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# An Approach to Landscape Planning in Borders

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## 1. Introduction

The so-called *urban-rural borders* represent a territorial phenomenon that presents itself as different kinds of landscape, according to the social dynamics of each settlement. Some of those are representative of their historical sprout or boom time, and others of their location. Urban-rural borders represent nowadays a very outstanding development in major cities particularly in developing countries.

This chapter randomly revises first, as a broad context, the very carefully treated and built borders of walled ancient towns, as representative of the self-centred urban attitude, where landscape is seen as an external reality distant from everyday interests. And second, the growth without borders or, better, without control, originating from the beginning of industry, that manifests itself as an invasive and underhand force that devours natural landscape by slowly ruminating and digesting it.

Following, as the core of the reflection, the fact that in the second half of the 20th century and beginning of the 21st when it becomes a centre of attention as the border could mean a crucial place to stop destruction of resources essential for life, is addressed. In the developing world the situation is not just severe because of its rapid rendering, expansion and consequent deterioration of landscape, but it is aggravated by social unbalance and complex socio-political situations.

Landscape studies in urban-rural fringe have not been abundant. Nevertheless, some representatives from very different corners of the planet can be quoted: Qviström and Saltzman (2003, 2006, 2007) from Sweden; Wang, Gu and Li (2207) from China; The Landscape Partnership Ltd. (2007) from the United Kingdom, and Pellegrino (2003) from Brazil. In Colombia some academics have talked about borders, mainly recently, but not precisely about "landscape in borders". For example: Toro, Velasco and Niño (2005), Velasco, Díaz, López (2010).

As a local application, an academic approach towards the solution to this threatening problem is shown, in a very special and intricate situation: the urban-rural border on steep slope. This is exemplified in the urban fringe of Medellín, settled in the Aburrá river valley. The topographical difficulty in this region is overlapped by a quite difficult social situation derived from rural forced displacement that makes the population, and consequently the settlement, grow not only from inside to outside but also by groups coming from distant places attracted by the urban imagery, but stopped at the periphery.

This is a very dynamic and complex landscape that deserves on the one hand a deep analysis and, on the other, creative solutions to cope with preservation of natural resources, satisfaction of social needs and development of cultural identity. A related research focused on the structural role of streams in the landscape of urban-rural borders on steep slopes has been carried out in the Landscape Design Master Programme at Universidad Pontificia Bolivariana."

The research team wondered: *How could we structure the landscape on borders?*

For the specific case of this research, the question was concretized as: How to value the structuring role of the water streams in the fringe landscape on the steep slopes of Medellín?

The purpose has been to produce a set of landscape guidelines to be presented to local authorities, with the aim that those be applied when planning, developing or reorganizing urban-rural borders in the conditions previously mentioned.

The method of the research consisted of disaggregation and aggregation. That is to say that the landscape universe was analysed from the diverse points of view that allowed a reasonable panorama of the situation. It meant to focus on the following landscape components: natural, social, morphologic, normative, and spatial/perceptual, for a clear and balanced approach. Although the research team is not properly interdisciplinary, each member took the responsibility of one component. The process was enriched with the advice of four landscape professionals, visiting lecturers from abroad, who came mainly to share their knowledge with the Master's students.

## 2. Borders in the past

As a broad time context following there is a selection of urban development milestones, commenting on them their particularities in relation to the landscape first represented as a menace from outside and later as an injured party of urban growth.

### 2.1 Walled towns

When ancient settlements, through the specialization of jobs, grew into villages and then into towns, different reasons drove their inhabitants to identify and separate themselves from the surrounding fields. As a physical consequence, a strong and conspicuous feature emerged in the landscape: the defensive wall. Undoubtedly this feature was seen, recognized and perceived by people who approached them or worked in agricultural fields outside the towns, but probably it was not interpreted as part of the landscape, because that concept did not exist in the vocabulary or imagination of older civilizations.

Of course, by the time that walled cities flourished, landscape was not a planner's worry, or even a simple purpose. The walls, promoted mainly by military and political causes, as well as every huge human construction, had a strong effect on people's perception of landscape, although this was an unconscious perception. Nature was "there", or outside the town, and life, property and safety were "here" inside the town.

*"Sumerian cities...from the III millennium B. C.... were surrounded by a wall and a moat that defended them and separated -for the first time- the natural open environment from the close city environment (L., 1977)"*



The wall signified another difference as well. The dominant people lived inside while the subjugated people lived and/or worked outside. That idea persisted worldwide, and still persists in many places, for a very long time up to the moment when “suburbia” started to mean economic power and high status outside. That is to say that there are at least two ways to inhabit the non-urban territory that surrounds the cities core: one not being able to reach their standards and the other passing those standards. Both ways are observed, in a strong contrast in many cities today.

In some cases, such as Arbela (or Erbil) in Mesopotamia (Figure 1), this division was totally defined by walls, while in Babylon and many other ancient cities the walls that conformed the border were combined with natural or managed watercourses. An outstanding and surprising case is that of Carcassonne, in France, surrounded by a double wall, with one quite close to the other. Some of the walled cities remained firmly throughout the centuries while some others underwent several changes and re-constructions. One such a case is that of the city of Athens, quite didactically expressed by Benévolo in his five volumes work *Design of cities* (1977).



Fig. 1. Arbela (or Erbil) a walled city inhabited continuously since its creation, B. C., up to date. Source Google earth 2011.

That practice of strong separation transcended for centuries, and even though the thinking that something appreciated should be enclosed flourished in managed landscape –or better garden- through the middle ages *orthos conclusus*, and later the green labyrinths, or portions of nature locked up to be enjoyed only by a few people, like an individual property.



Once the social and political circumstances that caused the growth of walled towns had changed and overcrowding became a problem, the surroundings had to be occupied. However, the feeling of being unprotected promoted in some cases the construction of a new peripheral wall that would symbolize security. This second wall, though, was not as fortified as the first.

By the time when walled cities reached their peak in Asia and Europe, in the land that later would be named America, a very different thinking guided its inhabitants relation to the earth. They used to define themselves, and still remnant tribes do, as part of nature. This thought is quite nicely expressed by the Uruguayan writer Eduardo Galeano, who states, even opposed to the Catholic believe of God's Ten Commandments, that God forgot the eleventh commandment: You will love and will respect nature to which you belong. (Galeano, 1994).

