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*THE USE OF LANDSCAPE UNITS  
AS A METHODOLOGY TOOL  
FOR THE OPEN SPACE  
SYSTEM ANALYSIS*

ABSTRACT

This paper presents a study on the urban form, landscape and open spaces of Patos de Minas, an average city of Minas Gerais ? Brazil. Searching to understand the configuration of the Open Spaces System by applying the methodology of Landscape Units. The Landscape Units in this paper are used as identification tools and analysis of different territorial portions formed by the prevalence of morphological characteristics, landscape and interaction between open and built spaces, aiming to highlight the strengths and weaknesses of each unit that can be applied to urban and environmental planning. This approach allows to develop a systemic view of the urban structure in which it is observed, not only the sets of open spaces, but also their interactions and connections with the buildings, with society, with the physical support and urban form.

KEYWORDS

Open spaces. Open spaces system. Landscape units. Urban form.

EL USO DE LAS UNIDADES DE  
PAISAJE COMO HERRAMIENTA  
METODOLÓGICA PARA EL ANÁLISIS  
DEL SISTEMA DE ESPACIOS LIBRES

O USO DAS UNIDADES DE  
PAISAGEM COMO FERRAMENTA  
METODOLÓGICA PARA ANÁLISE  
DO SISTEMA DE ESPAÇOS LIVRES

RESUMEN

Este artículo presenta un estudio sobre la forma urbana, el paisaje y los espacios abiertos de Patos de Minas, una ciudad media de Minas Gerais – Brasil, tratando de entender la configuración del Sistema de Espacios libres mediante la aplicación de la metodología de Unidades Paisaje. Las Unidades de Paisaje en este trabajo se utilizan como herramientas y análisis de porciones territoriales formadas por la asociación individual o sistémica de los diferentes tipos de espacios abiertos, características morfológicas y el espacio construido de identificación. Este documento tiene como objetivo presentar esta aplicación metodológica, sus resultados y las preguntas que surgieron en medio del proceso de análisis. Este enfoque permite desarrollar una visión sistémica de la estructura urbana en la que se observa, no sólo los conjuntos de espacios abiertos, sino también sus interacciones y conexiones con los edificios, con la sociedad, con el hardware y la forma urbana.

PALABRAS CLAVE

Espacios libres. Sistema de espacios libres.  
Unidades de paisaje. Forma urbana.

RESUMO

Este trabalho apresenta um estudo sobre a forma urbana, a paisagem e os espaços livres de Patos de Minas, uma cidade média do estado de Minas Gerais, Brasil. Buscando compreender a configuração do Sistema de Espaços Livres por meio da aplicação da metodologia das Unidades de Paisagem, que neste trabalho são utilizadas como ferramentas de identificação e análise das diferentes porções territoriais formadas pela predominância de características morfológicas, de paisagem e de interação entre os espaços livres e edificados, objetivando ressaltar as potencialidades e fragilidades de cada unidade que podem ser aplicadas ao planejamento urbano e ambiental. Essa abordagem permite elaborar uma visão sistêmica da estrutura urbana, na qual se observa não apenas os conjuntos de espaços livres, mas também suas interações e articulações com o edificado, com a sociedade, com o suporte físico e com a forma urbana.

PALAVRAS-CHAVE

Espaços livres. Sistema de espaços livres.  
Unidades de paisagem. Forma urbana.

## I. INTRODUCTION

The study aims to analyze the process of setting up the Open Space System (SEL) of the city of Patos de Minas – Minas Gerais, through the systemic relations between the open spaces and the interaction between the urban form with the city landscape. It is part of the dissertation developed at the Architecture and Urbanism Postgraduate Program – PPGAU of the Architecture and Urban Design School – FAUeD, of the Federal University of Uberlândia.

This paper is part of the QUAPÁ-SEL network (Board of Landscaping ? Open Space Systems), coordinated by the LAB-QUAPÁ of FAU (Faculty of Architecture and Urbanism of the University of São Paulo), whose main objective is to understand the contemporary procedural relations between the Open Spaces Systems and the urban form of Brazilian cities. The work presented here is also part of the studies conducted by the Center for Urban Studies (NEUrb) of FAUeD, which aims to expand the research in the field of urban morphology and open spaces of the medium cities in the Triângulo Mineiro and Alto Paranaíba (MG) regions, thus contributing to the study of the national group QUAPÁ-SEL.

The research understands as Open Space all space without buildings. This approach goes beyond the usual designation of green areas, considering not only the environmental function of these spaces, ranking as open spaces also non vegetated environments, stage of social and cultural appropriations, political demonstrations, economic activities, of sports and leisure; therefore, taking in account the complexity and diversity of uses that open spaces include.

