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Author: Rinë Zogiani

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An Approach On The Formal Sustainability Of The City And The Definition Of Sustainable Elements On City And Urban Scale. The Case Study Of The City Of Tirana

RINË ZOGIANI

Faculty of Architecture, University of Prishtina, Bregu i Diellit p.n, Prishtina, Kosovo

Abstract

The context in architecture has always been a special place of discussion. Many architects and philosophers who dealt with cities and urban planning always tried to find ideal solutions for the community, for the city, and beyond. As a result of continuous studies, thoughts, and numerous analyses, there are many definitions, questions, and conclusions about the ideal city and inevitably in each conclusion or result from the identity of the country came naturally as a component.

The objective of this project is to develop a methodology or set of methods for measuring and evaluating the sustainability of the urban form. The outcome of the project will be instruments of analysis and architectural/urban composition expressed through drawing. The concept will be compositions that indicate the sustainability of an existing site and propose a future sustainable form. The objective of this collaborative research project will orient in solutions to sustainable elements by itself and at the scale of the city of urban by differentiating sustainable and unsustainable elements.

The idea of belonging and place are parameters that will always be stable and that people naturally look for, therefore, here the local identity, stability, belonging, memory, and connection with the place where we live and work come to the fore. This raises the question of what makes a place sustainable in terms of form, architecture, and belonging. What are those elements that contribute directly and indirectly to the formation of the country? (T. Jashari Kajtazi and R. Zogiani, 2021) From the case study, during two workshops in the framework of doctoral studies and scientific research on this topic, analyses were made in Polis and Ferrara with groups of students of different profiles to determine the elements and those indicators that have given a result of gender and the construction of cities- theoretically and practically. As Rossi claims in Architecture of the city (Rossi, 1984)- critiques modern architectural practice for its lack of awareness of the city in this book. Rossi contends that a city must be examined and cherished as something built through time, with special emphasis on urban artifacts that outlast the passage of time – that seems to be correct in some aspects of the city. On the other hand, (Sitte, 1945) examined successful public spaces in ancient towns in terms of patterns and relationships between town features, as well as the sequence and complexity of plazas and roadways – so by analysing the city of Tirana practically will be seen the elements relevant to each theory and claims fit in or not.

From these two organized workshops, systematic and professional work was done in the fields of architecture, urban planning, and the environment so that the research was as real and comprehensive as possible. Tirana was the city that was studied by us and the outcomes were derived from analysing Tirana, so that they serve for other approaches with same complexities and difficulties for other cities with similar issues.

Keywords

Sustainability of form, sustainable cities, Tirana case study, urban form

Introduction

During the analysis of the maps in the time line from 1921-1937-1985-2005-2020 there are changes, overcomes of the city of Tirana. The boulevard represents the dividing and coupling axis in terms of areas to be analyzed. In the part which our group analyzes from Skanderbeg Square to the so-called New Tirana and continues in the south, in early 1921 was the suburbs of the city or sub-urb. Also, the tracks of the Lana River imply that neither the river nor the surrounding spaces were yet treated. It was mainly peripheral residence with the accompanying parts such as religious facilities and families farms and administrative facilities in small numbers. As an urban pater it is noted that it was empty therefore, uninterrupted compared to the upper part of the axis we are talking about. The circular/ distinctive elements for this area were the Lana River, the hills at the Lake and the villas (groups of villas built in the area). To approach into urban analyses and investigate how conventional perceptions of urban space have been lost in modern cities (Krier, 1979) investigated whether, and on what grounds, the idea of urban space holds any value in current town planning by describing the concepts of urban space and its structure – especially the timeline of city of Tirana development and its reasons.

In the footsteps of the map of 1937 there is a difference regarding the regulation of the riverbed and the predisposition prepared to build/ handle empty spaces in this area. The two sides of the axis were built as public spaces- the left side with recreational sports fields and the right side of the royal blacksmith and the existing sleep continued to be the American Embassy- on the right side.