The conquering army's power defeated the natives' thought power and a result of that was the establishment of a walled city with the most extensive fortifications in South America: Cartagena de Indias, which is still the best example today. (Figure 2). Described as the masterpiece of Spanish military engineering in America and located on the Atlantic coast to the north of Colombia, the walled part of the city was declared by UNESCO as a Historic and Cultural World Humanity Heritage in 1984.



Fig. 2. A portion of the present urban area of Cartagena de Indias and, within the circle, the ancient walled city. Source: Google Earth 2012

Surrounded by water, although not rectified or geometrically transformed as had previously happened in other walled cities, in Cartagena de Indias the sea and the swamp offered the right environment to settle an urban core defended by bodies of water, which were reinforced by the infallible wall.

That inherited defensive attitude, that had repercussions on people's perception and interpretation of their relation to landscape, still remains in urbanism practice, particularly

within residential units or condominiums and may be seen everywhere in Colombia. This phenomenon results in a kind of landscape that wastes the wide richness of local landscape and hurts the local landscape identity.

## 2.2 Over passed borders

Over the centuries, the population growth led inhabitants to pass the second wall, when it existed, and to invade the nearest surroundings in a, at the beginning, moderate process, which was later accelerated by the effects of the industrial revolution.

Pablo Arias (2003), while revising urban history concludes that from the Roman city up to the eighteenth century, the formal and physical relationship of the city with its surroundings would remain relatively stable, with a closed city stated in the territory as the central fact and character, without altering the environment in which it was settled.

Traditional agricultural practices accelerated by new technologies, utensils and machinery depersonalized the previous relationship between towns and their territories. New tools formed part of the everyday landscape, and the result of their use, in many cases, homogenized the peripheral and rural landscape next to urban conglomerates.

Following the mentioned author, the difference between the ancient towns and the modern city, in terms of expansion, is the different behaviour in relation to its surroundings. The old historic towns reinforced their identity through the manner in which they were linked with the territory. Modern cities, on the other hand, exert the right to prey on the territory in searching of resources, some indispensable to live such as water and food, and some others necessary for social and economic development, such as roads and factories.

The confusion of this overwhelming texture of networks and frames depersonalized the old heritage sense of the city image in its territory; it is one of the most significant losses in the current city (Cano 1985)<sup>1</sup>

The city of Adelaide (Figure 3) represents an interesting example that illustrates a historical border that persists despite the later strong urban sprawl. Founded in 1836, the origins of this planned city have very little to do with walled towns, but the observed plan shape tells the story of a historical centre, a surrounding fringe and the later irregular sprawl. Adelaide was planned under *Light<sup>2</sup> Vision*, and the fringe –the Adelaide Parklands– that initially acted as the growth limit, contention and definition of the inside and the outside, now represents a great advantage. The needed green areas, usually desired when the population increases, were already there, bordering the old town. Although their general shape does not follow the Torrens river flow or other natural features that surely were there before the city construction, that green area represents an outstanding environmental and landscape resource that has a clear balancing effect.

Besides the environmental damage widely analysed under the concept of ecological footprint (Rees & Wackernagel 1994), the growth without borders or, better, without control, triggered by the conjunction of diverse forces that result in an invasive stain that spreads on the natural support to blot out all traces of what it was before.

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<sup>1</sup> Cited by Arias 2003

