

THE NEW PARADIGM OF URBAN ACUPUNTURE THROUGH BIOPHILIA:
ACTIVATING A NEW SUSTAINABLE FRAMEWORK THROUGH BIOPHILIC
PATTERN IN TIRANA'S NEIGHBORHOOD

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Approval sheet of the Thesis

This is to certify that we have read this thesis entitled “**The new paradigm of urban acupuncture through biophilia: Activating a new sustainable framework through biophilic patterns in Tirana’s neighborhoods.**” and that in our opinion it is fully adequate, in scope and quality, as a thesis for the degree of Master of Science.

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ABSTRACT

THE NEW PARADIGM OF URBAN ACUPUNCTURE THROUGH BIOPHILIA: ACTIVATING A NEW SUSTAINABLE FRAMEWORK THROUGH BIOPHILIC PATTERNS IN TIRANA'S NEIGHBORHOOD.

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At present, urbanization's dualistic nature has resulted in environmental damage and the emergence of social, cultural, economic, and other domain problems. Evidence shows the importance of natural design solutions to cope with today's problem developing a positive and sustainable urban living mode. There is a strong relationship between urban design and natural patterns, which led to this development; furthermore, Nature is involved in human well-being and other domains. Is it going back to basics the respond to the crises of sustainability in the world? What does it mean that Biophilic urbanism is the missing key in sustainable urban design? Why is the "urban upgrading through Going Biophilic" Strategy the new need of the future cities?

Cities are prior examples of urban fabric reflecting the existence of human-nature relationships and their opportunities. Sustainable urbanism asserts the need for a new paradigm that will reconfigure Nature's direct or indirect experience. This paper seeks to bring a fresh perspective of integrating Nature into cities' fabric through biophilic principles. Aiming for sustainable urbanism by upgrading the human-nature relation in the urban setting may be the new mindset of Nature as an urban acupuncture healer, exploring the overarching urban development while promoting sustainability.

The thesis will give an insightful overview of initiatives underway in Tirana's neighborhood in the near future. Observations arising from the research include:

- Biophilic behaviours, patterns, practices, lifestyles
- Biophilic attitudes and knowledge in Thermal Comfort & Cognitive Function

; by applying energy engineering modeling (evaluating phase)

SIMULATIONS and statistical energy modeling (predicting stage).

This paper discusses existing research from multiple standpoints to provide a clear insight into how this can have a practical application, especially to the matter challenge of "urban upgrading" in Tirana, by reflecting on the biophilic urbanism concept.

Keywords: *A Human-Oriented Design; Biophilic Patterns; Biophilic Urbanism; Sustainability; Urban Comfort; Urban Upgrading.*

ABSTRAKT

AKUPUNKTURA URBANE PËRMES KONCEPTIT TË BIOFILISË: PROMOVIMI I NJË STANDARTI TË RI NË ZHVILLIMIN E QËNDRUESHËM URBAN, NXITUR PËRMES MODELEVE BIOPHILIKE NË TIRNAË.

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Natyra dualiste e urbanizimit ka rezultuar në degradimin e mjedisit si dhe krijimin e shqetësimeve në fusha të tjera, sociale, kulturore, ekonomike. Studimet demonstrojnë rëndësinë e zgjidhjeve natyrore në trajtimin e sfidës së sotme të krijimit të një stili jetese urban pozitiv dhe të qëndrueshëm. Ky zhvillim është rezultat i një lidhjeje të fortë midis modelit urban dhe modeleve natyrore; për më tepër, natyra është e përfshirë në mirëqenien e njeriut dhe sfera të tjera.

A po kthehemi tek zgjidhjet tradicionale si një kundërpërgjigje e qëndrueshme? Për më tepër- a është biofilia celsi i një zhvillimi të qëndrueshem urban dhe nevoja më e re e qyteteve të ardhshme?

Ky kërkim synon të hulumtojë një perspektive të re të integritit të Natyrës në strukturën e qyteteve përmes parimeve biofilike. Urbanizmi i qëndrueshëm pohon nevojën për një paradigmë të re që do të rikonfigurojë përvojën direkte ose indirekte të natyrës. Synimi i urbanizmit të qëndrueshëm duke azhurnuar marrëdhënien njeri-naturë në mjedisin urban mund të jetë një pikëpamje e re që eksploron natyrën si një shërues i akupunkturës urbane, duke promovuar qëndrueshmërinë.

Kjo teza do të japë një pasqyrë gjithëpërfshirëse të iniciativave që po zhvillohen në lagjen e Tiranës në të ardhmen e afërt. Vëzhgimet që dalin nga kërkimi përfshijnë:

- Sjelljet, modelet, praktikat, mënyrat e jetës biofile

- Qënfrimet dhe njohuritë biofilike.

; duke u përqëndruar në idenë e urbanizmit biofilik, ky artikull analizon gjendjen ekzistuese nga pikëpamje të shumta për të siguruar një pasqyrë të qartë se si kjo mund të ketë një zbatim praktik, veçanërisht për problemin aktual të "azhurnimit urban" në Tiranë.

***Fjalët kyçe:** Një projekt I Orinetuar nga Njeriu, Model Biofilik; Urbanizëm biofilik; Zhvillim i Qëndrueshëm Urban; Komoditeti Urban; Azhurnimi Urban.*

Dedicated to my family.

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CHAPTER 1

INTRODUCTION

1.1 Background (Problem Statement)

The recent decades are defined as the "Anthropocene era," enable humans to have the upper hand over the ecosystem (Crutzen, 2005). Jianguo Wu defines cities as the core of socio-cultural transformations, the generator of economic growth, and the primary key to innovation and building knowledge (Wu, 2009). The crucial qualities of cities cover the delightful architectures that symbolize them, stimulative for the fascinating history of human civilization that elevate them, and attractive for the options and amenities that they provide. Kofi Annan, the previous Secretary-General of the UN, has pointed out: "The future of humanity rests in cities." But on the other hand, cities have met rapidly ongoing concerns involving weather changes, resource deficiency, population extension, urbanization, and economic difficulties.

From this complex and multidimensional dilemma perspective, efforts are made to locate quick and evolutionary solutions. It leads to sustainability as one of the main cities' main subjects, arising as the space in which our balance with urban Nature must be reconsidered and restored.