Until the 1985 map it is noted that the upper part is shaped along roads and dreams of a certain importance to residents (more or less Donkey's Way - Le Corbusier) and the bottom is distinguished by square and mainly social/complementary buildings missing in The upper part such as: Pyramid, Park Rinia, New Ministers, Theater, the Queen's Park at the Palace of Pioneers, Assembly, Prime Minister, Palace of Congresses, Academy of Arts, Rectorate, Corps, Polytechnic University and Tirana, have been re-conceptualized. Qemal Stafa Stadium.

At first glance it is noted that the bottom was "filled" with missing or needed buildings over the years that supported the population growth - as social, cultural, sports, administrative facilities. After the construction of these buildings the spaces that remain again without construction were filled with buildings for the various functions needed over time, such as residential buildings, shopping mallsetc.

Sustainability increases from the transition to the "Donkeys Way" system and below the "Man's Way" (Corbusier, 1987). This is because it is not experienced violently or dramatically/dreaming of the extreme person to another.

Cardo and Decumanus, therefore the main grid or cutting two main roads imposes the durability of the geometric rule shape and imposes the separation of blocks in this mere. We result in the sustainability in the buffer the area that divides and at the same time connects these two parts of Lana River. Then to the greater degree the same is repeated with the shape of the building and its placement in full and this is a disposition for sustainability or non -sustainability. Given a Big Picture axes determine urban plaques, then they are predisposed to take the form of these axes or buffer elements (separating or merging) and to the staircase still setting the object in full determines the sustainability or without it. Benevolo emphasizes the unifying philosophy that drove all achievements of thinking and action—even the simply technical—and proves their correlation in spirit up to the period of the Renaissance (Benevolo, 1971). So, in the analyzes that have been done it results that the object located in a given position has subsequently determined the stratification of the objects, the addition, the closure of the block or even the collapse—as a generalization.

From analyzes it is observed that when the objects are adjacent or in the range there is a greater enlightenment than when they are free from the four sides have predisposes to accept root, attachment or increase. In some cases, these combinations have been adapted to stratification and have achieved a form consistency in other cases has resulted in the opposite. These may mainly have no sustainability in placement by not following the form.

Materials and methods

Considering the analyzes done in the first part of the workshop and the results of these analyzes we have come to some conclusions that have proved sustainable in time and in the space we talk about, the southern part of the city of Tirana. From city readings through various methods, first mapping, incorporating the existing state, diagrams and schemes, the dismissal of other fragments from the part that has been analyzed, the chronology of city development, actresses and other factors emerged that influenced that kind of development and growth of the city and other elements emerged that in one form or another determined the development of the city.

In the observation that the city grew over the years and that construction was made in certain ways starting from the filling of the blank initially that it is easily observed in the comparison of the 1921 map with the 1937 map and the distribution of follow -up functions in the years to continue from 1937 to 1985. (Figure 1,2,3) The main division and coupling determinants were the Boulevard at first and then the Lana River along with the landscape and natural element of the Dajti Mountains that served as a natural boundary until the construction had not yet reached. The southern area developed differently from the northern area. While the northern area was developed along the roads and in irregular geometric shapes while indications of the development of the southern area were other and the area was divided into two parts as a result of the boulevard and these parts were divided into regular geometric shapes. While the northern area can be characterized by Le Corbusier's terrain for the development of the so -called 'Donkeys Way' (Corbusier, 1987) part of Figure 4. Study areas A, B, C, D along with overcrowding over the years.