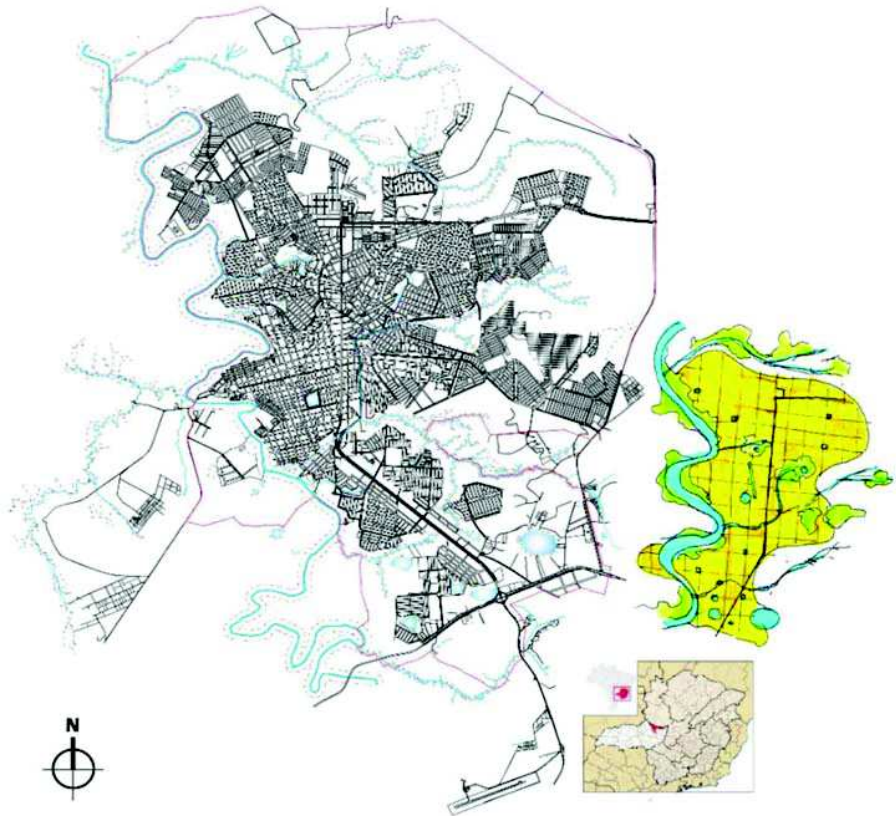
The study allows developing a systemic view of the urban structure, in which it is observed, not only the sets of open spaces, but also their interactions and joints with the built space, the urban fabric and the Landscape Units (U.P.). The paper understands the Landscape Units as portions of the urban fabric, in which morphological characteristics and the relations between the open spaces and the built ones have centrality, hierarchy, distribution and organization specificities that distinguishes them from other sets of relations.

The studies carried out on the SEL of Patos de Minas, in the course of the paper, were made in the city scale, aiming to present all the joints of the system within the city cut. While in the Landscape Units analysis, the assessments were made in the vicinity scale, showing the specificities and appropriations that take place in open spaces of each unit. I.e., the morphological analysis of the city open spaces, in the paper in question, went from macro to micro. The application of the Landscape Units methodology allows to transit between the scales of analysis and delve into the characteristics and peculiarities of the open spaces found in each unit.

## 2. THE URBAN FORM AND THE LANDSCAPE OF PATOS DE MINAS

Patos de Minas is a medium-sized city in the intermediate region of the Mesoregion of Triângulo Mineiro and Alto Paranaíba. It is located in the Central Plateau, Minas Gerais/Goiás, with average altitude of 800-900 meters. It is located between two Brazilian river basins: the São Francisco and the Paraná. Its strategic location allows the connection of the city to commercial centers as

Figure 1: Urban Form of Patos de Minas - Minas Gerais. Source: Maps of the Patos de Minas City Hall, 2015. Sketch prepared by the author.



Uberlândia, Belo Horizonte, Brasília and São Paulo, facilitating trades and economic development.

The occupation process of Patos de Minas municipality started probably in the middle of the eighteenth century, even before the discovery of gold in the state, with the flags towards the lands of Paracatu. The city of Patos de Minas came in the second decade of the nineteenth century around the Lagoa dos Patos (Ducks Lagoon), where according to historical descriptions there was a huge amount of wild ducks. According to Oliveira Melo (1971), in 1826 the Silva Guerra couple donated land for the construction of a temple to Saint Anthony, from then, several families settled in the proximity of the chapel, starting the village. The Lagoa dos Patos is an element that was part of the Open Spaces System, characterizes the identity and history of the city, however, the growth of the urban fabric and the urbanization process have caused the lagoon to disappear from landscape.

The town starts on the banks of a pond in a flat land consisting of Brazilian savanna, between the Paranaíba River and local streams, a land with good availability of water resources and favorable to agriculture. Since its formation the urban network was linked to hydrography and green areas, these natural elements directed and limited city planning, urban form, the categories of open spaces and the urban landscape.

