of the elements of the urban form, the reading and interpretation of the different maps is synthesized through analytical drawings and tables.

INTRODUCTION

The city is a laboratory of diverse human actions. These should be understood as the response to humankind's daily needs, being visible in the way that humans inhabit the place where they live. Humankind transforms its living space. Preference in choice of site will depend on the opportunities of living that each place offers. To this end, the individual acts on, transforms it, moulding it to individual taste. The city is thus the outcome of the accumulation of human experiences over centuries. Interpreting the city through a morphological reading of the urban centre allows us to reflect on the production of the urban layout throughout time. Framed by a theoretical explanation, this process elucidates the phenomena that participated in the spatial formation of the city. New needs and ambitions drive the growth of the urban fabric. The layouts of urban structures multiply, intensify, overlap making the city increasingly more complex and difficult to relate, and accordingly current cities operate as a palimpsest [1, 2].

We present as a case study of this investigation the City of Praia, more specifically, its urban centre – the Plateau. We defined the general goal of this study as the interpretative analysis of the morphological and urban evolution of the Plateau since the foundation of its first public building, the Church of Our Lady of Grace, in 1526 up to the present time. Hence, we sought to define the guidelines for specific issues of urban morphology pointing to a methodology suited to the study of the urban analysis of the Plateau. We sought to delineate the evolutive dynamics of the Plateau's urban morphology over time and understand the origins of these dynamics, analysing the process of appearance and growth of the Plateau's urban space, aimed at showing its urban design.

Underlying this research are studies on urban morphology and territory in Portugal [3, 4], studies on urban morphology of Portuguese origin [5-8] and specific studies on the City of Praia — Plateau and its genesis [9-11]. Having detected insufficient studies on the urban and morphological evolution of the City of Praia — Plateau, we believe this should be redressed with a study underpinned by a research methodology favouring greater comprehension and understanding of the Plateau's urban fabric based on the reading of ancient and recent cartography of the City of Praia and on the production of analytical drawings of the Plateau enabling quantification of the urban shape.

METHODOLOGY

This investigation follows two stage, the collection of information and data analysis. The collection of information should throw light on the research in various archives (National Library of Cape Verde, Cape Verde National Historical Archive, Directorate General for Cultural Heritage of Cape Verde, Portuguese Army Geospatial Information, Portuguese Overseas Historical Archive of the Tropical Research Institute). Among the historical archives, we highlight the Portuguese Overseas Historical Archive which has the overwhelming majority of the maps of Praia and the Plateau. Methodologically, we selected the cartography revealing the development of the urban grid, in the archives referred to above, corresponding to the dates presented in Tab. 1. For the quantitative assessment (size of the blocks and plots) we also obtained the current cartography (2018) from Praia City Council.

The analysis of Praia involved: i) detailed identification of the cartography (Tab. 1); ii) comparative morphological analysis of the urban development based on old and current cartography; iii) vectorisation of the maps by standardisation of scales (the maps were overlapped on the map of 2018); iv) identification of the public buildings and public spaces; and v) quantification of the components of the urban shape. In the quantification of the components of the urban shape, the reading and interpretation of the different maps are summarised by analytical drawings and in tables.

HISTORICAL CONTEXT

The site of Praia de Santa Maria was discovered and frequented by seamen on the crossing of the Atlantic route during the first decade of the 1500s. During that decade, the City of Praia merely consisted of the dispersed shacks of the fishermen installed along the shoreline and around the freshwater spring (Font-Anna), not far from the beach [9], [12], [13]. During the first two centuries of settlement (15th and 16th centuries) Praia was a port for the unloading of slaves [9]. Praia was created by those same slaves, but also by inhabitants of Alcatrazes and subsequently Ribeira Grande. Alcatrazes was a settlement (northern captaincy) of the island of Santiago, which was fairly important on the Portuguese navigation route. This settlement was founded by Captain-Donee Diogo Afonso between 1462 and 1473, at the same time as António de Noli (1415-1497) created the southern captaincy (Ribeira Grande), in the 15th century. By the 15th century, Alcatrazes was already a town with a city hall and a place of worship, the Church of Our Lady of the Light. Due to the paucity of natural resources of Alcatrazes and strong competition from the neighbouring southern captaincy (Ribeira Grande), Alcatrazes began to decline in the 16th century and its captaincy was transferred to Praia de Santa Maria (it is believed that this transfer occurred in 1516). At that time, Praia de Santa Maria already showed some trade potential linked to its port. This potential aroused the attention of the men, interested in the port's business, and later contributed to the transfer of the capital of Cape Verde and Rio de Guiné, based in Ribeira Grande, to Vila da Praia de Santa Maria, in the 19th century [10], [14].