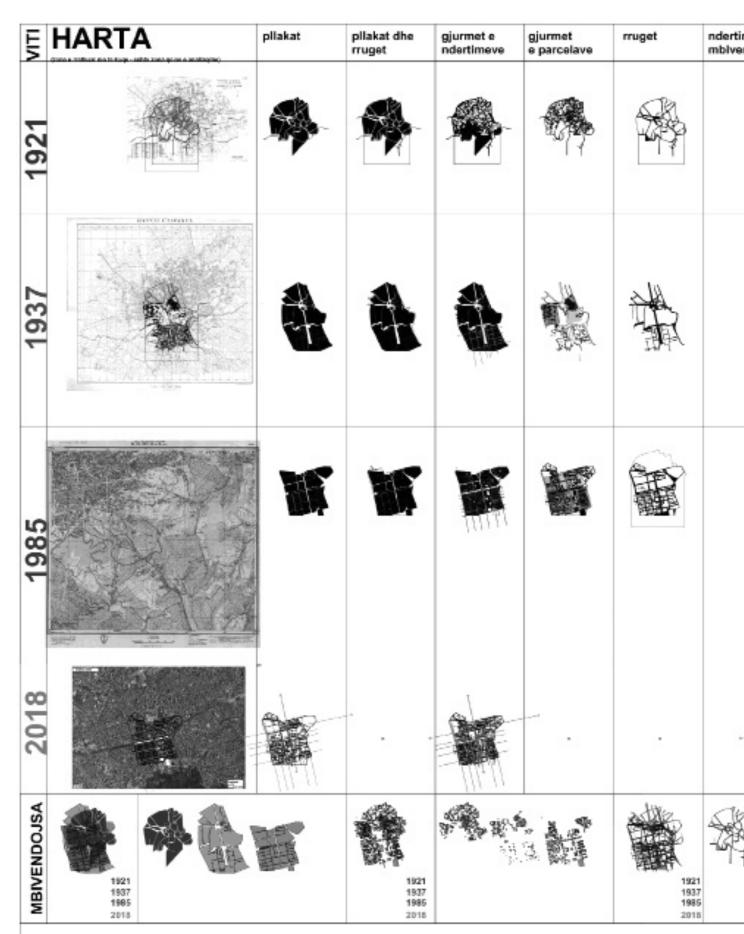
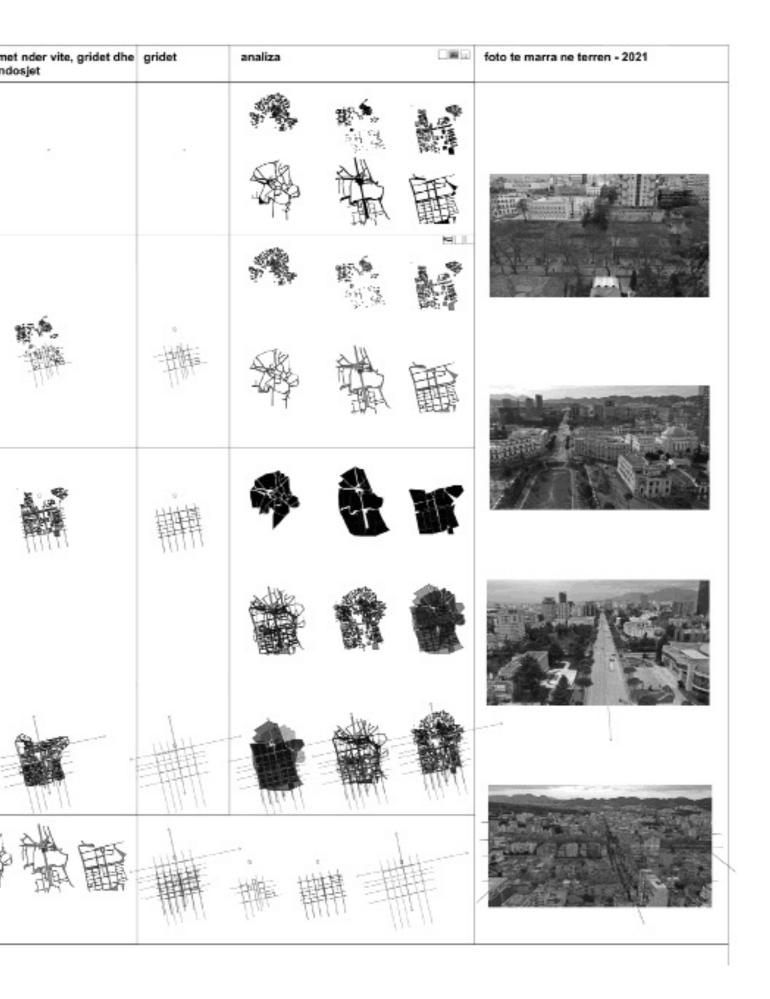


Figure 1. The analysis began on a time axis by reading maps from 1921, 1937, 1985, 2018 to 2021.