In Patos de Minas the urban landscape is framed by mountains covered by different crops, the urban area is bordered by the Rio Paranaíba, by the streams and the valley bottoms. The landscape is also noticed by the Cathedral in the central portion of the city, marking the beginning of the occupation of the region,

<sup>1</sup> LYNCH, K. *A imagem da cidade* (1960). ALEXANDER, C. *Um language de patrones* (1980). RAPOPORT, A. *Aspectos humanos de la forma urbana* (1978). TUAN, Y. F. *España e lugar* (1983). GREGOTTI, V. *Nuevos caminos de la arquitectura italiana* (1969).

in a flat area on the sides of the lagoon; today the plateau was almost entirely occupied and the neighborhoods of urban edges occupy the highest areas of the city. From the top of these neighborhoods it is possible to see the ponds and streams present in the city, spaces that are configured as parks, squares and small farms, spaces free of buildings that highlight the city's identity and landscape.

Patos de Minas landscape besides characterizing the city identity due to their physical attributes, has a landscape and environmental potential that needs to be incorporated into the city idealization for sustainable urban planning. Understanding the concept of urban landscape is the main focus of the research, to assimilate the urban setting, the incorporation of elements of physical support in the formation and transformation of urban form and understanding of the role of Open Spaces System in the city.

There is no consensus on the concept of landscape, the discussion moves through different areas with different settings, emphases and approaches. According to geographer Bertrand (2004), perspective differences in landscape concept are influenced by the formation and objectives of the observer and can emphasize: vegetation, hydrography, climate, relief, economy, architecture or historical process. The analysis methodology may be: time, based on the physical aspects and refer to relations and internal dynamics, or even a set of various analyzes. That is, the individual perception added to the objectives and the observer's focus affect directly in the landscape reading and the concept of it.

According to Maximiano (2004), for some sociologists and economists the landscape is the basis of the physical environment in which man uses and transforms, or not; for some botanists and ecologists the landscape is a set of organisms on a physical environment, which properties can be explained according to laws or models, with the help of physical and/or biological sciences; to some geographers it results from the dynamic relation of physical elements, biological and anthropic.

The landscape study began to gain relevance among architects in the year of 1960. According to Sandeville (2006), this process can be illustrated initially by the work of Kevin Lynch, Christopher Alexander, Amos Rapoport, Yi-Fu Tuan and Vittorio Gregotti. According to Gregotti<sup>1</sup> (1983), the understanding of the landscape is a tool that the architect has to have at hands to analyze the place and space on which to design. However, the landscape understood only as a set of physical and geomorphological characteristics, of biological and mineralogical nature is not enough to prepare the project, it is necessary that the landscape reading express everyday actions, the uses of space and the local culture.

In Brazil, Miranda Magnoli begins her studies of the landscape and the environment in the 1970s, based on US analysis of landscape planning, recognizing the importance of socio-spatial characteristics, but without reducing the landscape to the formal aspects. According to Magnoli (1982), the landscape morphology is understood as resulting from the interaction between the logic of support processes (geology, climate, soil, relief, vegetation and sun, water and wind) and the logic of social and cultural anthropogenic processes (lot outs, excavations, crops, constructions, buildings). The morphological features of the landscape, give specificity to the location, and the landscape configuration (both support processes and anthropogenic processes) influence directly the organization, coordination and the types of open spaces found.

This paper considers the landscape as something that characterizes the city, which gives it identity and distinguishes it from others. The landscape portrays the urban form and culture of the population, the way people build their homes and where they build; on the riverside, high in the mountains or on plateaus. It is the local history told through the changing landscape and architectural standards: the houses that remain since the neocolonial period or in the eclectic style, the houses that have arisen in modern style, in the renovations, buildings that are listed and those who are demolished. The landscape is told through the trees, the flowers planted and replanted on the sidewalks; sidewalks sometimes mended. The landscape is a reflection of the social process, the neighborhoods that form, people who move, the economy that develops modifying the commerce, installing new industries and perhaps even industrial neighborhoods, generating income for urbanization of new areas or the verticalization of others.

The study sought to understand how the morphological features of the landscape are present in the urban fabric and in the configuration of open spaces in medium-sized cities, and if there are specific elements and characteristics of this joint in medium-sized cities.

### 3. THE ROLE OF OPEN SPACES IN MEDIUM-SIZED CITIES

The research proposal is not to discuss what determines a city as medium-sized or not, but understand these cities as urban centers in growth, where new lines and urban transformations are added to the existing city, boosting the local landscape.

*Medium size cities occupy a strategic position within the urban hierarchy, especially because they play a key role in the regional planning. They provide support to small cities, according to the function they perform, and establish liaisons with major cities, intermediating relations between these two urban levels. They are spaces of relationships, not of polarization or domination, cities not so small as to limit the possibilities of economic and intellectual growth of its inhabitants, and not so large as to encumber – and even jeopardize – the life of most of its residents. (AMORIM FILHO; SERRA, 2001, p. 3).*

Patos de Minas is an example of an average city in growth, which receives cultural and morphological patterns influences; a city that has specific features of its physical support, its historical process and culture, which directly influence the urban grid, in open space typologies and types of appropriation of these spaces.