On the the other hand, due to urbanization causing a significant impact on population growth in cities and climate change, urban Nature is increasingly recognized for its essential role in maintaining urban areas' livability and sustainability.

No prescription is available, but it is clear that sustainability and Nature play a useful role in this sense of purpose. Natural design frameworks known as Biophilia assist affords to respond as a new strategy of sustainability. Biophilia', meaning an innate love or attraction to the living world, was coined by psychologist E. Fromm in 1961, was redefined upon upon by biologist E.O. Wilson in 1984 (Wilson1984), and expanded further by social-ecologist S. Kellert and others. It is a useful paradigm to deal with the city of the future's challenges and sustainability by reinterpreting and enhancing the human-nature relation in the urban context (Kellert S. R., 2005).

A new dimension of sustainable development focusing on the urban environment's quality and well-being is analyzed by Biophilia and biophilic design & urbanism (Beatley, Handbook of Biophilic City Planning & Design, 2016). To reach the final point designs that aim to intentionally generate human-nature relationships or make use of these to strengthen human well-being are proposed.

The fundamental purpose of this paper is to look into the urban configuration factors affecting the different domains and propose a new sustainable framework through engaging biophilic patterns. The paper will situate the emerging image of biophilic urbanism within evidence-based research from countless disciplines, offering an understanding of how this can be put into practice, particularly to the topical challenge of "urban upgrading" Tirana. Biophilic behaviors, patterns, techniques, lifestyles will be identified and then applied in the Tirana context to discuss opportunities and challenges for actual implementation.

1.2 Purpose of the study

Tirana City is well known for being a challenging subject of a city undergoing transition. It can be described as one of the most dynamic cities in Europe and represents a city of typical and prolonged growth, which remains still the primary and most dramatic challenge of the present day (Aliaj, 2003).

The study aim is to identify a new Sustainable Urban Living Mode in Tirana's Neighborhood exploring:

- The role/ impact of Biophilia in Placemaking by understanding the use of biophilic principles in urban environment.
- A method to measure the level of biophilia in Tirana City that takes into consideration all biophilic urbanism principles all scale scoring.
- Seek to identify opportunities and constraints to implementing biophilic design

1.3 Research Objectives

A detailed framework will examine the biophilic elements in Tirana's neighborhoods despite conducting a literature review on biophilic urbanism to identify a biophilic design's features. The research goal is to identify and test biophilic patterns' effectiveness through an application in the selected areas.

- Define **Biophilia** as the core of the thesis_ A New Sustainable Key.
- Investigate **Existing biophilic** literature.
- A strategical
- A strategical framework to integrate indoor outdoor spaces with biophilic consideration.
- Determine which elements must be considered to measure biophilia in the city.
- Create a **matrix** that indicates what are the levels of biophilia in Tirana's case_ Determine the level of Biophilia in Tirana.
- Identify the importance of **Biophilic Application**

1.4 Research Questions

- Considering the case of Tirana, how can biophilic design be applied in order to create a multi-use space, offering Tirana's community access to nature in both direct and indirect ways?
- How to bridge the gap between Biophilic Design and Tirana' Urban Space?
- What are the existing strategies and patterns of biophilic design in Tirana Case?

Sub Research Questions:

- How can biophilia be measured while ensuring that all elements of what makes a biophilic city are included?
- What is the Tirana's Degree of Biophilia, and what features of Biophilia may be identified there?

1.5 Scope and Limitations

The application scope of biophilic design is various, from city to occupant scope (scale). An integration between different sizes as well as the transition between functions. However, there is a lack of case study of biophilic design and data in Urban Design, specific to Tirana as well as a lack of an evidence base to support application of biophilic design.

Studying on biophilic design features and their impacts on individuals may be various as users can have diverse reaction based on their own perception and experience with their environment.

Despite all, this paper Tends to understand how implementing Biophilic Patterns directly impacts (Social, Environmental, Space) Quality, Health, Efficiency in Tirana's neighborhoods.

1.6 Thesis Outline and Expectations

1. Dimensions of sustainable urban developments and today's strategy of Biophilia.
2. Biophilic Design_ a literature review on biophilic urbanism to identify the features of a biophilic approach.
3. Understand how biophilic patterns can be included in the urban environment and their role in placemaking
4. Biophilic categories behaviors, patterns, practices, lifestyles, attitudes, and knowledge.
5. Establish site selection criteria and select a site to apply the design principles
Variables Analysis_ Chosen Neighborhood Analysis
6. Analyze The site through aspects of biophilic city features_Test the effectiveness of the Biophilic Principles by applying them to different land use typologies.

7. Critically reflect on the application of biophilic city principles to the selected areas.
8. Establish a new strategy using Biophilia that offers a response to environmental and social justice issues.
9. Mobile temporary structure_parklets; pop up gardens' city tree canopy.
10. Learn how biophilic design can help in thermal comfort & Cognitive Function

CHAPTER 2

THEORETICAL BACKGROUND

Literature examination on biophilic urbanism, identifying biophilic features in the urban environment, and a critical reflection on applying the Biophilic approach.

2.1 Design Strategy: Biophilia What? Why? How?

Since World War II, the built environment tendency has been focused on separating people from nature. People who work and live-in cities, in particular. Individuals began to become urban residents in recent years, and more people would prefer to live in cities for the sake of a fast-paced lifestyle, rather than in the countryside. It is also predicted that 70% of the world's population would stay in the developing nations (Green, 2014). Interacting people to nature is becoming increasingly vital and necessary (*Figure 1*). As well as sustainability, due to natural resource constraints. Urban dwellers are tired of the daily grind and want for a place to unwind and reconnect with nature. So, the quest is to find inner delight, let go of their won nature, and become one with nature.



Figure 1. Biophilic Urbanism Benefits (Source: Mary Allen, 2019)

Biophilia is the tendency to be close to nature. It is the affection and reverence for a live individual or object. Nature is the wellspring of life, and architecture is the

unseen umbilical cord that connects us to it. It is not a new approach; rather, it can be traced back to the Hanging Gardens of Babylon, when humans strengthened their connectedness to the natural world. I am fully aware that biophilic design will replace the current building system, redefining modern architecture, living and working styles for humans, and becoming the mainstream and critical role in the future, not only for human well-being or aesthetic reasons, but also for environmental sustainability (Zhang, 2020).