In 1516, Praia Grande absorbed the northern captaincy, transferred from the moribund town of Alcatrazes. In 1777, the settlement of Praia de Santa Maria was officially elevated to the town of Praia de Santa Maria. In 1858, the Town of Praia de Santa Maria was elevated to the capital city of the province of Cape Verde and Rio de Guiné) [15], [9].

As occurred in other Cape Verdean settlements, the first establishment of people of the City of Praia mushroomed around the port, developing later. The settlement of Praia Grande moved to the upland of the Plateau, 30 metres above sea level for reasons of safety and salubrity, when the Church of Our Lady of Grace was built in 1526. [10]. The church was implanted south of the Plateau, overlooking the port of Praia, having been constructed by order of Ribeira Grande diocese under supervision of the Portuguese engineer Pedro Nunes (1502-1578) [16].

The Church of Our Lady of Grace became the first element generating the urban space of the Plateau. Although the Plateau's urban development evolved over various centuries unencumbered by any urban instrument, its layout had been conceived. It shows an urban design displaying desire of orientation and occupation of the upland space, with linear blocks reflecting geometric strictness, adapted to the topography and aligned with the upland's north-south direction [14], [10].

The City of Praia created public services and spaces following its growth and expansion. These urban elements led to the creation of straight layouts that facilitated the ventilation and mobility of the City of Praia. As illustrated in the ancient cartography of this city, despite the difficulties of urban growth and expansion, its initial layout was never abandoned [14], [10].

As the Plateau's urban space swelled, the need for an urban plan became increasingly evident. The first urban plan for the Plateau was presented by Governor António de Lencastre, during his term of office from 1808 to 1813, showing an orthogonal layout [9]. This was an expansion plan that would consolidate the urban grid and did not

change the genesis of the Plateau's urban. This plan introduced new construction rules and encouraged new buildings, improvement of the space of the town of Praia and its infrastructures, with the construction of urban and architectural facilities worthy of a city [9]. For Silva [9], the most interesting aspect of this plan is the delimitation of the lines of the future growth of the town of Praia.

During his governorship between 1822 and 1826, João da Mata Chapuzet (1777-1842) continued the urban improvement and development of Praia finishing a considerable part of António de Lencastre's plan. In the 1850s, Praia's urban development was to a large extent due to the agricultural flourishment of the island of Santiago and the taxes for use of the port [9].

In 1944, the government of António Oliveira Salazar, through the Ministry of the Colonies, created the Colonial Urbanisation Office. This office coordinated a unit of architectural and engineering projects, based in Lisbon, the mission of which was to delineate urban plans for the Portuguese colonies, modernising and homogenising the construction environment of Portuguese works spread throughout the different Portuguese-speaking African countries. In the case of the City of Praia, the New State, as this government was known, consolidated the Plateau's urban grid with the construction of Liceu Domingos Ramos secondary school, in 1960, at the far north of the upland Plateau [17]. The 20th century represents the last stage of growth driven by the Portuguese of the City of Praia through the Urbanisation Plan. Here, various proposals were implemented: Praia Basic Masterplan in 1960, Praia Urbanisation Plan designed by the Architect José Luís Amorim in 1961, and other developments in 1962 and 1969, as shown in Tab. 1 [18].

TABLE 1. Existing maps of the urban centre of the Plateau (Praia) relative to its urban development