The open space is a structuring part of the urban form, and is configured in different categories, types and characteristics in urban areas, especially through the introduction throughout history of different urban patterns in cities. The process of urbanization of cities is a sum and sometimes an overlap of morphological patterns; these paths create different landscapes with different types of open spaces. Incorporated to the system a rich spatial mosaic, formed by different percentages of intra-lot open spaces characteristic of different traces for different types of squares, conservation areas, parks, streets and avenues. Areas that present these multiple conflicts and have a strong potential for transformation.

*is understood as open spaces systems (SEL) urban elements and relationships that organize and structure the set of all open spaces of a given urban cut, regardless of its size, aesthetic and functional qualification, and its location and property, whether public or private. [...] every city has an open space system that is produced during its shaping process both by the Government and private sector (MACEDO, 2010, p. 3-4).*

The author states that all cities, regardless of its size, its cultural and historical characteristics have an Open Spaces System. This statement prompts several questions which led the research, these questions focused on the object of study, the city of Patos de Minas, a medium-size city:

- The SEL of a megalopolis or metropolis is different from the SEL of a small town, or of a medium city?
- The same type of analysis that applies to understanding the SEL of a large city can be applied to a medium-sized city?
- There are types of open spaces, functions or relationships that characterize the Open Spaces System of an average city?

According to Macedo, et al. (2012), Brazilian cities have similar morphological patterns, this is evident in the repetition of types of trace (orthogonal, irregular, organic, radial, etc.) and urban sprawl patterns (linear, tentacular, compact, mixed, etc.). What gives the specificity of the various cities is how they operate in their territorial context, spatial arrangements, their cultural, socio-economic standards, the municipal legislation, the types and functions of open spaces and the urban landscape. In medium-sized cities the ways that the morphological patterns suites to the physical support, transforming the local landscape, gives the SEL different spatial dynamics, functional and typological.

The Open Spaces System needs to be thought and understood as a basic infrastructure for the performance of the urban everyday life. According to Souza and Macedo (2014), the SEL should offer conditions of urban livability and for this it is necessary to establish a diagnosis based on the presence or absence of a number of necessary and qualitative urban attributes that should guide actions, policies and projects to form a system of open spaces integrated to the local landscape and to the demand of the population. The author states that it is necessary to make reading of the city, its constraints, conflicts and potentials to understand how to structure the SEL and its potential for transformation and organization in the city.

#### 4. THE CATEGORISATION AND THE SYSTEMIC RELATION OF OPEN SPACES

To assist the analysis of systemic relationships of open space types, or typologies, of open spaces identified in Patos de Minas they were grouped into categories. The definition of the categories has been prepared based on NEURB-FAUeD/UFU data in the Single Table prepared by QUAPÁ-SEL and the Open Spaces Categories Tables of SEL-RJ Group. Such studies present and classify various types of open spaces identified in Brazilian cities, this paper selects from the tables that based the study only the open space typologies that have been identified in Patos de Minas.

The categories of open spaces identified in the city assorted places that have a predominance of: same function performed in the city (recreational, sporting, environmental, circulation, etc.), similar types of land use (residential, commercial, industrial, etc.), predominance in the type of land ownership (private / public, private collective use and special use of public), and similar location (urban or rural).

In Patos de Minas were identified six categories of open spaces, which are presented in Table 1 below:

Table 1: Categories and Types of Open Spaces present in Patos de Minas. Source: Authors.

<b>OPEN SPACES CATEGORIES</b>	<b>TYPOLGY</b>
Environmental	Water bodies, APP's, Woods and Reserves, Flooded Areas.
Social practices	Clubs, Soccer Fields, Condominium Spaces, Squares (Contemplation, Sport, Mixed, Not Implemented), Parks (Recreative, Preservation, Theme, Mixed).
Of Circulation	Alleys, Streets and Avenues, Parking, Rights-of-way, Central Flowerbeds, Interchanges and Roundabouts.
Of urban infrastructure	Reservoirs and Water Treatment Plants (E.T.A.) Sewage Treatment Plants (E.T.E.), Landfill, Dumps, High Voltage Lines.
Associated with buildings and entities of public service	Administrative Center, Institutional Area, Universities, Airports, Military Areas, Cemetery.
Related to rural environment	Cultivation Areas and Field, Pastures and Livestock, Sites, Farms and Ranches, Farms Condo, Mineral Extraction Area.

The category of environmental character open spaces is formed by free spaces linked to the physical support of the city, to the hydrography and vegetation. They are spaces that have in common the function of environmental protection of green areas and ecosystems, but can be associated with other functions such as recreation, contemplation and circulation. The open spaces in this category are protected by environmental legislation CONAMA (National Environment Council) 302 and 303 of 2002 and by the Brazilian Forest Code.

The category of open spaces for social practices covers spaces for leisure, entertainment, sport and recreation. The classification of subtypes for the types of squares and parks to better characterize the SEL was required. Among the city were identified squares of: sports (with the presence of courts), contemplation (spaces to stay) and of mixed use (sports use and contemplation) and not implanted squares. Among the parks subtypes have been identified: recreation, preservation, mixed and theme.