Modern architecture has met the demand due to the rapid advancement of design and construction technologies. The most fundamental barrier is stability and practicality. Biophilic technique is an effective idea that encourages a harmonious interaction between human living habitation and environment, rather than chasing efficiency and sustainability through high-tech solutions. Designers, architects, and urban planners should incorporate new possible approaches toward a healthy lifestyle and placemaking as a significant duty rather than remaining in a concrete box.

What is the importance of Biophilia? The value of nature in the built environment is emphasized by biophilic design and urbanism. It also enhances people's awareness of environmental behaviors and modifications, as well as green lifestyle attitudes, therefore achieving the objective of environmental sustainability. In other words, biophilic design is a green method that includes more than just plants, natural light, vistas, and the sense of the natural world.

Second, biophilia in sustainability is important both for environmental concern and understanding, but also for economic and social advantages. The spatial experience of users is also essential, either physically or emotionally.

Third, not just for environmental or cultural reasons, but also to promote emotional connection to the surrounding environment or culture among current users. Bring people back to nature and promote an intrinsic love of nature, while also growing users' obligations to the environment and life.

It is stated that health is the new green, and that Biophilic Cities are the way of the future. The effects are evident, and as research has demonstrated, they are a driving force in the creation of sustainable, nature-centric places.

2.2 Dimensions of Sustainable Urban Development and Today's Strategy of Biophilia

As the world is heading on the age of urbanization, a metropolitan century is not far from being accomplished, as people are on an incredible trek pursuing the cities. In contrast, around 54% of the world's population is already urbanized (Greg Clark, Tim Moonen, Jake Nunley, 2018). Since 1990, we face an incorrect definition of development that came after the Industrial Revolution due to the optimal use of the resources leading to significant environmental challenges (Luis Serra, Miguel Lozano, Jose Saravia, 2019). Urban footprints of cities are quite alarming, inevitably showing how urban fabric dominance has already threatened natural assets. In this regard, it requires sustaining this confrontation and grow awareness toward naturalistic aspects.

Growing concerns on urbanization development are urging the need for new approaches, which will deal with the consequences such as built environment and urban areas explosion at an extraordinary rate, not seen in any other time in human history. According to UNEP, many cities are already having a hard time struggling with many issues, as they are continually increasing, same as their demands to accommodate people. Environmental deterioration, traffic tie-up, inadequate infrastructure services, and a lack of necessary facilities, such as water, energy, transport, sanitation, information are remaining a constant problem (Supporting resources efficiency, n.d.). Cities continue to be at the center of life. At the same time, they are not immune from these urbanization concerns (Peter Newman; Tim Beatley; Heather Boyer, 2012). Due to these problems, it is necessary to find factors to support clean, sustainable, and renewable energy and resources (Dodman, Blaming cities for climate change? An analysis of urban greenhouse gas emissions inventories, 2019).

But what kind of future cities should we embrace/pursue?

The sphere of this complex and multidisciplinary problem requires identifying new sustainable movement and other nature-driven approaches, which will offer quick and transformational solutions (Elham Asadzadeh, Maryam Yousefi Ahmadchali, 2018). The literature on neighborhood planning movement throughout the years has presented new theories such as the garden city (Howard, 1965), green City (Campbell, 1996), eco-city (Register, 1987), livable City (Li & Guo, 2006), green roof

(Sailor,2008) and the green wall (Shelton,1994) to keep up the environmental aspects of cities (Keramatollah Ziari,Ali Hosseini,Ahmad Pourahmad,Bagher Fotouhi Mehrabani, 2018). Today as never before, government institutions are searching for solutions to boost well-being and social cohesion and, in the meantime, examine the opportunity scope for innovations in clean air, clean water, and clean energy (Biophilic Urbanism, n.d.). At finally, at the end of 20 century, has been a worldwide set of initiatives to integrate sustainability principles into neighborhood progress. As Modernity is now taking away man from Nature, it is vital to attempt new solutions to reduce this particular gap. A sustainable solution that focuses on meeting the present's needs without compromising future generations' ability to meet their needs (*Figure 2*) (Pranjale-Bokankar, 2020).

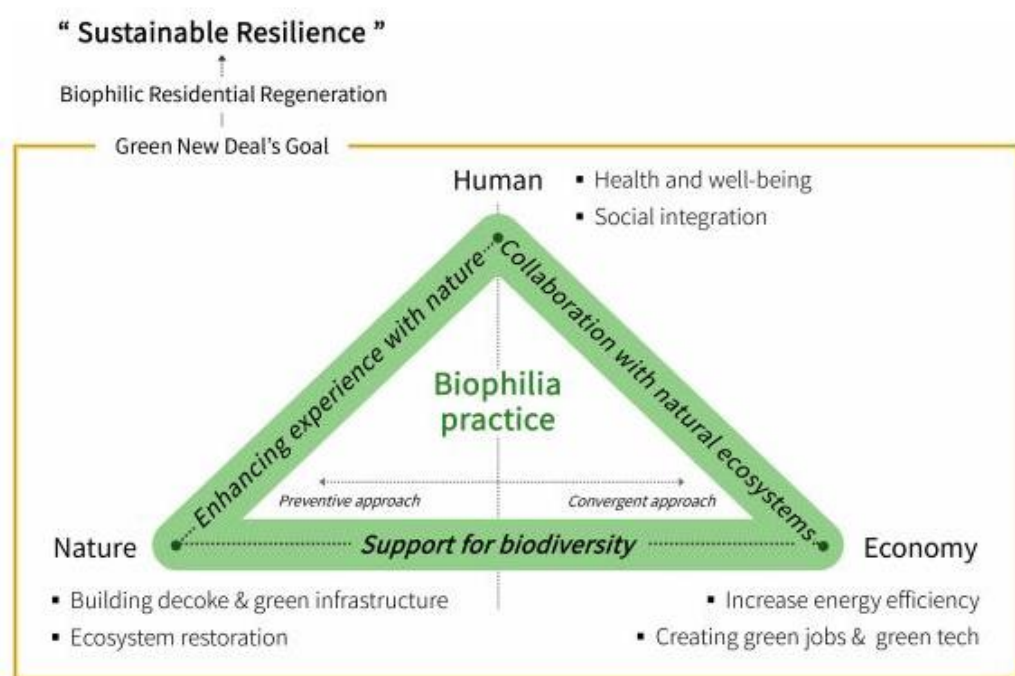


Figure 2. The link between Sustainability and Biophilia (Source: Lee, E.J.; Park, S.J. Toward the Biophilic Residential Regeneration for the Green New Deal, 2021)

Between multiple efforts of fostering sustainable development, Biophilic design aims to enhance Nature into our built environment to restore a strong connection between humans and their natural habitat, promoting human health and well-being. It has played a significant role in the Nature-driven architecture movement and sustainable urban development as a piece of evidence of the need to re-evaluate our approach to be more socially and ecologically responsible (Wolfs, 2015). Biophilic Ideology is a sustainable approach that emphasizes the importance of maintenance,

enhancement, and restoration of user experience on the use of Nature in the built environment, incorporating natural light, materials, nature views, vegetation (Pranjale-Bokankar, 2020). In current years, achieving sustainable development recognizes biophilic patterns, showing how nature assets contribute to urbanism domains such as space, social, environmental quality, and directly impacting the city and community's health and efficiency.