<sup>2</sup> Colonel William Light, planner of the city



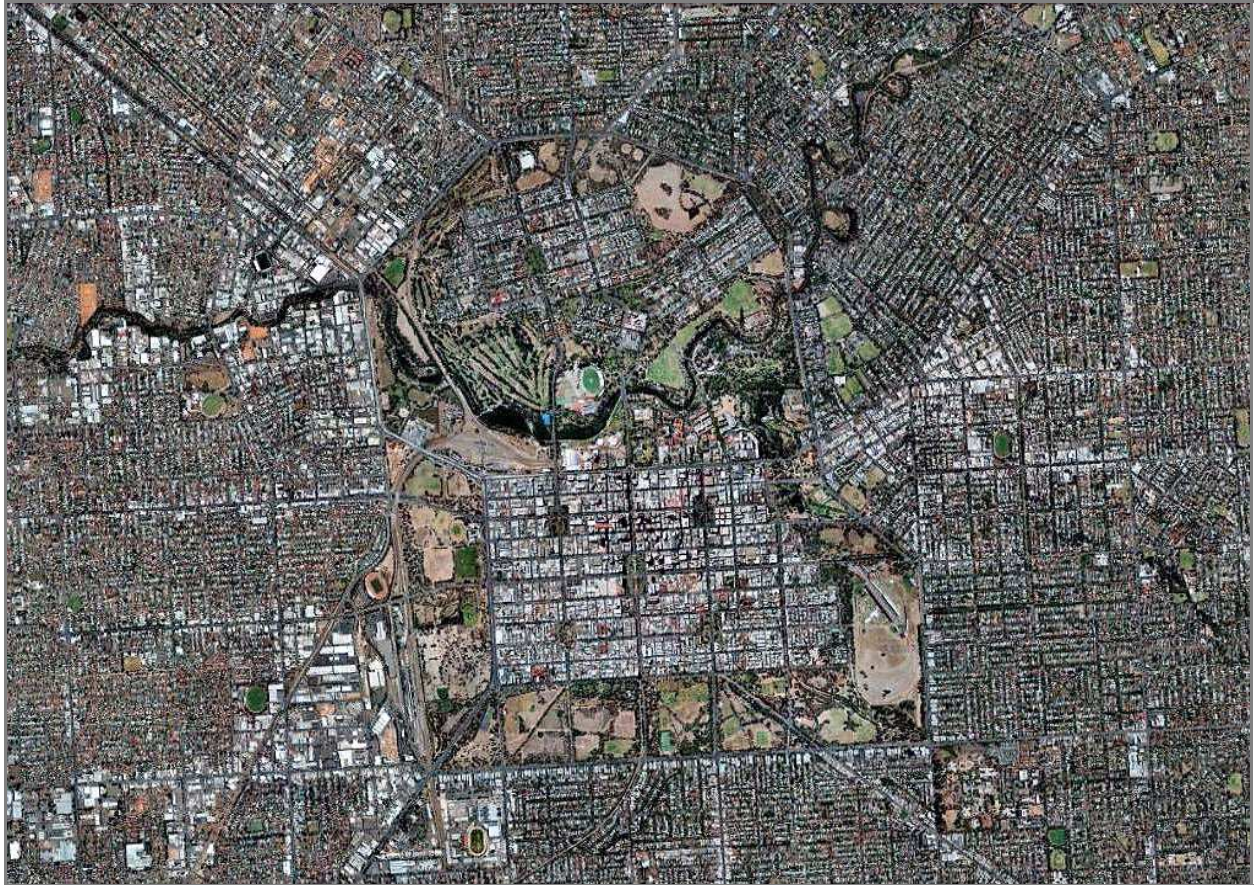


Fig. 3. Adelaide, South Australia. Source: Google Earth 2012

### 2.3 Demographic explosion effect

Facing the need of expansion due to economic growth, cities used to be thought of in a centrifuge manner. The borders moved faster than the planning authorities attempted to solve or even understand problems. The growth had been predictable or at least reachable by remedial strategies for centuries, but the demographic explosion of the 60's made an abrupt change on the previous inertia, mainly in the named "developing world". In this part of the earth, the situation has not just been severe because of the rapid urban rendering, expansion and consequent deterioration of places, but it has been aggravated by social unbalance, socio-political complex situations, and extreme environmental damage as well as consequent landscape disfigurement.

Facing the growth from this time onwards, planning authorities were at the beginning focused to solve issues from a single functional point of view, ordering and distributing land uses, as if the habitat were independent of inhabitants. That was the time of "zoning", a technical exercise that minimized the importance of the human behaviour of the diverse groups of population and communities and the significance of natural determinants of the territory.

The evident dysfunction of that planning system and the increasing social set of problems drove planners attention to society; that is to say, to the collective human factor. Aspects such as education, health, the right to work, social security, among others became even more

important than the assignation of uses to the land. In Colombia the beginnings of this kind of planning attitude could be placed in the 80's decade, to be followed in the 90's by the environmental worry.

Environmental issues have been much treated since the Stockholm Conference in 1972. But in the developing world it started to be important enough to be incorporated in local law two decades afterward. In general, the complex environmental problem seems to be increasing in a geometrical tendency, while the solutions increase in an arithmetical way.

Meanwhile, economical factors and land speculation go over the common sense of preserving resources and to treating them in a real sustainable manner. Words such as ecology, green, and sustainable, have lost their actual meaning and are used without measure. The "green wash" has invaded contemporary discourses hiding the real environmental question posed by the urban expansion.

To complete the spectrum, of zoning + social + environment, and rooted in its agglutinative and unifying role, many signals seem to point to this time being that when the integrator par excellence: THE LANDSCAPE occupies the deserved place as an important determinant in planning decision and purposes. As Sir Geoffrey Jellicoe thought *The world is moving into a phase when landscape design may will be recognized as the most comprehensive of the arts* (Jellicoe 1982).

To deal with the complex issue of indiscriminate urban expansion and moving peripheries a strategic coordination of many actors and factors is necessary. Of course the landscape design discipline is not enough but its contribution is indeed necessary first in helping to understand and balance the multiplicity of facets of the urban-rural border phenomena, and second to promote integrated answers to the complex trouble.

### **3. A research attempt to planning landscape in borders**

As mentioned before, research is being carried out at the Universidad Pontificia Bolivariana related to the landscape in borders in Medellín. The aim of this work is to contribute to the local authorities' acquaintance for better political decisions through the production of landscape guidelines applicable in any urban, civil, architectonic or infrastructural intervention that takes place on borders. This is in order to respect and understand the abundant, and by now abused, streams that run down the valley where the city is settled as a landscape structure on its borders. A very important circumstance comes with the city administrator team recently elected, one of whose major interests is focused on the urban rural borders.

#### **3.1 Background**

Historians have traced Medellín's act of foundation in four different dates in between 1575 and 1675, and also the site of foundation has been placed in different points. During the 18<sup>th</sup> century life in Medellín elapsed in a more rural than urban environment and even today this city shows a closer relationship with the rural environment and traditions than other Colombian towns.

The city was founded later than many other Colombian cities, for example those on the Caribbean coast or the capital city of Bogotá. Probably due to the location of the Aburrá valley in the middle of an intricate set of rough mountains of difficult access, formed by the Colombian Andes, in Antioquia province a region where the central and west branches of



the mountain system get closer, before of descending to the Atlantic Coast swampy savannas. Nevertheless, during the 19<sup>th</sup> century, Medellín underwent a population growth much higher than the rest of the country (Álvarez, 1996)<sup>3</sup>

While the British industrial revolution expanded to the rest of the First World between 1750 and 1850, South American territories were just being colonized. Industrialization arrived in 1930 in the form of Medellín's first factory, which as was the case in Manchester, was a textile factory.

The twentieth century brought an extreme increment of population to the city. Even before the demographic explosion the industry progress attracted workers from villages around that exerted a considerable population increase during the 40's. Since then the occupation process has been markedly informal and only from the second half of the 20<sup>th</sup> century, when the city had around 360.000 inhabitants, there were important planning efforts (EAFIT, 2010, pg. 50).

About natural resources and their landscape shape, EAFIT Department of Geology, cites Parsons (1997), who mentions a cut on the rock of the southern strait (of the valley), which deviates the river Medellín<sup>4</sup> to be able to explode the gold alluvium. And also mentions that communication between the diverse urban cores of Medellín was difficult because that they were separated by a wide muddy swath (EAFIT 2010 pg. 53). Nowadays, the river is completely channelized and the old muddy swath has been completely occupied. Many industries, administrative buildings and residential units are placed there, separated from the river by main roads that interrupt a sound relationship between people and the main natural landscape feature present in the city.

In the same source the following affirmation is founded: "The covering of the Santa Elena stream (the main affluent of the Aburrá river in urban area) started in 1926 and was completed in 1940 by the construction of the Nutibara square and Hotel. The rectification and the channelling of the river was started in 1912 and after several stage it finished with the construction of the Metro in 1985".