The category of circulation spaces is formed by types engaged in the movement function of people, vehicles and urban mobility, are spaces belonging to the road system (streets, avenues, boulevards, alleys, roads, highways and flowerbeds), are distributed throughout the SEL, defining and leading the urban form. The street is the space of flows and appropriations, recreation site, sports, stage for serenades and follies of kings, space for fairs, civic parades and religious, for political and cultural events.

The category open spaces associated with urban infrastructure assort spaces for infrastructure (mainly water, sewage, drainage, solid waste, electricity and telecommunications) and the use of soil is predominantly industrial and service. Although the road system is an element of urban infrastructure, the spaces related to it were grouped separately (open spaces associated with the movement), due to the complexity of the functions and uses they play in the city.

In the category of open spaces associated with buildings and public service entities, the spaces have the same land soil situation, are predominantly intra-lot open spaces of institutional areas (schools, kindergartens, health centers, city halls, among others).

The category open spaces related to rural areas was defined by the location of free space that is predominantly outside the urban fabric although not necessarily in the countryside, and for presenting activities related to agriculture.

Open spaces of different categories may be connected physically or symbolically through cultural, social, economic or political relations. According to Queiroga (2011), the physical connection is only one of the ways of relationships between free spaces; they are connected systemically through cultural, hierarchical relationships, ownership types and primarily are related according to the role they play in the system (environmental, infrastructure, movement, leisure).

In the Open Space System of Patos de Minas various relations between the spaces were observed: some are physically connected by the road system, some can be grouped and related because they have similar characteristics (same type of spatial conformation, furniture, layout, landscaping) others to exercise the same kind of function (sports, recreational, conservation, contemplation), or the same type of ownership; by having the same type of management; or submit the same condition; some spaces by having the same type of relationship with water, with vegetation or with the built environment.

The more systemic relations an open space exercises, that is, the more it is connected with others, the greater its degree of centrality and scope within the SEL and higher its hierarchical importance.

Each type of open spaces in this city establishes systemic relations within its own category in which it belongs and to other types of other categories. Figure 2, below, illustrates this situation.

Looking at Figure 2, the type of open spaces of water bodies is physically connected, through legislation or on its environmental function with APP's environmental reserves and forests, that is, within the categories of environmental character spaces the water bodies perform a central role. These also establish relations with other categories of open spaces: as parks, because almost all city parks have ponds and streams; with the road system, physically connecting the urban fabric with the hydrographic system of the region; with E.T.A. and E.T.E. through urban infrastructure functions; with free spaces related

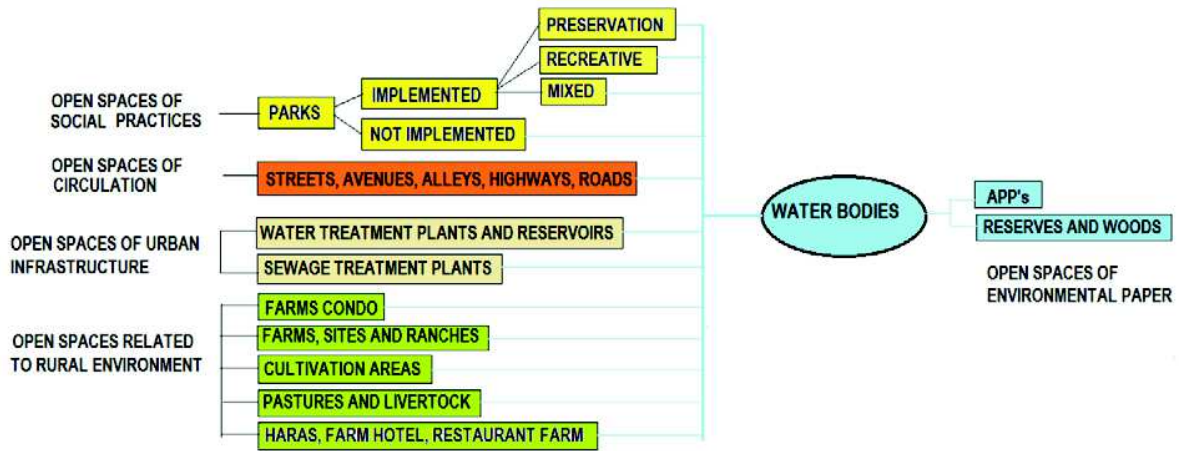


Figure 2: Systemic Connection of Water Bodies in Patos de Minas. Source: Authors.

to rural areas, through leisure functions, the water catchment for irrigation and maintenance of flocks and physically, because rural areas are most valued when near water resources.

As the water bodies establish systemic relations, other typologies present in the city do it as well. However, an open space not necessarily set all these connections simultaneously. The typology of the water bodies in Patos de Minas, for example, is made up of several different streams, ponds and by Rio Paranaíba; each stream establishes different systemic relations that vary according to the morphological configuration and landscape in which it is inserted; as illustrated in Figure 03.