2.3 The Role of Biophilia in Placemaking

Placemaking, or the co-called Sense of Place, is "a crucial idea and an actual tool that aims to upgrade the neighborhood, city or region" (Walljasper, 2015). It is "a broad perspective to the planning, design, and management of public spaces" that "assist local community's resources, encouragement, and capacity to create decent public areas that advocate people's health, efficiency, and comfort" (Walljasper, 2015).

Gregory Bateson's observations show how critical issues in the world sense of place connect with the difference between the way Nature works and how people and cities proceed. On the other hand, Janine Benyus claims that Biophilic Design is the approach that recognizes Nature's contribution to our well-being (Dias, 2015).

However, what role does Biophilia play in placemaking? How might we practice Biophilia to promote sustainable urbanism?

The term Biophilia arises out of the Greek roots implicating the Love of Nature. In summary, it signifies the love for life and living things in the word, as a word combination between "bio" of the "philia," or in other words "life or living things" and "love." Erich Fromm was the first to use Biophilia, describing a psychological attitude of being drawn to all that is alive and vital. Later on, the term became popular when Edward Osborne Wilson, an American biologist, wrote the book "Biophilia" in 1984, defining it as the bond that human beings subconsciously try to obtain with the rest of life". A set of standards for the biophilic design is mentioned in Stephen Kellert's literature, a reverted social ecology professor. Known as the "Godfather of Biophilia," he proposed the possibility of 6 elements that are (Kellert S. r., 2018):

- Environmental Features
- Natural Shapes and forms
- Natural Patterns and Processes
- Light and Space
- Place-based relationships
- Evolved human-nature relationships

The definition went one step further after translating the natural understanding into the design, both architectural and urban scale. Biophilic design is about humanity's place in Nature and the natural world's place in humankind's society. Interexchange, respect, and enriching relationships can and should exist at all levels and should emerge as the norm rather than the exception (Stephen R. Kellert, Judith Heerwagen, Martin Mador, 2008).

As the impact of urbanization is exceptionally evident, many cities bear with social and environmental problems, which have negatively impacted people's well-being and resulted in numerous cities. The crucial role in improving its residents' aesthetic and ecological quality of life seems to be building-integrated greenery systems and urban green spaces (Pranjale-Bokankar, 2020). Biophilic urbanism aims to draw attention to the physical setting, urban design, lifestyle, attitudes, and experiences by emerging as a planning and design framework, boosting urban space development (Alessio Russo, Giuseppe T, Cirella, 2020) (Russo, 2014). Both Kellert and Beatley proposed sustainable design strategies to bring together people and Nature. One of Beatley's and scholars' leading discussions wrapped up suggesting using natural qualities holistically into a larger urban environment besides the buildings. He launched the global Biophilic Cities Network to provide resilient cities through nature connection and foster the awareness of the urban environment. Both Beatley, 2013 and Downton, 2017 defined physical design's critical qualities on how a biophilic city should be described and illustrated (Rohayah Che Amat, Mohammad Hussaini Wahab, 2020).

Research had shown nature contact is beneficial to people, and all urban dwellers should have direct access to, not just those who can afford to live on the edges of parks and green belt open spaces (Tim Beatley, Peter Newman, 2013).

Biophilic cities are the newest urban design concept that defines how communities should incorporate with the natural environment and how residential areas should grow together with green by protecting their natural biodiversity. A great example of a Biophilic city is Singapore, well-known for its compactness, embracing the "city to the garden" philosophy. The focus consists of developing green areas and green buildings, regenerating the city's natural idea, and creating "a back to origin" type of urban ecosystem (Cirella, 2020).

Case studies found worldwide are introduced, displaying detailed biophilic planning and design strategies. Biophilic urbanism offers a nature-based urban environment and leads to natural patterns in cities' social and physical understanding.

In recent years, Biophilic urbanism seems to be the perfect sustainable framework. Going biophilic appreciate direct contact with Nature, but it is responsible for utilizing natural resources and plan according to the world's most prominent climatic condition and local ecological processes (Tabb, Biophilic Urbanism: Designing Resilient Communities for the Future).

The associated concepts of Biophilia, biophilic design, and biophilic urbanism can guide placemaking considering all necessary domains. Nature-driven approaches will promote real contributions such as space quality, human well-being, and delivering substantial social and economic benefits in cities.

2.4 Obstacles and opportunity of Biophilic Urbanism Framework

As mentioned above, various researchers have identified biophilic design elements in architecture and interior architecture (Stephen R Kellert, Elizabeth Calabrese, 2015) and urban settings (Beatley, 2011).

An increasing number of cities such as Berlin, Portland, Chicago, Toronto has adopted Biophilia Urbanism, focusing on receiving direct and indirect benefits. Around the world seems to have a highly comprehensive urban greening program driven mainly by urbanization concerns. Combining Nature into the built environment

is strongly favored by citizens whose urban Nature experience has moved to a high comprehension of their financial, social, environmental, and personal benefits (Newman, Prof. Peter, Karlson James Hargroves, Cheryl Julia Kiran Desha, Angela Reeve, 2012).

Urban designers, such as Jan Gehl (Peter Newman, Annie Matan, 2016), have critical remarks toward modernism planning ideologies and how they turn down the value of streets and communities by allowing cars to invade every available space in cities. Through series of reports, Gehl established a new approach to reach close interaction between people enabling social, eco, and environmental benefits, to ensure welcoming spaces in daily life (Gehl, *Cities for People*, 2010). As the cities are changing, so are their urban areas, streets, neighborhoods. Biophilic urbanism enriches Gehl's 12 quality criteria concerning the pedestrian landscape along with added patterns of Biophilia (Gehl, *Life between buildings. Using public space*, 2011); (Dodman, *Blaming cities for climate change? An analysis of urban greenhouse gas emissions inventories*, 2009).