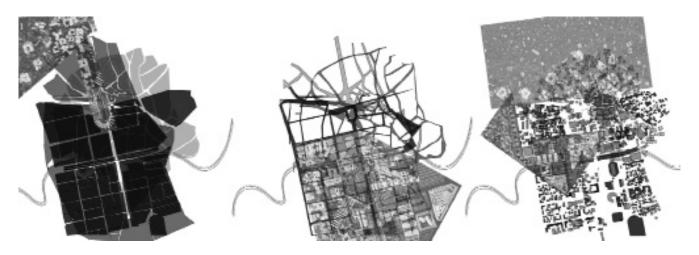


Figure 2. Basins through 1921-2021 Diagram/ Artistically expressed

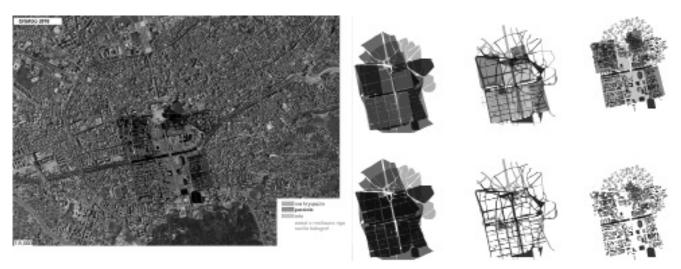


Figure 3. Overlaps in the years 1921-2021 and separation Zone. Removing the study areas, marked with yellow.

The southern area was developed according to the opposite of it in 'Man's Way'. In the area developed according to Donkeys Way according to, Corbusier thus developed some of the largest cities that passed from the outskirts, the provincial neighborhood in the city to the metropolis such as Paris, Rome or Istanbul. Here, in fact, it is noted that the most stable form turned out to be a triangular shape or trapezius -shaped block which had some special features. In 'Man's Way' we also encounter in the southern area of the city the rectangular forms and the networks that have been presented have resulted as the most sustainable forms that were developed without much overlap, changes and the mixture of functions turned out to be one of the key factors after networking, block rectangular shape and tracking forms of construction according to the block. To illustrate the findings in the precedent 4 different blocks in the form, function and location in both parts of the city, from the High Lana and from Lana down, so -called northern areas and southern areas. We have also studied the same areas and read overlaps for years and in Figure 4 can be seen with: A, B, C, and D. From here we generated small blocks units that proved stable or unstable and the reasons and findings of why these areas had resulted



Figure 4. Study Areas A, B, C, D together with overcrowding over the years.

in. These can be observed in the following diagrams. Some of the elements that proved to be unstoppable were the open angle between blocks and buildings (which was also observed while visiting the field and observation, photography and contemporary), as well as setting up construction at the edge of the block without any distance caused to have caused certain problems and the stimulation of some spaces, and the buildings fragmented in a string let's say. Here they had resolved to be built between them and in all unclosed spaces, inexpensive in-

formal housing or other similar informal constructions and had made the block or united unit in terms of form and had created other urban problems, widespread social throughout the city. Through the diagram we illustrated and identified these resistant and non -diligent elements and their reasons and identified our areas alongside these elements when it turned out that the areas (a, b, d) were central and zone C proved sustainable. For these reasons, many construction overlaps were overlapped and problems were created by the most architectural, urban, environmental, and resulted as an unstable area. (Figure 5)

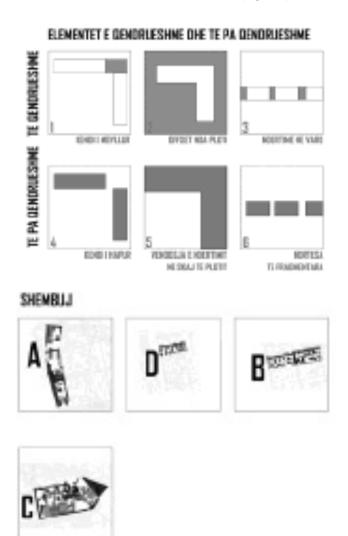


Figure 5. Diagrams of shape stability analyzes next to study areas A, B, C, D.