This paper understands that the sets of relations between the city's open spaces show the configuration of the urban fabric, the SEL portions in which relations between open and built spaces have specific characteristics of centrality, hierarchy, distribution and organization that distinguish it from other sets of relationships and characterize an area and its surroundings. Figure 4 illustrates schematically these various sets of systemic relationships that form the SEL of Patos de Minas.

The Landscape Units in this work are used as methodological tools to identify territorial portions that are characterized by the individual or systemic association between open spaces typologies, morphological features and the built space.

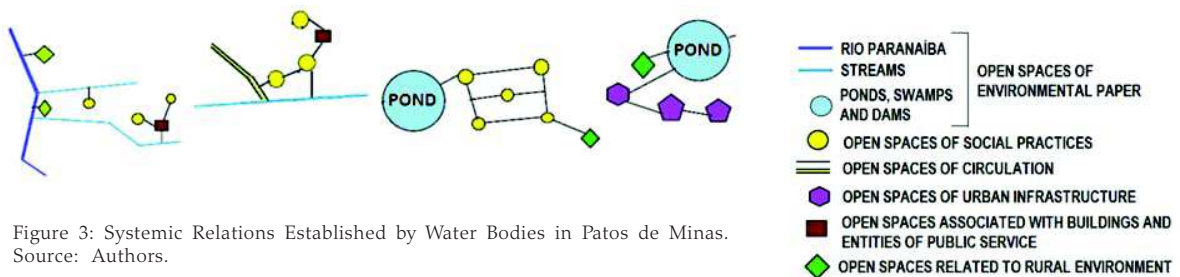


Figure 3: Systemic Relations Established by Water Bodies in Patos de Minas. Source: Authors.

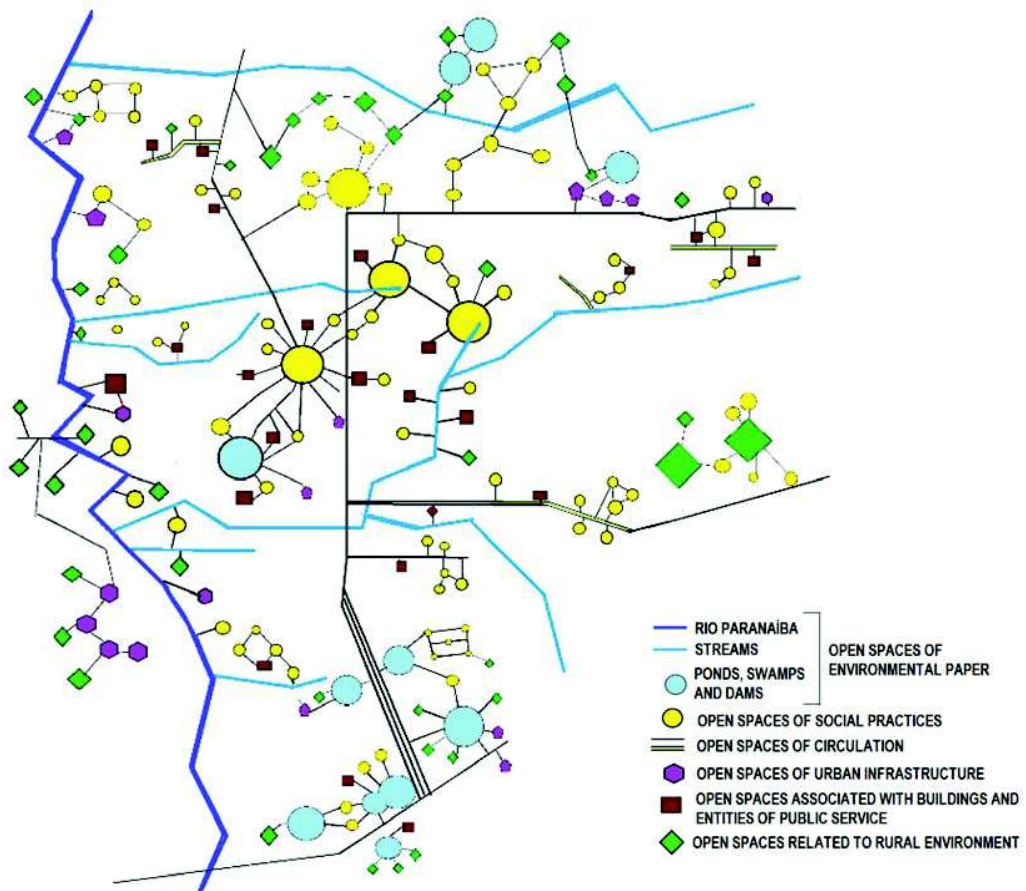


Figure 4: Systemic Relations Between the Open Spaces of Patos de Minas. Source: Authors

## 5. THE LIMITS OF LANDSCAPE UNITS

It is understood as Landscape Units (U.P.) a territorial portion of the city where there is similarity between them, determined by physical, natural or anthropogenic factors. Each unit has its own morphological characteristics, such as: track, use, occupancy, template and mainly systemic relations between the open spaces, these features added to the physical support give the Landscape Unit unitary character, in order to create different zones and characteristics in the urban space.