Year	Author of the Map	Title	Archive
1840	António Carlos Andrea	Map of the Town of Praya de Santa Maria, and its areas, located on the southeast end of the island of Santiago of Cape Verde [Planta da Villa da Praya de S.ta Maria, e da sua espaçosa Baya, citas na Ponta do S. E. da ilha de Santiago de Cabo Verde] Map of the Port of the Town of Praia de São Tiago of Cape Verde [Planta do Porto da Vila da Praia de S. Tiago de Cabo Verde]	Arquivo Histórico Ultramarino Cartm 024.D130 Arquivo Histórico Ultramarino Cartm 024/00181
1851	-	Mayo, Santiago, Fogo and Brava/Bay of Praya (Santiago Island) [MAYO, SANTIAGO, FOGO E BRAVA/BAIE DE LA PRAYA (ILE SANTIAGO)]	Arquivo Histórico Ultramarino CARTI/ 024/00243
1882	Emídio Augusto de Cárceres Fronteira/ Francisco Assis Camilo Júnior/ Hugo Carvalho de Lacerda Castelo Branco and João Fradique de Moura Palha	Hydrographic map of the port of Praia (Island of São Thiago of Cape Verde [Planta hydrographica do porto da Praia (Ilha de S. Thiago de Cabo Verde)]	Arquivo Histórico Ultramarino Cartm 024/00220
1884	Emygdio Fronteira/ Camilo Junior/ Hugo de Lacerda	Hydrographic map of the port of Praia (Island of São Thiago of Cape Verde [Planta hydrographica do porto da Praia (Ilha de S. Thiago de Cabo Verde)]	Biblioteca Nacional cc-1027-a
1888	-	Cape Verde – Incomplete Map of the City of Praia of the island of São Thiago [Cabo Verde – Planta Incompleta da Cidade da Praia da ilha de S. Tiago]	Instituto Geográfico do Exército
1897	António Vicente Palhota	Map of the City of Praia, indicating name of the main roads, buildings and facilities inside the hospital [Planta da Cidade da Praia, com	Arquivo Histórico Ultramarino CCart000395 (9/666 01)

Year	Author of the Map	Title	Archive
		indicação do nome das ruas principais, edifícios	
1946	-	Map of Praia. Hydrographic Mission of the	Cartoteca Instituto
		Archipelago of Cape Verde [Planta da Praia.	Hidrográfico da Marinha de
		Missão Hidrográfica do Arquipélago de Cabo	Portugal
		Verde]	C_12_6 CIH
1960	José Luís Amorim	Master Plan of Praia [Plano Director-Base da	Arquivo Histórico
		-	Ultramarino
		Praia]	(IPAD 1.146)
1961	José Luís Amorim	Urbanisation of Praia. Preliminary Study of	Arquivo Histórico Nacional
		Cell 1, Main Town [Urbanização da Praia.	de Cabo Verde (Cx 373)
		Estudo Prévio da Célula 1, Achada Principal]	
1962	Jorge Branco Ló	Urbanisation of Praia. Study on the Main Town	Arquivo Histórico
		[Urbanização da Praia. Estudo sobre a Achada	Ultramarino
		Principal]	(IPAD 1.145)
1969	Maria Emília Caria	Urbanisation of Praia. Partial Plan of the Main	Arquivo Histórico
		Town [Urbanização da Praia. Plano Parcial da	Ültramarino
		Achada Principal]	(IPAD PROC.º SU/6/69)

MEASUREMENT OF THE URBAN SHAPE

Figure 1 presents a diagrammatic representation demonstrating the Plateau's urban growth from 1526 up to date, conceived from the cartography under review (Tab. 1) and the interpretation of primary documental sources relative to Praia.

Observing Fig. 1, we find that morphologically this layout is based on an orthogonal grid of regular blocks and that the strongest growth of the urban centre occurred in the 19th century (see drawings relative to 1812, 1840 and 1882).



FIGURE 1. Urban development of the Plateau (from 1526 up to date)

The first phase of implantation of the settlement corresponds to an occupation derived from the movement from the villages of the valleys (Várzea and Praia Negra) to the top of the upland Plateau, after the construction of the chancel (Church of Our Lady of Grace) in 1526. Hence, Fig. 1 only shows the church because although we know there were other buildings [3], we do not have any cartographic elements confirming this implantation.

The Plateau's urban growth was slow between 1526 and 1778, due to the successive years of drought aggravated by frequent pirate attacks. The pirates, in addition to invading the port, would then assail the actual population. These motives contributed to the people temporarily and definitively leaving their homes on the Plateau and moving to the interior of Santiago [3].

In 1770 the transition of the island's administration shifted to Praia by decree of Portugal's all-powerful Marquis of Pombal who endowed it with the status of capital, boosting its development [18].

In 1778 the Plateau had two rows of houses with an empty strip between them, corresponding to Largo do Pelourinho (pillory square), subsequently Praça Alexandre Albuquerque.