From here we continued and analyzed by means of the diagram method also the sustainable forms, taking into consideration the environmental elements, the configuration of the terrain, the shape of the plots, in short, all the architectural and environmental elements taken into consideration to find the so-called 'morpheme' urban through which we will give a finding of what has turned out to be sustainable by profiling the factors in question. By means of the diagram, these parameters have been identified and laid out as such to analyze further along with the formal stability of the block found on the ground. (Figure 6) From these analyzes as a conclusion we derive two sustainable forms within the urban block. So, taking into consideration the

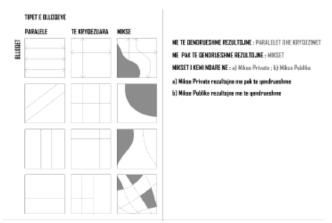


Figure 6. Analysis diagrams of blocks, roads, terrain configuration and functions of built blocks.

form of the block, the network of blocks with roads and the morphology of the terrain, the following forms support and contribute the most to the stability of the form, including the friendly or mixed functions.

Closing the block and corners, variable height and allowing air circulation. These parameters resulted from the architectural, urban and environmental analysis of the area and this for the



Figure 7. Analysis diagrams of blocks, roads, terrain configuration and functions of proposed blocks

reason of the sustainability of the form, the avoidance of informal housing and informal spaces that cause various problems in the city, the more efficient control and maintenance of spaces within closed or corner blocks closed, avoiding spaces with predispositions for possible urban vandalism, offering the possibility of solarization and ventilation as efficiently as possible by changing the storeys, enriching them with different functions so that these areas are not active or passive in a certain part of the day as well as the analysis of the environmental condition of the morphology of the terrain and the blowing of the winds (that is, the rose of the winds), elements with which the location of the building in the block is determined and the ventilation, the cleaning of the air from various pollutions is possible, the opportunity is offered to plant greenery that is essential for the quality of life, and are they facilitated or not natural processes characteristic of the country are hindered.

From the above findings and proposals, we come to a conclusion or an urban morpheme based on the above analysis through the reading of the city and the diagrams that the essence of the sustainability of the form or the so-called urban morpheme is made up of these elements: The shape of the plot/ block and surroundings + mixed built typology + terrain with other characteristics of the country. The morpheme illustrated with diagrams can be seen in Figure 8.

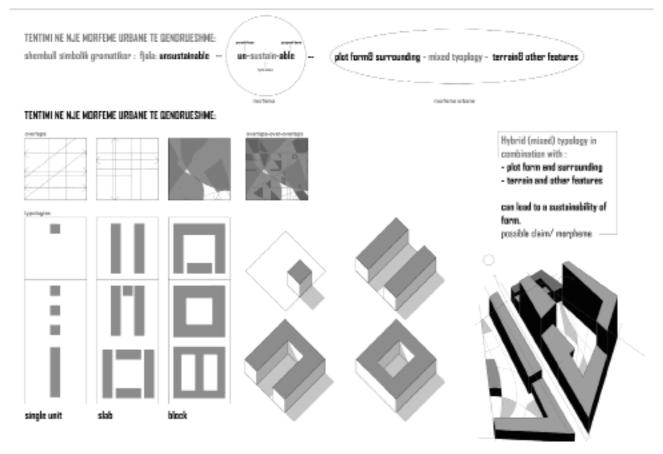


Figure 8. Morpheme illustrated in diagrams.

Therefore, living structure is dependent on traits that have a close relationship with the human self, and that living structure has the potential to foster human well-being. (Alexander, 2003-2004)

From the findings of the first part of the workshop, it has been found that the most sustainable form is that of orientation and following the natural features of the terrain, morphology and other characteristics of the context. (Figure 9)

From here we have extracted the directions from the overlays of the maps during the reading of the city and analyzed them by overlaying these grids, which have generated the most stable forms. From this part, the idea was to speculate in the northern part of the city and take the years 1975-1985 to see how the city could have developed and how the findings would possibly be implemented in a new situation, to achieve stability of form.