The Landscape Units assist in the analysis scales transition process starting assuming the city as a whole and SEL, for a closer analysis of the street and neighborhood scale, showing the sets of relationships between landscape and open spaces in each morphological unit.

For delimiting the U.P. were made some analysis and mapping in the city scale showing the configuration of urban form and its open spaces, the analysis was divided into three main approaches: the first shows the ECOLOGICAL RELATION featuring environmental support of the city (identifying valley bottoms, hydrological elements, APP's, reserves). The second approach reveals the SPATIAL CONFIGURATION of the urban fabric (consolidated and in

consolidation process, expansion vectors and vertical); the inclusion of the free spaces in the urban fabric (inserted fabric, spaces whose formal organization independent of the fabric, forming spaces/modifiers of the fabric, formed from fabric scraps or the road system or from blocks of unions) and the types of fabrics present in the city (regular orthogonal, orthogonal irregular, irregular and organic). And the third approach reveals the SOIL USES RELATION (residential, commercial, industrial, services and mixed use) and land distribution (public and private).

After this mapping configuration urban fabric and its open spaces some areas showed the same groups of characteristics, for example: areas of consolidated fabric with irregular course had more open spaces formed from the road system remains and rugged topography. Many parts of the fabric in the consolidation process have regular orthogonal layout, free spaces inserted in the fabric and most of them not implanted, are disinclined areas with large voids and residential predominant use. The areas occupied by valley bottoms also had similarities by the fact that they are outside of the urban area, delimiting the fabric through topographic dimensions with slope greater than 30°, having free spaces associated with rural activities and are possible city expansion vectors. These areas with similar characteristics assisted in the identification of types of Landscape Units and prime delimitation.

After identifying the possible types of U.P. present in Patos de Minas, was pursued a more detailed definition, creating subdivisions of pre-identified units and better defining the physical boundaries of these units, for example: the area predominantly formed by the regular orthogonal layout was divided into two types of U.P.: a type formed by densely populated residential areas with low urban trees, much of which areas of social housing (UP3); and other formed by low densely areas, due to the presence of many vacant lots and more intra-lot open spaces (U.P.4).

The criteria that helped distinction and delimitation of Landscape Units were: the size of the streets, the trees, the template, the degree of consolidation of the area, the size of blocks, the lot size, the type of track, the slope, the presence of water courses, the occupancy rate and land uses.<sup>2</sup>

Regarding the open spaces the following standards for the identification of Landscape Units were observed: systemic relations, distribution of open spaces in the city as well as the concentration of some typologies in certain territorial portions, the area of influence of the free spaces, types of ownership and the spatial conformation patterns among open spaces and built spaces.

In Patos de Minas ten Landscape Units were identified, from the understanding of the interaction of urban form with physical support, the survey of several morphological characteristics present in the city and the understanding of the role of the free spaces in the local landscape. Figure 05 illustrates the presence of such units in the urban form.

Table 2 below presents the morphological characteristics that distinguish Patos de Minas units and the strengths and weaknesses of the identified Landscape Units:

Some of the Landscape Units identified in Patos de Minas can be found in several Brazilian cities. For example, the U.P.1 characterized by being a vertical central area; the U.P.3 gathers city portions specified as HIS (Social Housing);

<sup>2</sup> The observed morphological elements were defined and standardized as evaluation criteria of urban form from the research developed at NEUrb (Center for Urban Studies) – FAUeD / UFU.



Figure 05: Representation of Landscape Units in Patos de Minas.  
Source: Authors.

the U.P.6 corresponds to the allotments in the implementation phase. These three examples of Landscape Units, the U.P.1, U.P.3 and U.P.6, despite their morphological characteristics similar to several Brazilian cities have local specificities of the landscape in which they are inserted.

The identification of characteristics of a determined U.P. can guide the actions of urban and environmental planning. According to Silva (2012), the Landscape Units carry a specific reading that reveals the existing urban form and its trends, making it possible to identify the degree of impact: of management, of public programs and actions and the effects of landscape transformation. When the author highlights the trends of the urban form he mentions the dynamics of transformation, such as: the vectors of urban expansion, intended to divide an area, the verticalization trend an area induced by a given urban legislation, the possibility of implementation of parks, among others.

It can be seen throughout the presentation of the Landscape Units that each has specific strengths and weaknesses that indicate possible intervention guidelines for these areas. And the quality of open spaces, mainly public, are the main components of qualifications or the requalification of the city Landscape Units. The strengths and weaknesses of the units show that different morphological characteristics, social and interaction of open spaces require different actions of urban and environmental planning.

Table 2: Conflicts and Potentials of Patos de Minas Landscape Units.<sup>3</sup>  
Source: Prepared by the author.