In 1812 we find the beginning of the configuration of Praça Alexandre Albuquerque with two rectangular blocks delineating this square to the north. In 1840 the urban centre was larger, fulfilling indications of the Governors António de Lencastre and João da Mata Chapuzet, with Praça Alexandre Albuquerque totally defined, the Central Market space outlined and Praça Luís de Camões constructed.

The Plateau's growth between 1882 and 1968 slumped, becoming consolidated in this last year. However, the unbuilt empty space of the upland did undergo sporadic occupation, especially on the southern side, which were pulled down to make way for the plan's design. From 1968 to the present, the interventions have not modified the constructed grid, with improvements being made to road and pedestrian movement and public spaces.

Figure 2 shows the Plateau's urban grid, the drawing to the left presents the central core at its five stages of evolution and to the right the urban grid with the size of the blocks.

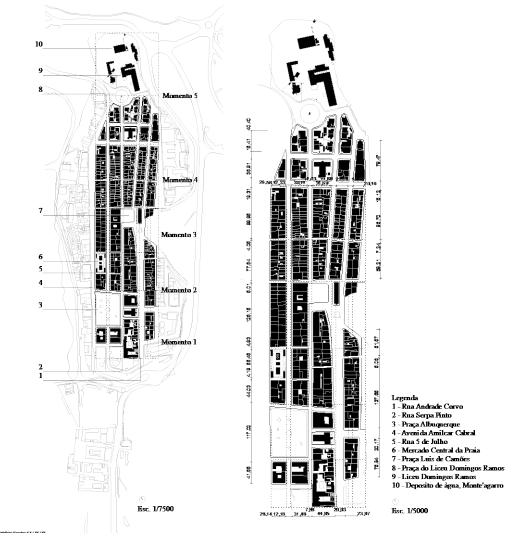


FIGURE 2. Urban Grid of the Plateau (2018) Scale 1:7500 and Scale 1:5000. Key: "Momento" is Stage; 1 to 5 are roads; 6 – Praia Central Market; 7 and 8 are squares; 10 – Water Tower, Monte'agarro

The drawing to the left of Fig. 2 shows that the blocks of the central core consist of two rows of houses, each only facing the road, while the buildings installed along the borders of the upland consist of blocks of only one row of houses, in some cases the houses having a back and front, while in others only a front. As the urban design of the upland's borders have a different configuration, we considered for the comparative analysis only the drawing of the central core.

Stage 1 designed in the map by António Carlos Andreia in 1778 (Tab. 1) is composed of the blocks starting the formation of the core. This consists of 6 blocks that include the formation of the Plateau' first square (Praça Alexandre Albuquerque). This square is rectangular, with its smallest side measuring double the depth of one of the blocks forming the core (107x96 metres). All the rest of the blocks are subdivided into two categories: i) blocks of single plots, for the implantation of public buildings; and ii) blocks of varied plots, intended for private residences. The blocks of varied plots are long and narrow with four fronts. Two facing longitudinally towards the main roads and avenues, and two facing transversally towards secondary roads. The width of the constructed blocks in stage 1 is varied, but very close. The blocks show widths of 26, 31 and 42 metres and lengths of 23, 29, 44 and 114 metres. These lengths correspond to very differentiated configurations of blocks, both concerning single plots (public buildings) and private residences. The plots of the blocks for residential purposes of stage 1 show very diverse widths. The core presents longitudinal roads that are 9 and 12 metres wide respectively and two transversal roads that are 6 and 7 metres wide. The longitudinal roads, Rua 5 de Julho and Avenida Amílcar Cabral, are structural of the urban core at this stage, linking the Plateau from north to south, where the latter is the backbone of this urban design as all the other longitudinal streets that emerged run parallel to it. Although Rua Serpa Pinto represents the central axis of the composition at stage 4, Avenida Amílcar Cabral never loses its importance due to its width and functionality.

At this and other stages, there are blocks with backyards, some open and others occupied with outbuildings. The aerial and ground-based photography testify to the occupation of these backyards at a later date, with the drawings presented in Fig. 2 and 3 corresponding to their current occupation. It was not possible to identify the dates of occupation of these backyards due to lack of records.