The same procedure in principle has been applied in this part, where it first started with the analysis and reading of the city in this period to see the agents that were indicators in the development of the city and the predispositions. Mumford (Mumford, 1938) studies the evolution of cities from medieval times to the early twentieth century in The Culture of Cities to demonstrate the patterns and forces that generated the contemporary "megalopolis" and its faults. So, this analogy, the maps and drawings also show a similar or mirrored configuration of the terrain and environmental characteristics as in the lower part of the city that was analyzed earlier. Here again is the river as a natural element that separates and unites two different parts of the city, we have the mountain configuration that limits and sets a kind of

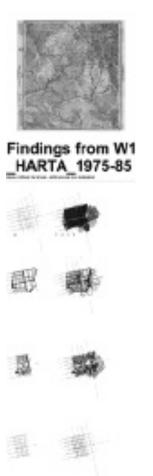


Figure 9. Networks and their overlaps to find the most stable form of the whole and then the block



Figure 10. Map of the northern part of the city of Tirana in the years 1975-85. The yellow marked area is the study area.

border of the city, as well as the boulevard, which is unfinished and that penetrates and predisposes developers or coming to it. which the city will develop. The railway is on the same line and it is noticed that there are few buildings, mainly there are industrial buildings of the time, so, a suburb at that time was conceived as the end of the city, charged with complementary functions necessary for the development of the city, while the rest it was accommodated with residential and social functions.



Figure 11: E. Howard - Garden cities (https://www.gutenberg.org/files/46134/46134-h/46134-h.htm)

The cities of the garden the next day begin describing "Three Magnets": City, Country and City. The Howard makes it to why we are drawn to the best aspects of both the city and the country. The cities of the garden in their heart and their own have a central garden, with housing rings, shops, roads, industries, fields and farms. The commissioned presentation aims to improve biological, social, economic and personal life for every-

one. Ebenezer Howard thought that the cities of the garden would work because the plans were based on understanding human nature.

-RedBurn- New Yersy

Situated in the town of Fair Lawn, New Jersey was a small community of 3,000 people named Radburn. Despite its small size, Radburn stands between individual groups, commercial belts and unplanned growth of fairlawn. I plan the 1920s fund, Radburn was thought to be a self-contained community of 25-50,000 with unique green spaces, transport systems and secret neighborhoods. It was supposed to represent a solution to the problem of drinking. Of the 77 visits sites, the City Housing Corporation (CHC) chose to develop Radburn in Fairlawn, New Jersey for different arseye: land costs in fairlawn were ultrated because it was a tender in fairlawn were to have innovative planning spaces On the site, and the fairlawn was only 16 miles from New York City. The ERIE railway line can take the road to the center of New York Citizen for 45 minutes. Also, he traveled to New York City by car was facilitated with the end of Uras George Washington in 1931.



Figure 12. RedBarn- New Yersy(https://www.greenbeltonline.org/rad-burn-nj-garden-city-model-greenbelt/)

Radburn was conceived as a balanced city. Make it contains one intertwining of industry, open space, trained and residential areas. In Radburn, the Irishtur neighborhood community the topic of city construction. The neighborhood consists of markets, schools, superblock, road traffic system and open space. The shape of the super block was related to the earth and the friendly of life. Super blocks are 35-40 hectares surrounded by wide roads and depressed with suburban alleys.

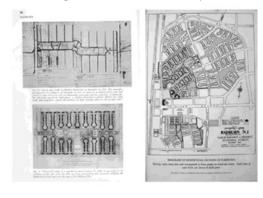


Figure 13. RedBurn- NewYersy (https://www.greenbeltonline.org/radburn-nj-garden-city-model-greenbelt/)

-City of Broadaccre: A new community plan

During the study of models, one of the most obvious characteristics of Broadacre City Isture that it unmasks many small lands and intertwined states. Almost every independent extension has one agricultural land attached to Toa. During the Soh Depression Age Toh 1930, Wright was not his own person who theorized that if people had a land, however small, they would make you able to live.

The city was a process, in leading a form. "

Nthony Puttnam, an architect of Taliens, who worked with Wright, believed that "the city of Broadacre challenges us to understand what we mean by democracy and how a city can be expressed. Urban America often seems indifferent to its physical composition. the majority of its people and shows a similar indifference the city of Broadacre proposes a physical structure and social adjustment to achieve the broader values of democracies. However, we can debate the practical foles of Broadacre City, we cannot overlook the challenge his. "

Rule the world. He had to understand that ideas inspired by spiritual integrity will alter the modern world. "

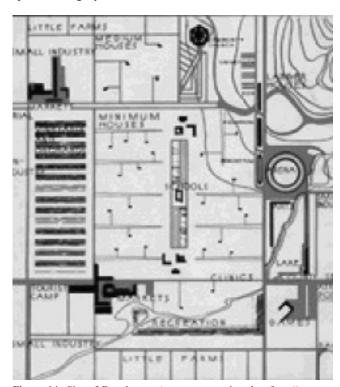


Figure 14. City of Broadaccre: A new community plan (http://courses.washington.edu/gmforum/Readings/Wright.pdf).