The biophilic design attempts to achieve people-nature contact benefits by integrating natural assets internally and externally into buildings, built infrastructure, and across the urban space. By adopting this strategy, design solutions at multiple scales will prompt and regeneration of the natural system in the urban environment (Agata Cabanek, Peter Newman, Maria Elena Zingoni de Baro, 2020). The research examination has classified biophilic urbanism into three leading scales: the building, neighborhood, and city scales, as specified in Table 1. Biophilic design patterns and elements can contribute to various benefits at all scales. As shown at the building scale, green roofs and green walls lower energy demand and enhance water management. In contrast, at upper scales, biophilic elements help mitigate urban heat islands' impact, improving air quality and the microclimate. Biophilic design elements will obtain significant advantages across all scales in cities by their application. The many implications of biophilic urbanism introduce opportunities available for the design of cities and communities worldwide, with a rising number of politicians gaining considerable public assistance for programs to integrate Nature within cities and embrace going biophilic

Aspirations for urban development are in constant shifting. Both Governments and citizens alike are ever more in need of smart, sustainable, sophisticated urban

design solutions to meet the urgent issues cities face. Achievements require multifaceted demands and deliver aesthetic, social, and environmental benefits besides innovative approaches to meet ever-increasing infrastructure and other facilities' ever-increasing requirements. To establish such a sustainable framework is necessary to provide an actual mapping of current biophilic sites or elements of a city. The following biophilic urbanism framework distinguish and classifies around 30 unique characteristics of biophilic cities, defined by combining various aspects of cities regarded in unique relationships between people and Nature as described by Beatley (2011,2016) (Zari, 2019)

As already mention by Calabrese, there are three main categories of Nature's experience elaborated by the Biophilic Design Approach. These involve the Direct Experience of Nature, the Indirect Experience of Nature, and Space and Place's Experience (Stephen R Kellert, Elizabeth Calabrese, 2015).It is proven that experiencing nature interaction will provide a positive impact on people's attitudes and behavior. Evidence indicates how enabling urban dwellers to connect with natural assets directly, or other biophilic spaces and elements increase physical and psychological well-being. It comes along with a robust understanding of local and and global Nature's values (Frans J. Sijtsma, Rixt A. Bijker, 2017). The Nature of spaces and places expresses the natural ability to make spaces feel safe, more attractive, and relaxing.

A growing body of evidence verifies how biophilic patterns or natural assets and green infrastructure (green roofs, green walls, street trees, community garden, tree canopies) have direct and indirect input in urban development. The participants of two project stakeholder workshops, created by Emeritus Professor Valerie Brown, proposed a group of potential elements based on 'Collective Social Learning'¹⁰. The proposal consists of quick identification of barriers and opportunity points on the biophilic application (SBEnrc, 2011).

Barriers found (Angela Reeve, Peter Newman, 2012):

1. **Restricted local studies and data** on biophilic elements, preventing decision-makers from providing informed and proper decisions.

2. Inequality **support** of benefits and costs of biophilic urbanism by government institution or stakeholder.
3. A "**silo effect**" restricts government and worsened demotivation. Inadequacy of requirements makes biophilic urbanism a 'beyond compliance' follow-up to building and planning. Biophilic urbanism elements are not assisted by current regulation and planning conditions.
4. **The nature disconnection** causes a Cultural disconnection from natural environments causes unawareness of the benefits of Nature's experiences and an absence of greening policies to increase urban Nature.
5. **Traditional economies** do not appreciate decision-makers, including biophilic elements in urban and building design.

Existing opportunities identified:

1. **Several flexible policies** and **design standards** promote and urge innovative performances.
2. Supportive policy measures introduced by **creative leaderships**, willing to trial and adopt innovation. Their focus is to enrich the community, not just for political and economic purposes.
3. **Current social assets**, community groups, community gardens, and community understanding biophilic urbanism. Community leaders and change agents assist in educating their community, establishing norms, and supporting political processes
4. "**Biophilic entrepreneurship**" provided by the private sector.
5. Evidence demonstrating the numerous **benefits of biophilic urbanism**.

2.5 Biophilic Indicators

Tuning with Nature, it is argued to be a sustainable and resilient move used increasingly by all over the world cities. They are implementing a host of biophilic programs, policies, and initiatives to find help in social and landscape resilience,

natural and economic disasters, and other future uncertainty. It is essential to understand the biophilic urbanism indicators, attitudes, patterns, and application methods to make room for more tentative and future research (*Figure 3*).

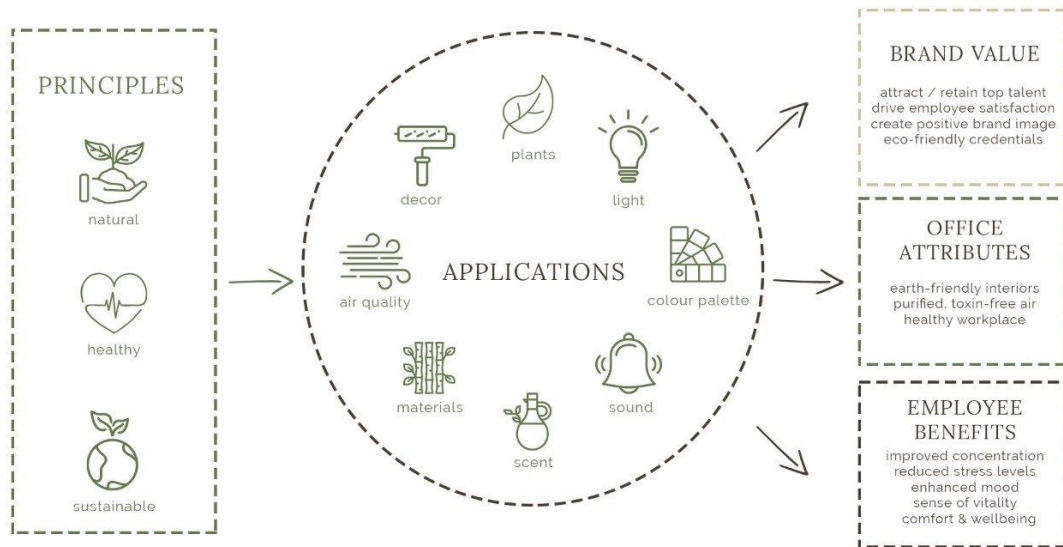


Figure 3. Biophilic Urbanism Principles,Application,Benefits (Source: Eva Podgorska,2019)