Morphological Characteristics	Potential and Weaknesses of Units
<b>U.P.1</b> Commercial and city services center. Irregular orthogonal layout, high rate of densification, more verticalized area of the city. Presence of several small squares.	Region where is found the greatest appropriation of open spaces in the streets and squares of typologies.
<b>U.P.2</b> Formed by the area surrounding the city's commercial center, a territorial portion that was once considered the edge of the city in the mid-twentieth century. Irregularly shaped streets and steep topography.	Municipal Park of Mocambo and João Luiz Redondo Municipal Park, both with the presence of lakes and streams; despite the great landscape potential the parks receive low maintenance and need rehabilitation projects.
<b>U.P.3</b> Unit with high population density. Presence of the living areas of social interest. Low intra-lot free spaces and the presence of many not implemented squares.	Implementation of squares promoting various activities and uses to meet the population demands.
<b>U.P.4</b> Consolidated areas of regular orthogonal layout, with low presence of urban forestry and residential predominant use. Are areas near to water bodies, but with little connection to them.	Needed the implementation of squares and awareness of the necessity for urban trees.
<b>U.P.5</b> Urban area closest to Rio Paranaíba.	Great landscape potential. Problems with irregular occupations in the APP, floods, overflows, illegal dumps and sewers.
<b>U.P.6</b> Areas in the consolidation process have the basic urban infrastructure, but still do not show many built spaces.	Possibility to implant open spaces categories focused in the needs of the population and the physical characteristics of spaces.
<b>U.P.7</b> It offers different types of land use, templates and landscape features. The unit is formed by industrial neighborhoods, roads concentrating workshops sheds, body shops, bus companies and heavy vehicles and some residences.	Parks areas not implanted: Córrego Estreito Park and Lagoa do Patão Park. It is observed the incorporation of some ponds to the industries areas and private farms. Areas with great landscape, close to the ponds, which can be configured as urban parks.
<b>U.P.8</b> It covers an open and two closed allotments, both of wide streets and lots with more than 400 m <sup>2</sup> , unit predominantly occupied by a population of upper-middle class.	The Exhibition Park has the potential to permeate between the public and private spheres. Enabling meet a larger share of the population.
<b>U.P.9</b> Area in occupation process aimed at upper class. Located between reforestation areas, farms, streams and impoundments.	Proximity of APP and Legal Reserves. There are intrusion problems in the areas of environmental protection and arson. A environmental education work and the structuring of the transition areas between the forest and the urban layout is required.
<b>U.P.10</b> Non-urbanized areas present in the surroundings of the urban area. Much of the Unit 10 area is within the city's perimeter, areas that will receive the expansion of the urban fabric.	Urban expansion vector to the north due to implementation of a campus of the Federal University of Uberlândia. Many APPs and legal reserves, with: pastures, plantations, farms and farm condominiums.

<sup>3</sup> The categories and their open space typologies were identified in Tables 6 to 11, drawn from the NEURB-FAUeD/UFU data, in the Table of Open Space Categories of SEL-RJ Group (Campos, et al., 2012, p. 232-239), presented in Annex I and the Single Table prepared by QUAPÁ-SEL (Campos, et al., 2012, p. 230-231), presented in Annex II.

## 6. FINAL CONSIDERATIONS

The appreciation of the Open Spaces System of Patos de Minas and its importance in the urban fabric configuration showed problems like the lack of the concept of SEL by the urban planning; the current difficulties of management and maintenance of open spaces; the disparity of scale and quality of the public and private open spaces; the absence of programs that encourage urban tree planting, environmental awareness and appreciation of the local landscape features and the lack of planning and integrated management of open spaces. The implementation of public open spaces depends on an adequate and integrated resource management and effective supervision, which implies the development of permanent public policies that support interventions and needs of open spaces.

The methodology Landscape Units identification was used as a tool for analyze sets of relation between open and built spaces in different morphological configurations of the city. The application of this methodology generated at baseline some doubts: the identification of Landscape Units is the basis for identifying the SEL or from the understanding of it is possible to delimit the U.P.? What comes first: the analysis of the Open Spaces System or the analysis of Landscape Units? These doubts arise because the Landscape Units help understanding the SEL and this helps to understand the Landscape Units, both added to the features of the urban landscape.

The paper may help in the process of classification and delimitation of Landscape Units in other cities, particularly medium-sized cities that have characteristics similar to those found in Patos de Minas. Moreover, the work allows comparative studies capable to show different applications of the methodology of U.P. to the different configurations of Brazilian cities.

The delimitation of Landscape Units is not static. The process of city urbanization can generate new Landscape Units, incorporate new areas to existing units, or even it may suffer different pressures (verticalization of densification, real estate depreciation) contributing to different changes in its scenery, which can result in the rearrangement of the Landscape Units.

It can be seen throughout the presentation of Landscapes Units that each has specific strengths and weaknesses that indicate possible intervention guidelines for these areas. The quality of open spaces, mainly public, are the main components of qualifications or the requalification of the city Landscape Units. The strengths and weaknesses of the units show that different morphological, social and interaction of open spaces characteristics require different actions of urban and environmental planning.

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