"The city must be everywhere and nowhere." This, according to Cornelia Brierly, as Frank Lloyd Wright described his concept Pair City Broadacre - a new type of city to pour landscapes changed with the ground and individual needs.

Wright saw this idea as lying on the ground and that it would take on different features depending on the terrain. The main thing was to have an architect who understood construction about the country and understood people's needs. "

The methodology is relevant to the project's unique issues and premise, which is that greater formal layering and adjacency reciprocate a more sustainable shape. This will be analyzed at form's sustainability in relation to the number and quality of formal layering and adjacency. Such information and characteristics were discovered, measured, and explored using typological, morphological, geometrical, and topological analysis. The success of such research was determined by the creative reinterpretation and reconsideration of concepts that we normally take for granted, such as: What are an intrinsic formal qualities and formal layering. Yet regarding the formal adjacency determination. The distinction between a typological, morphological, geometrical, and topological analysis on the case study of Tirana city through drawings provided within city visits and observations also analysis showed the sustainable and unsustainable elements theoretically and practically.

Conclusions and discussion

Further on in the readings of the maps as below, the foot of the building, the void, the roads, the natural-environmental networks, the natural elements and the overlap of the previously generated networks are highlighted as sustainable in this situation to speculate on a sustainable form of possible on which the city could be developed and a map with red color showing the development of the city until 2021 to see the differences of the

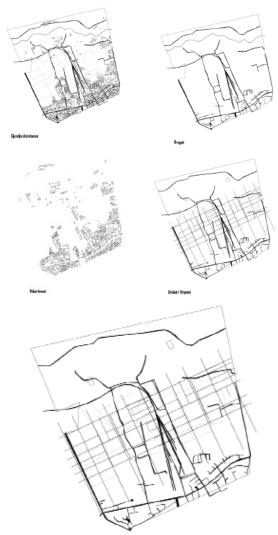


Figure 15. Reading the city through the combination of elements and the map of 2021 in red.

city's development in a visual form. (Figure 15)

The central idea of "After the Planners" (Goodman, 1972) is that planning and architecture are not goals in themselves, but rather exist to address the needs of actual people. Large-scale urban construction projects invariably serve to trivialize the in-

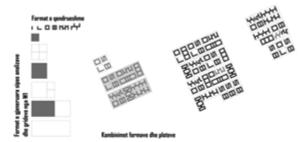


Figure 16. Generation of stable block shapes and their combinatorics together with the grid unit (square)

dividual's importance in the urban landscape.

Therefore, based on the recent findings and the presented diagrams, we have generated an alphabet with the combinations of stable forms of plots/plots from which we have also derived the stable forms of blocks. In addition to this alphabet and the analyzes of the early networks that have proved to be stable, we have obtained a resultant unit - that is, the shape of the square, which, combined with full and half, again creates larger square or rectangular shapes. Starting from a small unit of the form of the block inside the whole going to composite forms and variations on the same principle, many stable forms of the whole and the block can be generated without limit and with the combination or multiplication of this unit to create wholes bigger up to the cities. (Figure 16)

We place this alphabet of forms in the principle of sustainable networking, sustainable form, function and urban morpheme in a speculative way on the map of the years 1975-85 to see on another level the speculative implementation of the findings.

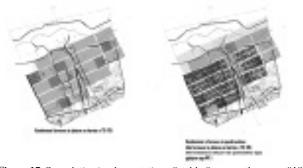


Figure 17. Speculative implementation of stable forms on the map of 1975-85.

These can be seen in figure 16.

From this point we combine the urban morpheme and the alphabet in diagrams, which is actually the method by which we arrived at the earlier conclusions, and now we read and interpret the findings through the diagram.