2.5.1. Application Scales of Biophilic Cities

Social, environmental surroundings, and transportation are three crucial dimensions taken into consideration by biophilic urbanism (Tabb, 2020). They introduce a broad range of matters: creating public gathering spaces; opportunities for interaction; parks & recreation; ecological corridors; the reduction of greenhouse gas emissions; pedestrianization. As stated by Peter Newman (Newman, Prof. Peter, Karlson James Hargroves, Cheryl Julia Kiran Desha, Angela Reeve, 2012), it is essential to indicate the scale and density of Biophilic Urbanism. The broad list of urban issues intended to be accomplished by Biophilic outcomes leads to re-address biophilic practice at each of the urban scales. These scales vary from building interior to the ecological regions at which a community may be (*Table 1*). Particular qualities exist on this variety of environmental biophilic levels of application (Tracada, 2013). The application sales in question include individual buildings, streets, blocks, neighborhoods, communities, and ecoregions.

Table 1. Biophilic city design elements across scales: first arise in Beatley.

Scales	Biophilic Design Elements
Building	Green Rooftops
	Sky Gardens & Green Atria
	Rooftop Garden
	Green walls
Block	Daylit Interior Spaces
	Green Courtyard
	Clustered Housing around Green Areas
	Native Species Yards and Space
Neighborhood	Green Streets
	Urban Trees
	Low Impact Development
	Vegetated Swales and Skinny Streets
	Edible Landscaping
	A High Degree of Permeability
	Stream Daylighting, Stream Restoration
	Urban Forest
	Neighborhood parks/pocket parks
	Greening grey fields and brownfields
Urban Creeks and riparian areas	
Community	Urban ecological networks
	Green Schools
	City Tree Canopy
	Community forest/community orchards
Region	Greening Utility Corridors
	River System/Floodplains
	Riparian Systems
	Regional Greenspace System
	Greening Major Transport Corridors

2.5.2. Innovative Dimensions of Biophilic Cities

Tracking down the various conditions and circumstances that occur or cities aim is the basic understanding of what Biophilia is. The first important point is the physical and direct access to Nature, which leads to the essential need for infrastructure investment. In other words, Biophilic cities are walkable and easily accessible to natural assets. City planners are taking this standpoint into account when intervening in the city. Parking rights, encouraging a diversity of uses, making cities more hospitable, cycling, and planting more trees are the ten means to give rise to walkable cities, pointed out by Us city planner Jeff Speck (Speck, 2013). Biophilia shapes the way we build cities"- Dr. Stephen Kellert from Yale University School of Forestry and Environmental Studies. The second, by not the least essential of the current indicators

of Biophilia, are Activities. Biophilic urbanism is all about the experience with Nature to promote well-being and efficiency, (Table 2). It suggests value dimensions foster new ways of connecting with Nature. Finally, the Biophilic Institutions and governance play an essential role in environmental education and cities' nature management and funding (Beatley, 2011).

Table 2. Dimensions of Biophilic cities. Summarized by Beatley, 2011.

Indicators of Biophilic Urbanism

Biophilic Conditions and Infrastructure

Percentage of the population within a few hundred feet or meters of a park or greenspace; --Percentage of city land area covered by trees or other vegetation

Number of green design features (e.g., green rooftops, green walls, rain gardens);

Extent of natural images, shapes, forms employed in architecture and seen in the city; --Extent of flora and fauna (e.g., species) found within the city;

Biophilic Behaviours, Patterns, Practices, Lifestyles

The average portion of the day spent outside;

Visitation rates for city parks; --Percent of trips made by walking;

The extent of membership and participation in local nature clubs and organizations;

Biophilic Attitudes and Knowledge

Percent of residents who express care and concern for Nature;

Percent of residents who can identify common species of flora and fauna;

Biophilic Institutions & Governance

Priority is given to nature conservation by local government; percent of municipal budget dedicated to biophilic programs;

Existence of design and planning regulations that promote biophilic conditions (e.g., mandatory green rooftop requirement, bird-friendly building design guidelines);

Presence and importance of institutions, from aquaria to natural history museums that promotes education and awareness of Nature;

Number/extent of educational programs in local schools aimed at teaching about Nature;

Number of nature organizations and clubs of various sorts in the city from advocacy to social groups;

2.5.3. Biophilic Cities Pattern and Principles

Biophilic Urbanism represents a framework that indicates human-nature bonds in the urban setting to improve people's and cities' lives.

Studies point to the importance of consolidating this Connection, boost the priority level among both studies and practice, and better understand the patterns of

Biophilia. There are 14 patterns, with a broad application scope for interior, exterior, building, and urban environments. They ought to be easily adaptable and versatile, coming to the proper project implementation. Empirical Observation and the work of Christopher Alexander Rachel and Stephen Kellert, Roger Ulrich, and lots more are taken into consideration to develop them (William Browning; Catherine Ryan; Joseph Clancy, 2014).

1. Biophilic Pattern Attributes:
2. Nature-Based Patterns
3. Element-Based pattern
4. Form-Based pattern
5. Place-Based pattern
6. Numnous-Based pattern

Table 3. 14 Patterns of Biophilic Design by Terrapin Bright Green

Biophilic Design Principles	Patterns of Biophilic Design		
Design Narratives	Nature in Space	Natural Analogue	Nature of the Space
	Visual Conection w/ Nature	Biomorhic Firms & Patterns	Prospect
	Non-Visual Connection w/ Nature	Material Connection w/ Nature	Refuge
	Non-Rhythmis Sensory stimuli	Complexity & Order	Mystery
	Thermal & Airflow Variability		Risk Peril
	Presence of Water		
	Dynamic & Diffuse Light		
	Connection w/ Natural Systems		

2.6 Urban Acupuncture and BUA

Jaime Lerner developed the phrase "urban acupuncture" (*Figure 4*), which refers to the concept that little focused pinpoints of change within the urban environment might have a positive effect. "Good acupuncture is about assisting the city in being a catalyst for human connections..." (Lerner, 2014)