*La Violencia*<sup>5</sup> in Colombia began in 1948, having an effect on the main cities, but particularly on Medellín, due to the attractiveness represented by work opportunities in a booming industry. That violence would derive in a hard urban violence that has represented an immense obstacle to a sound development and to a healthy relationship to the landscape.

During the 70's the city suffered the very negative effects of mafia and drugs and it was sadly named as *the most violent city in the world*. Nevertheless, Medellín bears other titles that better account of the actual reality and landscape identity: *The mountain capital*, *The city of everlasting spring* or *The silver cup*. It is, as well, the only city in Colombia using the Metro

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<sup>3</sup> Cited by EAFIT 2010, pg. 51

<sup>4</sup> Two names are used for the river either Aburrá or Medellín. The first corresponds to a tribe of pre-Columbian inhabitants' name, and the second to the name that the Spaniard conquerors gave to the city in resemblance to a village in Spain.

<sup>5</sup> La Violence (1948-1958) Tensions between the two traditional parties, the Conservatives and the Liberals, led to a civil war. The violence, which left between 100 000 and 200 000 dead, ended with the establishment of the National Front (1958-1975), an agreement in which the conservative and the Liberals decided to share power even alternation in the presidency every four years, thus excluding all leftist movements (Rozema, 2007).

transport system, the first one to establish passengers' transport by cable and also a well-known touristic destination, positioned to host congresses and conventions.

### 3.2 Medellín borders on steep slope

Medellín is located in a basin with, proportionally quite little flat land, which of course was rapidly occupied. This relative topographical difficulty is compensated by a very friendly climate and humidity in between the range of human comfort through the whole year.

#### 3.2.1 Current situation

The topographical complexity is overlapped by a quite difficult social situation derived from rural forced displacement that makes the population and consequently the settlement grow not only from inside to outside but also by groups coming from distant places attracted by the urban imaginary, but stopped at the fringe. Medellín and nine more minor municipalities occupy the Aburrá river valley in a closed conurbation. This physical relationship is reinforced by the geographical identity of belonging to the same watershed (Figure 4) The steepness of the slope lets the permanent sight from one side to the other, from bottom to up, vice versa, and in general overpowering panoramic views (Figure 5).

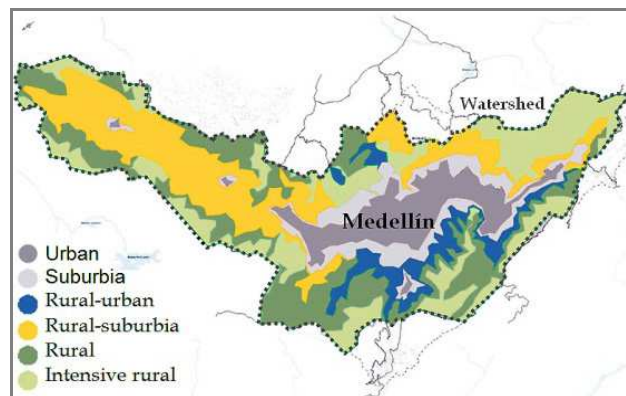


Fig. 4. Aburrá valley watershed



Fig. 5. Centre-east side of Medellín

Simultaneously, with a nice view to observe, those panoramas show the uncontrolled and worrying climbing of urban occupation on the hills (Figure 6). The picture changes day-by-



day and in contrast to the Adelaide case presented previously, there are not enough open areas reserved. This is worst because the numerous streams that run down are being buried and their adjacent watersides completely occupied and deteriorated. To aggravate the situation, this invasion happens not only by informal occupation (Figure 7) but also by planned housing developments by high-income neighbourhoods (Figure 8).

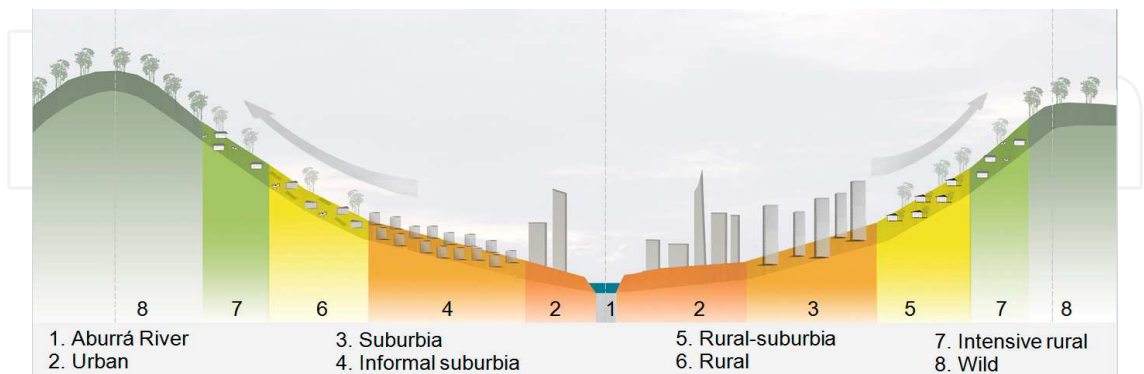


Fig. 6. A sketch section of the urbanized Aburrá river valley, the border moves upwards constantly and menaces with colonizing the edge



Fig. 7. Urban growth out of control



Fig. 8. High-income neighbourhoods

### 3.2.2 Solution attempts from the urbanism perspective

Local authorities have carried out laudable efforts that have propitiated a wide recognition of the recent development of Medellín throughout the world. There are two outstanding programs that exemplify those efforts: social urbanism and PUI.

Social urbanism is an innovative urban development strategy oriented to solve the conflicting circumstances that had driven the city to a critical situation. It consisted in to investing in grassroots communities in order to pay the "historical debt" that society owed to these urban links of the ignored city. It is not just intended to solve the underlying problems related to housing, employment and poverty. By building metro cables, parks, libraries, schools in high-quality architecture, public spaces, and other projects with a high aesthetic and social impact (Figure 9) it seeks not only to "make the best architecture, which raises pride and self-esteem of the community, an architecture that generates a sense of belonging", but also implement projects to "lead a profound social transformation." (Mayor of Medellín, 2008).



Fig. 9. España Library, Metrocable transport system, the bamboo bridge. Three of the many works recently developed as part of the program "social -urbanism", developed in the east side slope of Medellín.