We first take the diagrams generated from the first findings and superimpose them with the sustainable forms of the blocks and based on the principles of sustainability that we have found, we build possible combinations depending on the characteristics of the terrain, the place, environmental factors and sustain-

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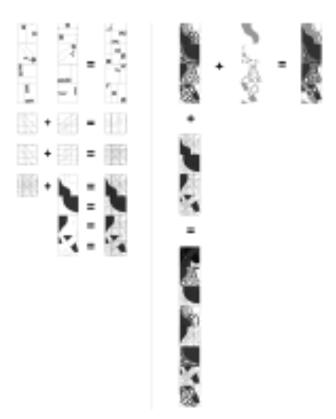


Figure 18. Combinations of diagrams with stable forms from earlier findings.

able forms. We present these as an equalization equation or with the analogy of a mathematical identity where the left part of the equation must be solved to be equivalent to the right part that is already solved or to be more precise it is a certain value. (Figure 17)

In this point of analogy of the mathematical identity, we try to synthesize the findings from the field, the diagrams, the reading of the city, the empirical way of analysis and from the literature. We divide the left side of the identity into 2 pairs of variables: variable variables and fixed variables, and both of these have a common denominator, which is shape. Variable variables include the specific environmental conditions that consist of a total of 5 elements named a,b,c,d,e. These are: terrain and specific conditions, climate, environment, and wind rose. These are variable because they are not the same for any country/city. On the other hand, we have the static variables that are urban morphemes, the buildings that follow the shape of the plot/block and their overlaps according to the diagrams. From this, consequently, we have the layout of an equation (that is, the left side of the mathematical identity consisting of: the shape of the plot plus the variations of the shape and the stationary block plus the variable variables (a,b,c,d,e) equal or equivalent to sustainable urban form. This is also illustrated through chronological diagrams. (Figure 18)

As a conclusion the urban morpheme and environmental conditions as variable variables and stable urban architectural forms as static variables - with the common denominator form, because environmental conditions also have a certain form in a certain place and the urban architectural form also has a certain form. So, with the combination of the invariable element of the urban architectural form and the variable variables of the specific conditions, we come to ideal sustainable forms in the formal aspect and the aspect of environmental, social, economic—so diversity and expansion were as an opportunity and added value at this big city still expanding in new ways.

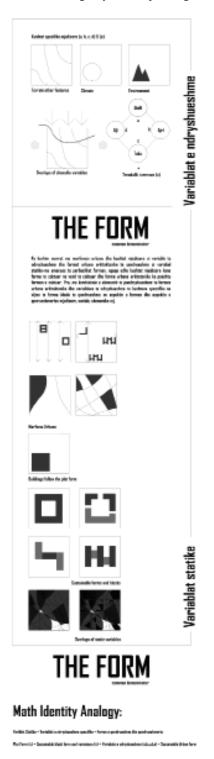


Figure 19. Diagrams and analogy of achieving sustainable form and sustainability

(Jacobs, 1961)

At this point the analogy of mathematical identity we tend to synthesize the findings from the terrain, the diagrams, the reading of the city, the empirical way of analysis and the literature. We divide the left side of the identity in 2 pairs of variables: variable variables and unchanging variables and both have a common denominator that is the shape.

Variable variables include specific environmental conditions consisting of a total of 5 elements named A, B, C, D, E. These are: terrain and specific conditions, climate, environment, and rose of winds. These are variable because they are not the same for any country/ city. On the other hand we have static variables that are urban morphemes, buildings that follow the shape of the parcel/block and their overlaps according to the diagrams. From this consequently we have the laying of an equation (ie, the left side of the mathematical identity consisting of: the shape of the parcel+ variacone variacs+ variable variables (a, b, c, e) equal or equivalent to the incomplete urban form. This is illustrated even through chronological diagrams. (Figure 19) This research deals with urban morphemes and environmental conditions such as variable variables and urban architectural forms stable as static variables-with common form, since environmental conditions have a certain form and urban architectural forms are also the specified form. Thus, with the combination of the unchanging element of the architectural urban form and variable variables of the specifical conditions in the formal constant forms and aspect of environmental, social, economic, etc. Figure 18.

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