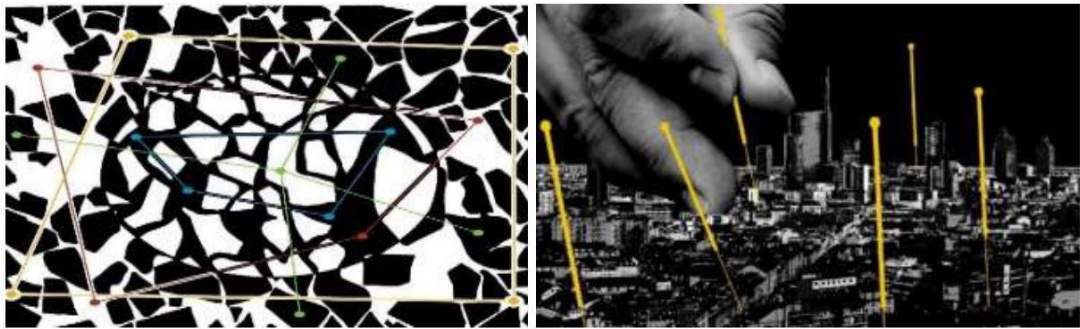


Figure 4. Urban Acupuncture Network by Marco Casagrande (Source:Google image)

Urban Acupuncture is a socio-environmental paradigm that blends contemporary urban planning with traditional Chinese acupuncture, employing small-scale interventions to change the broader urban setting. Acupuncture is used to reduce tension in the human body, while urban acupuncture is practiced to relieve stress in the built environment. The goal of urban acupuncture is to create small-scale but socially catalytic interventions in the urban fabric. There is no need for needles.

Good urban acupuncture is also the art of generating knowledge about the city... because we rarely pay attention to what we don't know, how can we hope to instill respect for a city we don't understand? (Lerner, 2014)" Biophilic urban acupuncture is created by applying biophilic design ideas to urban acupuncture. We relate the significance of place creation in urban acupuncture to the value of connection to place in biophilic design by doing so. This opens up the possibility of improving people's quality of life through sensory-rich encounters at a scale that is not just possible for cities to execute, but also at a small size that allows for direct engagement of people on the street.

Biophilic Urban Acupuncture (BUA) is the concept that threads and nodes of biophilic interventions in certain urban settings may enhance people's emotions, link

them to place, and promote mental health. Biophilic urban acupuncture combines two critical design concepts: biophilia and urban acupuncture. Because of the accessibility of pedestrian movement, BUA is more successful in dense cities than in suburban areas. A resident in a dense city will spend at least some time outside each day because they will be walking to transportation, walking to work, or walking to acquire a meal. Even while BUA is certainly required in more suburban areas, the auto-centric roadway design and stretched land-use generally do not lend itself to high-quality biophilic possibilities.

2.7 A global Review of the Biophilic Practices

Sustainability will remain elusive unless there is a fundamental transformation in our values and ethical relationships with the natural world. The implementation of biophilic design will be effective if it recognizes how much nature still serves as the foundation for a healthy, productive, and meaningful human living.

“Nature is a component of our humanity, and without some understanding and experience of that divine mystery, man ceases to be man,” wrote Henry Beston (Benston, 2013).

Biophilia and biophilic design are about our ideals and ethical duty to the natural world's care and sustainability. A commitment to maintaining and even enriching our relationship with nature demands a far broader concept of human self-interest, which encompasses not only monetary advantages, but also a slew of emotional, intellectual, and even spiritual benefits.

Biophilic design entails the use of many design techniques (*Table 4*), which we refer to as experiences and characteristics. The decision on which design applications to utilize is necessarily influenced by the circumstances and restrictions of a project, such as specific building and landscape uses, project scale, different economic,

logistical, and regulatory considerations, as well as cultural and ecological contexts (Stephen R Kellert, Elizabeth Calabrese, 2015).

As previously stated, efficient biophilic design practice necessitates adherence to the previously mentioned criteria. Most importantly, biophilic design should never take place in a fragmented or unconnected manner, but rather in a way that the many applications mutually support and complement one another, resulting in an overall integrated ecological whole. The core categories of our biophilic design paradigm are three types of natural experiences. These include direct experiences with nature, indirect experiences with nature, and experiences with space and place. The term "direct experience of nature" refers to direct interaction with environmental characteristics in the built environment, such as natural light, air, plants, animals, water, landscapes, and others that will be discussed. The term "indirect experience of nature" refers to contact with a representation or picture of nature, the alteration of nature from its original state, or exposure to specific patterns and processes characteristic of the natural world.

These include pictures and artwork, natural materials such as wood furnishings and woolen fabrics, ornamentation inspired by natural shapes and forms, or environmental processes that have been important in human evolution such as aging and the passage of time, information richness, natural geometries, and others. Finally, the sense of space and location refers to natural environment spatial elements that have improved human health and well-being. Prospect and shelter are two examples, as are structured complexity, mobility and navigation, and so on. Within these three areas of experience, 24 biophilic design characteristics have been found

All of these biophilic design features are perceived through a range of human senses, including sight, sound, touch, smell, taste, and movement. The visual sense is by far the most prevalent method in which humans experience and respond to the natural environment. When we encounter plants, animals, water, landscapes, and other natural elements, we experience a variety of physical, emotional, and cognitive responses.