Integral Urban Projects (known as PUI, in Spanish). "PUI is an urban intervention instrument that gathers physical, social and institutional matters, with the aim of solving specific problems on a defined territory. In this way, the City Hall, using all development tools in a planned and simultaneous manner, gets that actions oriented to development reach vulnerable zones" (Mayor of Medellín 2009).

According to local planning and development authorities the PUI components, in order, are:

- Community participation
- Coordination of diverse institutions plans and efforts



- Housing promotion
- Improvement of public space and mobility
- Alignment and construction of community facilities
- Environmental recovery

A prominent official plan on the topic is the Borders Master Plan carried out by the Urban Development Agency (known as EDU in Spanish). The plan represents a good institutional effort to develop an interdisciplinary exercise, focused on two particular sectors of borders, and that resulted in specific projects, already executed and of good reception from the community. It must be credited to this process the involvement, of a moderate contribution from the landscape discipline. This circumstance opens the door to professional landscape participation in projects leader by public institutions.

The advances in Medellín to improve the urban habitat in all senses deserve all admiration, but it has to be said that landscape has not been attended as much as it ought to have. Many times it is considered a superfluous activity that may be present or not, depending on the budget remaining and that could be solved by planting some trees. That is the landscape professionals' challenge.

### 3.3 Borders from the landscape perspective

Similar to many places in the world, Medellín has followed the planning process characterized by: functional emphasis, social emphasis, environment regards. The last, up to a level that could not be properly considered an emphasis jet.

Landscape is the core of the research, variable in itself, and in the case of the matter, that variation depends on other research variables like border, hillside and streams.

The "border" from institutional consideration, is usually seen as a line that the planner draws on a map, attending the use conditions more than the natural realities. As a line that, even in the recent past, some governors have pretended to identify by a particular colour (difficult or even impossible to materialize, but with a good reception from a naive point of view), to be seen from as many places as possible. A line almost without thickness that it is sometimes referred to as a "membrane"; a border as fragile as an administrative division that ignores or contradicts natural limits such as watersheds.

From the landscape point of view, this is to say, from a perspective that gathers natural dynamics, values and forms, signs of permanent occupation or in consolidation process, affective and appropriation relationships to the site, borders are not a line, and not even a fringe. It is an elongated space, composed by fragments or subspaces that aren't anything else but micro-basin portions occupied and deformed or mistreated. These portions are curiously placed in a perpendicular position to the basin axis: the streams. This is, in terms of the reinforcement and prevalence of this site as a settlement, beyond its natural calling and shape identity.

As an academic work and counting on the experience, even brief as it is, of the Master in Landscape Design programme, an approach from the landscape discipline corresponds. The landscape, as people perceive it, is the result of the interaction of natural and human factors with an eye on ecological, social, functional and economic values. That means, as it was mentioned before, an integrated interdisciplinary focus.

The nature of a site’s landscape is the result of many interactions; that is why the approximation to its complexity makes it necessary to split it up in parts that aren’t just elements or physical subdivisions, they’re systems or layers, in a cartographic language. With this premise, we proceed to identify the different parts that in this case are defined as components and subcomponents (Table 1). Such disintegration allows a precise analysis, a settled research and a well-balanced result of the weight assigned to each part, in the general definition of work. In this matter, once there’s a certain grade of clarity about the circumstances and the meaning of each analysis component, we proceed to confront ones with others and to identify its interferences. This constitutes the first step to a new and necessary aggregation. Gradually, after retrospective revisions, that aggregation was consolidated, as complex as certain limits allow it to be, to conclude with a work of an integral proposal.

The work, according to the expressed methodology, was organized selecting the following landscape components and subcomponents that in the context of this research were considered the most relevant:

LANDSCAPE COMPONENTS AND SUBCOMPONENTS	
Components	Subcomponents
• Natural	Relief (topography) Flora Fauna
• Hydrologic	
• Social	Actor Legal situation Use of space and resources Effects on space and resources
• Morphologic	Natural Urban
• Normative	Environment Water Biodiversity Landscape
• Spatial/perceptual	Panoramic Middle distance Experiential

Table 1. Disaggregation in components and subcomponents for landscape diagnosis.

It is necessary to point out that even when the hydrologic matter is part of the nature component, in attention to the streams importance in the work it was decided to develop the hydrologic component apart.

3.4 Landscape principles

To start, it is pertinent to select some concepts that express our interpretation of landscape and simultaneously support the landscape axis of the research. For such purpose, some substantial reference parts on the matter have been extracted, and are presented as follows.



The first reference is taken from La Gro’s Ten perceptions of landscape meaning (La Gro 2008, pg.157) and adapted to drive the basis for the intended guidelines (Table 2). The aim of replying to the author ideas was to establish a starting point that would compromise the research team attitude from the beginning.

SOME PRINCIPLES OF LANDSCAPE DESIGN		
Landscape as:*	Associated concepts:*	How we should reply**
Nature	Fundamental, Enduring	Profound responsibility and axis of design
Habitat	Adaptation , Resources	Creativity
Artifact	Platform, Utilitarian	Respect for nature respect, and social and common sense
System	Dvnamic, Equilibrium	Interdisciplinary strategies
Problem	Flaw, Challenge	Intelligence, sensibility
Wealth	Property, Opportunity	Social justice
Ideology	Values, Ideas	Re-discovering own roots
History	Chronology, Legacy	Tracing back past and heritage
Place	Locality, Experience	Facilitating perception
Aesthetic	Scenery, Beautv	Discovering, enhancing, enjoying

Table 2. Some principles of landscape design. \*Taken from La Gro James A. Jr. 2008.  
\*\*Proposed by the author of this chapter.

The second reference comes from Lucia Costa who says that landscape and city are destined to a permanent complicity relationship and supports herself on Lawrance Halprin (1981) when the landscape designer argue that the most interesting cities are those that allow to reveal that complicity (Costa 2006). These ideas encompass what we are daring to pursue through our work.