Stage 2 relative to 1812 and the map of 1840 (Tab. 1) is composed of 9 blocks implanted to the north of the existing settlement. This development is more balanced in terms of size of the blocks. The configuration of the blocks is identical to that of the older blocks of stage 1, continuing to be long and narrow with four fronts. The four blocks are aligned with the previous accompanying the main roads and avenues. At stage 2, the blocks 28, 29 and 48 metres wide and 44, 52, 55, 78, 108 and 137 metres long. The plots of the blocks for residential purposes at this stage show greatly varying widths, ranging from smallest of 5 metres and a large number of plots of around 17 metres' wide. At this stage of development of the settlement, a secondary road emerges where the first commercial space is built – the Plateau's Central Market. This space occupies a single block of 55 x 30 metres, with two main fronts and two secondary fronts. One of the main fronts faces Avenida Amílcar Cabral and the other a pedestrian street, Rua 5 de Julho, with this street being around 15 metres wide at this stage and narrowing to 14 meters at the following stage.

Stage 3 refers to the maps of 1840 and 1851 (Tab. 1). At this stage, the blocks maintain the foundational geometry of the settlement, but more importantly show the formation of a second square – currently Praça Luís de Camões (Praça dos Governadores) – with a size of 52 x 55 metres and characterised by an architecture of the type of the old Treasury building. With the design of this public space, Rua Serpa Pinto gains a structural role as it henceforth links Praça Luís de Camões to Praça Alexandre Herculano of stage 1.

Here the residential blocks show widths of 109 and 126 metres and lengths from 20 to 35 metres. The plots of one of the blocks have very similar geometries and sizes (the highest number with the front of the plot of the block being approximately 7 and 14 metres), close to the configurations of stage 4.

Stage 4 corresponds to the maps of 1882 and 1946 (Tab. 1) where it is possible to observe a proposed design for the completion of the urban settlement to the north, which was not yet constructed at that time. Then ten residential blocks which materialised during this stage show a more regular geometry, with lengths of 77 and 100 metres and widths between 20 and 35 metres, the plots being of similar sizes (the highest number with the front of the plot of the block being approximately 5 metres). It is important to highlight that in relation to the public space the roads acquire widths that are closer to one another in an open grid hierarchy (the longitudinal continuing to be wider, between 6 and 9 metres, and the transversal narrower with a width of 4 metres).



FIGURE 3. Urban grid of the Plateau at its 5 stages of development (2018)

Stage 5 refers to the 20th century, when the core settlement was consolidated with the construction of the secondary school, in 1960 (Fig. 3). The northern part of the Plateau was built on after the 1940s lending continuity to the same system of urban composition. The central blocks emerge extending the urban grid and the blocks of the upland's borders adapt to the topography of the site. With the completion of Praça do Liceu (secondary school square), Rua Serpa Pinto henceforth links three important public spaces (the town's three main squares). The last blocks to be built have similar widths to the previous (44, 32 and 22 metres) as they arise in their continuity, but

show shorter lengths (the most regular being 37 and 44 metres). The far north of Praça do Liceu does not portray a block structure, although the buildings maintain an implantation parallel to the secondary school.

CONCLUSION

Through primary sources (cartography of Praia) consulted in various archives, we were able to record the evolution of the Plateau's urban grid. This urban settlement was planned by different players, in particular António de Lencastre and João da Mata Chapuzet. The first urban plan for the Plateau, presented by Lencastre, is a regular, original and futuristic plan, foreseeing the expansion of the core (drawing of the map of 1882). In this plan, street layouts and squares are designed like in other Portuguese urban plans of the 19th century, organising the structure of the public spaces only at the level of the blocks, with no definition of the architectural typologies of these spaces and no standardisation of the size of the plots.

During the 19th and 20th centuries, we found a continuity of the Plateau's urban design expressed in five stages that mark the settlement's urban development. During the first three stages of this development, there is in particular the design of the longitudinal blocks with very similar widths and varied lengths; at stage 4 (1882-1946), greater uniformity of blocks, with lengths of 77 and 100 metres and widths between 20 and 35 metres, and plot fronts of approximately 5 metres; at stage 5, in 1960, definition of the structure of public spaces with Praça do Liceu, and Praça Alexandre Albuquerque (stage 1) and Praça Luís de Camões (stage 3), linked together by Rua Serpa Pinto. From 1960 onwards, the Urbanisation Plan as a legal document imposes rules to new interventions in the Plateau, but also defines the urban design in terms of public spaces and the residential blocks, giving priority to the space of public use.

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