The third reference is taken from Anne W. Spirn who referring to her book The Granite Garden, says: after its publication in 1984, I was surprised how many people, including scientists and naturalists who refused to accept or ignored the evidence that human settlements, including cities, are part of the natural world. I have found that those ideas about nature and what is natural come from very deep feelings and beliefs. These views are personal and varied, and to change them is not simply a matter of some verbal arguments convincing, but to reach both the mind and the heart of people. Photography and landscape architecture are powerful ways to help people to feel, as well as reflect on the place of humans in nature. (Spirn, 2006). This reference drives our thought into the sensible and human side of landscape that could not be absent in a serious and complete landscape project.

From a more practical point of view it was agreed by the research team that the landscape of borders has to be seen at least in three scales:

- The panoramic scale that shows the fact and let appreciate it in terms of composition: line, texture, colour and form It is particularly evident in the situation of the valley always present wherever the observer is positioned (Figure 10).

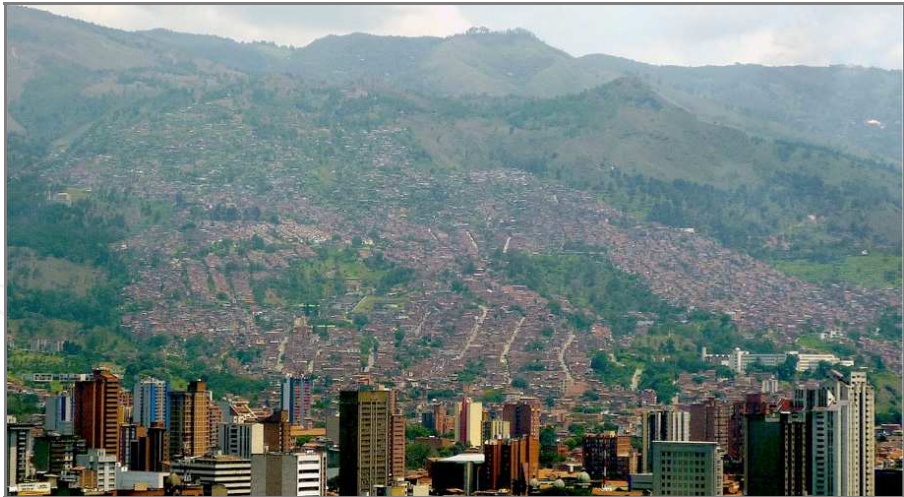


Fig. 10. Panoramic view on the west side of the Aburrá valley basin. Photo C D Montoya

- The middle distance scale where other aspects of landscape, in addition to the composition itself, emerge as the identification of local particularities. Here the rugged relief besides the unfeeling inclusion of buildings and civil works make landscape reading even more intricate (Figure 11) and 12).



Fig. 11. Middle distance view of a place where a stream is hidden.



Fig. 12. Civil works on a natural environment



- The experiential scale, in which the other senses, besides the sight, gain prominence in the perception of the place (Figures 13 and 14).



Fig. 13. Experiential landscape



Fig. 14. Extremely hard stream treatment

### 3.5 Research process

As a basis, support was founded in the PIOM (Integral Plans of Ordering and Management) applied by now to seven streams in the area of Medellín. Those were analysed in searching their landscape approaches, if any, but also because of the wide and up to date basic information that they could provide, avoiding invert efforts in a job already accomplished.

The AMVA (Environmental Authority of the Aburrá valley) has produced a PIOM Methodology to be followed in the case of every one of Medellín's streams. It is worth to annotate that landscape factor is absent of all considerations, as it is frequent in local public documents. In the scarce cases that landscape is mentioned it is addressed as the vegetation piece of urban design, or in any case as a secondary matter.

In their development, some PIOM make emphasis on one component while others do on others. In order to get a balanced approach, the established components were analysed on the same basis.

The hydrologic component was analysed under general concepts of water cycle and functioning, while the major and minor watersheds were revised in the territorial ordering

context<sup>6</sup>. Within Medellín’s jurisdiction<sup>7</sup>, more than 400 streams and 60 minor watersheds are reported; those conform 6 watersheds that tribute to the Aburrá river major watershed, a considerable water presence. In a closer analysis conflicts between streams, resource use, urban uses or mistreatment were studied.

After visiting several cases, observe, perceive experimenting and talking to local people, the analysis from each component was captured on a template designed to gather in an organized way the contributions from each sub-component to the landscape diagnosis. One of the records obtained from the spatial/perceptual landscape analysis is shown ahead as an example, selected because in some way it gathers other topics and because this specific topic could be more relevant in the context of this book. (Figure 15)

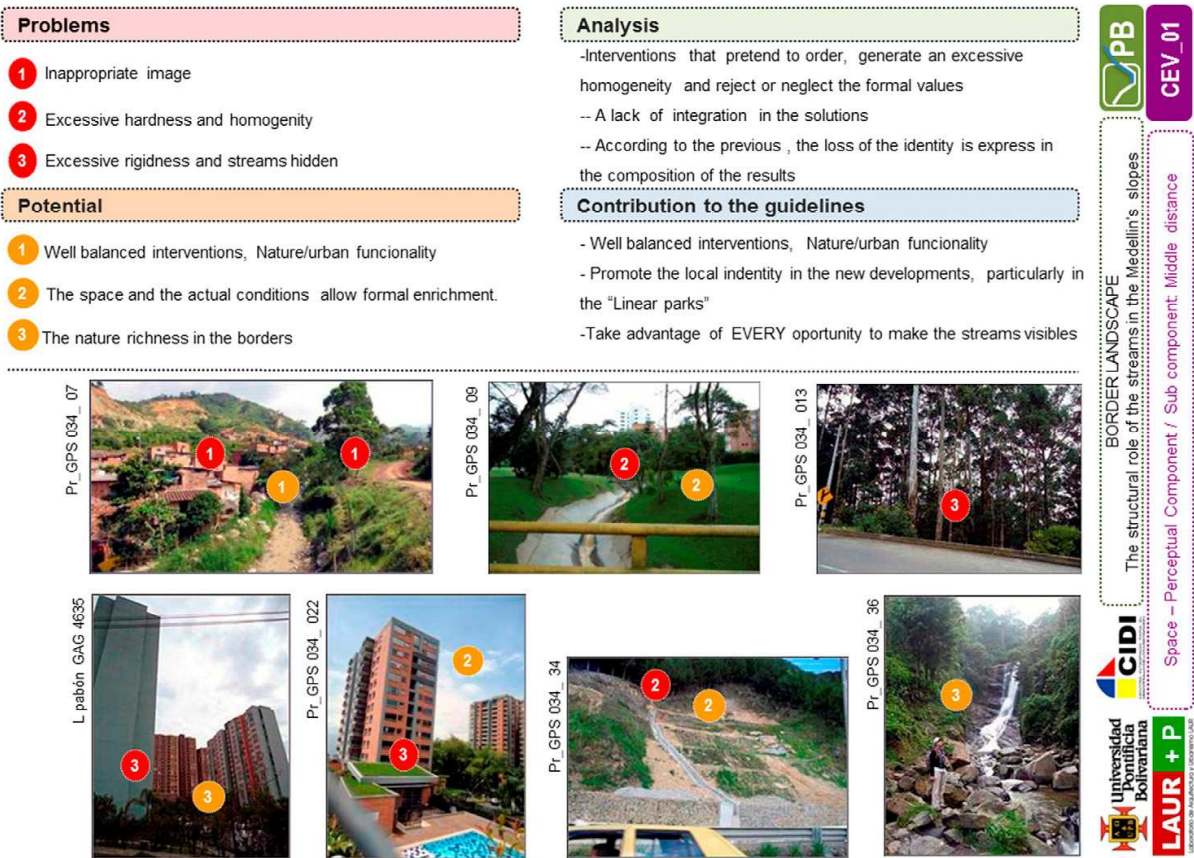


Fig. 15. Example of landscape analysis template, to be applied to each landscape component

To be able to identify the streams in the panoramic scale would contribute to recognize those landscape features, and would help to local and visitors to orientate themselves by the reading of the territory. It is particularly evident in the situation of the valley always present wherever the observer is positioned and because the skyline, a significant visual resource, sometimes is menaced by the urban expansion. That identification also would help local inhabitants to get familiar with the streams, as well as other landscape features, and even though to be proud of them.

<sup>6</sup> Colombian Law 2002, Decree 1729  
<sup>7</sup> An extension of 380 Kms.2

In Figure 11, where middle distance scale is illustrated it is difficult to guess that a stream exists, because the scene is all starring by the buildings, road and bridge. An appropriated forestation of the waterside, completely missing, would help to identification and orientation of users and also to a harmonious equilibrium of the scene. The case illustrated in Figure 12 shows how sometimes public works go ahead of urban occupation against a beneficial use of natural features in the landscape.

In the experiential scale (examples shown in Figures 13 and 14) landscape is perceived as more dynamic than the other two scales mentioned, because of the detail that could be experienced and because that the atmospheric phenomena could be felt more strongly. Hearing, smell and touch become more noticeable and discomfort could become exacerbated.

### 3.6 Results

Research is still on the process but partial results have been obtained as preliminary guidelines, taking as reference the Manual of Environmental Guidelines for the design of Infrastructural Projects in Bogotá D.C.<sup>8</sup>.

The first result has been the construction of general criteria to facilitate the applicability of landscape concepts and assessment on the identified reality. These criteria intend to cover, in balance, the broad conceptual basis of landscape: natural, human perception, social function, and environment. As it may be identified in the following list, criteria from 1 to 3 correspond to natural basis, from 4 to 6 correspond to human perception, from 7 to 9 correspond to social function and the last one to environment.

1. Hydrological functionality
2. Promotion of biota
3. Contribution to environmental conditions
4. Valuation of riparian landscape on hillside
5. Conscience of the historic present
6. Responsible appropriation of streams in hillside
7. Minimization of the risk
8. Recreational benefit
9. Educational benefit
10. Environmental sustainability

The second result is a set of guidelines for intervention in the landscape, feasible to be adopted in local politics and regulations that foster the streams as landscape structuring entities. Each one of the three tables produced addresses a feature of those present in the streams: one on the course, another on the waterside, and the last one on intersections with roads or other infrastructure items. Only the second one is presented ahead (Table 3).

The guidelines have been organized according to progressive stages of a project: planning, design and intervention. The first stage is addressed principally to public decision makers, the second to designers and the third to constructors. Crossing the mentioned criteria with these stages, a matrix was obtained to register, as guidelines, the ideas discussed and agreed

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<sup>8</sup> Developed in 2003 and revised in 2006 by the author of this chapter, for Bogotá local planning and environmental authorities



LANDSCAPE GUIDELINES FOR STREAMS IN URBAN-RURAL EDGES			
WATER SIDE			
CRITERIA	PLANNING	DESIGN	INTERVENTION
1. Hydrological functionality	<ul style="list-style-type: none"><li>• To respect and increase catchment surfaces</li><li>• To identify and protect associated water flows</li></ul>	<ul style="list-style-type: none"><li>• To guarantee appropriate permeability and drainage</li><li>• To make the water visible to generate appropriation and responsibility to it.</li></ul>	<ul style="list-style-type: none"><li>• To guarantee the natural flow of the run off</li><li>• To facilitate the relation vegetation / water</li></ul>
2. Promotion of biota	<ul style="list-style-type: none"><li>• To enhance the streams by means of water side management To constitute the water sides in green corridors as bird habitats</li><li>• To provide identity by sectors, through design diversity</li></ul>	<ul style="list-style-type: none"><li>• To take advantage of the biodiversity and enrich it in a sustainable way</li><li>• To recover degraded areas.</li><li>• To give continuity to existing environments.</li></ul>	<ul style="list-style-type: none"><li>• To establish diversity of vegetation associations attractive for birds.</li><li>• To attend multilayer and natural succession</li><li>• To restore the aquatic ecosystems</li></ul>
3. Contribution to environmental conditions	<ul style="list-style-type: none"><li>• To respect the character of every border area.</li><li>• To design and carry out every border with similar quality</li><li>• To recover ecosystems and balance opportunities in the city</li></ul>	<ul style="list-style-type: none"><li>• To improve watersides to generate environmental richness</li><li>• To promote them as transition or ecotones between different uses.</li><li>• To respect the existent natural functioning</li></ul>	<ul style="list-style-type: none"><li>• To apply phytoremediation techniques</li><li>• To improve degraded areas through appropriated vegetation</li></ul>
4. Valuation of riparian landscape on hillside	<ul style="list-style-type: none"><li>• To enhance water sides as attractive and relaxing spaces, climatic stabilizers and landscape articulators.</li></ul>	<ul style="list-style-type: none"><li>• To reinforce site or corridor identity</li><li>• To condition the design to natural landscape and follow its image, without imposing capricious geometry</li></ul>	<ul style="list-style-type: none"><li>• To take advantage of relief, rocks (if there are some) and vegetation formal qualities</li><li>• To avoid interruption on user and water relation relationship</li></ul>
5. Conscience of the historic present	<ul style="list-style-type: none"><li>• To contextualize planning of these areas into landscape premises, instead of the application of foreign urbanism patterns</li></ul>	<ul style="list-style-type: none"><li>• To recover local cultural and natural values and features.</li></ul>	<ul style="list-style-type: none"><li>• To value and reintroduce artisanal principles and techniques</li></ul>
6. Responsible appropriation of streams in hillside	<ul style="list-style-type: none"><li>• To favor understanding of hydrological functionality by the community</li><li>• To coordinate positive rapprochement from inhabitants to streams</li><li>• To involve them in assignments that lead to the stream enjoyment</li></ul>	<ul style="list-style-type: none"><li>• To keep 80% of the area in soft surface to make drainage easier</li><li>• To take creative advantage of area natural morphology</li><li>• To provide generous spaces for permanence and slow walks.</li></ul>	<ul style="list-style-type: none"><li>• To involve local residents in the construction works.</li><li>• To use signposting to inform and welcome visitors</li></ul>
7. Minimization of the risk	<ul style="list-style-type: none"><li>• To constitute the water sides in shock-absorbing of environmental risk</li><li>• To avoid assignment of uses in risky places</li></ul>	<ul style="list-style-type: none"><li>• To design respecting morphology and natural functionality of the area</li><li>• To harmonize risk mitigation strategies with previous landscape</li><li>• To define spaces and use vegetation allowing visibility of critical points</li></ul>	<ul style="list-style-type: none"><li>• To mitigate risks with natural structures</li><li>• To allocate signposts and marks for a correct orientation</li></ul>
8. Recreational benefit	<ul style="list-style-type: none"><li>• To constitute water sides in routes and stay spaces of visual recreation.</li><li>• To improve recreational offer for free time enjoyment</li></ul>	<ul style="list-style-type: none"><li>• To compose subspaces and transitions harmonically.</li><li>• To avoid drastic divisions</li><li>• To facilitate the development of group activities</li></ul>	<ul style="list-style-type: none"><li>• To establish vegetation attending their functional and esthetical qualities</li><li>• To make good use of local vegetation qualities to provide comfort</li></ul>
9. Educational benefit	<ul style="list-style-type: none"><li>• To study the behavior and wealthy appropriation of water sides in diverse social groups</li><li>• To empower educational institutions to use and care for water sides.</li></ul>	<ul style="list-style-type: none"><li>• To facilitate the rapprochement and knowledge of natural richness</li><li>• To provide spaces for informal education and observation</li></ul>	<ul style="list-style-type: none"><li>• To preserve, compensate and label the existing vegetation</li><li>• To allow participation of the community in construction works</li></ul>
10. Environmental sustainability	<ul style="list-style-type: none"><li>• To respect the environmental offer at the intervention and improve its role as part of the ecological net and air cleaners</li><li>• To avoid the uses that may stimulate pollution</li></ul>	<ul style="list-style-type: none"><li>• To take advantage of underestimated spaces</li><li>• To guarantee the clean air necessary to breath while exercising</li><li>• To propitiate shock-absorbing of noise in favor of fauna</li><li>• To guarantee a healthy environment to sane users development</li></ul>	<ul style="list-style-type: none"><li>• To value and take advantage of marginal spaces</li><li>• To take advantage of functional and formal qualities of vegetation</li><li>• To propitiate self-sufficient maintenance and management of bio-mass wastes</li></ul>

Table 3. Example of the guidelines matrix set, applied to the streams waterside.

by the research team, each one of the members' standard-bearer of her or his component of responsibility.

In synthesis, summarizing the three described tables there are around 200 ideas that could be taken into account when facing a project in borders, near a stream, for a better landscape in projects responsible and respectful of natural resources, people's feelings, society needs, and environmental consciousness.

#### 4. Conclusions

Borders have been always a special issue for settled communities. The landscape of borders on steep slopes is a very dynamic and complex fact that deserves, on one side a deep analysis and, on other, creative solutions to cope with preservation of natural resources, satisfaction of social needs and development of cultural identity.

Certain Rogers' statements have been confirmed: Cities have become pests in the landscape, vast bodies that absorb energy from the planet for their maintenance: relentless consumers, relentless pollutants. (Rogers, 2000, pg. 27). Although many efforts have been carried out, the evidence shows that those are not enough to counteract the environmental damage. A healthy environment is the basis of a sound landscape so the two issues have to be attended together for both body and spirit heal.

There will be no sustainable cities up to the moment that urban ecology, economics, sociology be integrated into urban planning (Rogers, 2000, pg. 32). To complete this comprehensive statement it is also necessary to apply and benefit from the integrative function of the landscape approach and its perceptual issues, to accomplish, not just well constructed or equipped, but enjoyable cities that reach both mind and hearth of people.<sup>9</sup>

An intense responsible work has to be undertaken, at least in the developing world, to situate landscape matters in the authorities and managers' minds and hearts. This is part of the academy responsibility to develop a strategic way to evidence the significant importance of landscape matters and put them closer to public decision makers to position them on par with infrastructure, housing, mobility or industry in search of better cities for happier people.

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<sup>9</sup> According to Spirn quotation in page 14 of this chapter

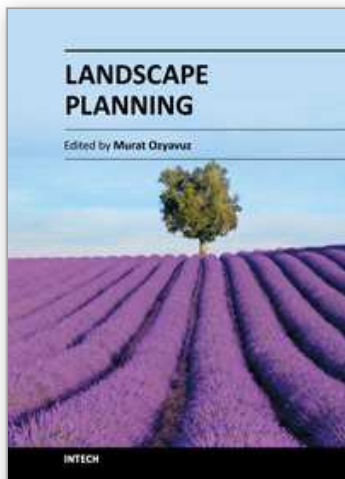
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