Table 4. Possible Applications of biophilic urbanism (Source: SBEnrc Stakeholder Workshop, 2011)

1. Green (Vegetated) Roofs	11. Parks (connected by wildlife corridors)
2. Green (Vegetated) Walls (incorporating vines and trellis)	12. Urban Constructed Wetland (incorporating stormwater and wastewater capture and treatments)
3. Daylighting streams (referring to uncovering waterways contained in pipes, under roads or under landscape)	13. Shopping Centre Greening (as communal public spaces, and taking advantage of increased sales in greened commercial districts)
4. Creating wildlife corridors along infrastructure corridors based on tracked migration patterns such as roadways)	14. Running water (incorporating water capture and storage, and evaporating cooling)
5. Community information centers providing knowledge on local species and environment	15. Shade plantings (strategic planting to reduce internal building temperatures in summer)
6. Creating storm/sea buffer zones with vegetation	16. Swales (rather than traditional stormwater conducts)
7. Vegetable gardens, and community gardens	17. The use of natural light and ventilation in buildings.
8. Greening verging strips, including with food production	18. Green sidewalks (rather than pavement)
9. Street trees and canopies over streets, including for food production	19. Connectivity within green species and greenways
10. Internal plants and vegetation for buildings (incorporating aquaponics)	

Kellert and Calabrese (2015) (Stephen R Kellert, Elizabeth Calabrese, 2015) proposed essential criteria for good biophilic design practice, which include (Downtown, 2017):

1. Biophilic design necessitates recurrent and persistent contact with nature;
2. Biophilic design focuses on human adaptations to the natural world that have enhanced people's health, fitness, and well-being across evolutionary time;
3. Biophilic design fosters emotional attachment to specific contexts and places;

4. Biophilic design fosters positive interactions between people and nature that foster an expanded sense of relationship and responsibility for the human and natural communities; and
5. Biophilic design fosters mutually reinforcing, interconnected, and integrated architectural solutions.

CHAPTER 3

MATERIALS AND METHODS

3.1 Background

Throughout the years, as cities develop, we have become disconnected from Nature. A growing body of evidence suggests that we need to change how we approach city design by implementing biophilic design features to counteract these effects. Biophilic urbanism can be applied across a variety of scales, achieving a city-wide impact. The study aims to explore innovative ways to deliver biophilic outcomes by incorporating Nature into Tirana's Neighborhoods design and planning (*Figure 5*).

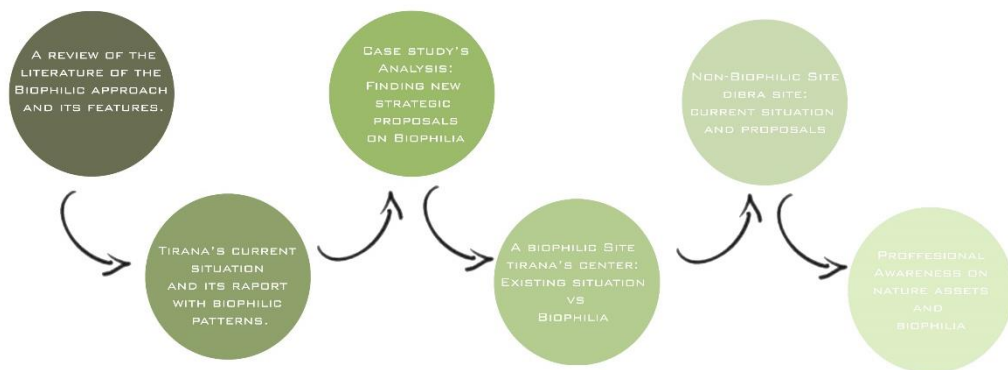


Figure 5. Research Approach (Courtesy of the author)

The quantitative and qualitative methods are used to distinguish among the standards and patterns in the selected neighborhoods. Analyses of different variables might give insight into certain planning aspects in the chosen sites. The thesis combines narrative techniques with geospatial mapping and other modeling and methods to understand how biophilic solutions will occur as a new sustainable framework.

The study's introduction includes a comprehensive literature review to score both the ecology, the social and economic performance of green spaces. Since the research focuses on nature-urban relationships, a Site Selection Criteria took place.

Two chosen sites are within the first ring of Tirana's center, connected through St. Dibra, creating a potential for new matrixes of urban Nature. They differ on scale and biophilic features existence, practically a biophilic site and a non biophilic site. Despite being located near each other, they differ in natural assets, the number of public greenery and land use. At the same time, it is essential to go through attribute analysis of the existing situation in the chosen sites to explore the application of biophilic design principles comprehending when the principles are the most suitable or challenged in three particular scales: occupant, street, community scale (*Table 5, 6*).

Table 5. Biophilic Elements Analyses

Scales of Biophilic Concept	Forms of Biophilic Concept Based on their scale
Building Scale	Green Roof, Green Wall, Shade Trees
Street Scale	Pocket Parks, Street Integrated Vegetations
Building City Scale	Green Rings, Biodiversity Corridors, Community Gardens, City Farms, Wetlands.

Models and surveys were also developed within this multi-phase methodology. The use of models will assist in simple results generating the physical touch between building, land, vegetation. The questionnaires were used to obtain the professionals' opinions regarding the importance of biophilic planning and how willing they are to access this biophilic pattern in Tirana. The data gathered based on user experience were set up based on a 5point Likert level (1=very good, 2=good, 3=poor).

Table 6. Experience and attributes of biophilic design

Direct Experience of Nature	Indirect Experience of Nature	Experience of Space and Place
Light	Image of Nature	Prospect and Refuge
Air	Natural Colors	Organized Complexity
Water	Stimulating Natural Light and Air	Integration of parts to wholes

Plants	Naturalistic Shapes and Forms	Transitional space
Animals	Evoking Nature	Mobility and wayfinding
Weather	Information Richness	Cultural and Ecological attachment to place
Natural Landscape and Ecosystems	Age, Change, Time	
Fire	Natural Geometries	

Future Analyses

Face to face Interviews and Cognitive maps (storing experience information that can be spatially referenced) can be used in further studies to understand better people and their understanding of Biophilia and its patterns. Due to the lack of time, future direction can be addressed using Envi Met in the data collection and analyses thermal comfort fostered by biophilic strategy. This qualitative investigation gathered a particular X number of people of different age and interdisciplinary fields analyses two types of situations:

- 1 Their relationship or attitude in a space designed with biophilic principles.
- 2 Their behaviors when their urban setting (their neighborhood) lacked biophilic solutions.

The participant observations play an essential role in emerging the perception of the nature-build space-people relationship. A study tour (City walks into Tirana's Neighborhoods) can be proposed to face the problems and understand the optimization needed using Biophilic techniques. The outcomes of successes, failures, and anticipated must be evaluated considering the EO data collection, decoding urban needs toward green infrastructure. The idea behind using earth data is to stimulate an urban-vegetation-atmosphere simulation to examine the effect of greenery on human-urban activity, as well as exploring their impact on environment comfort.

3.2 Phase 1

Phase 1: Site Selection and Tirana's Context (*Figure 6*)

The current sites used for the study are not Biophilic Sites in the traditional sense, but they do have features that are closely connected to the suggested Biophilic patterns.

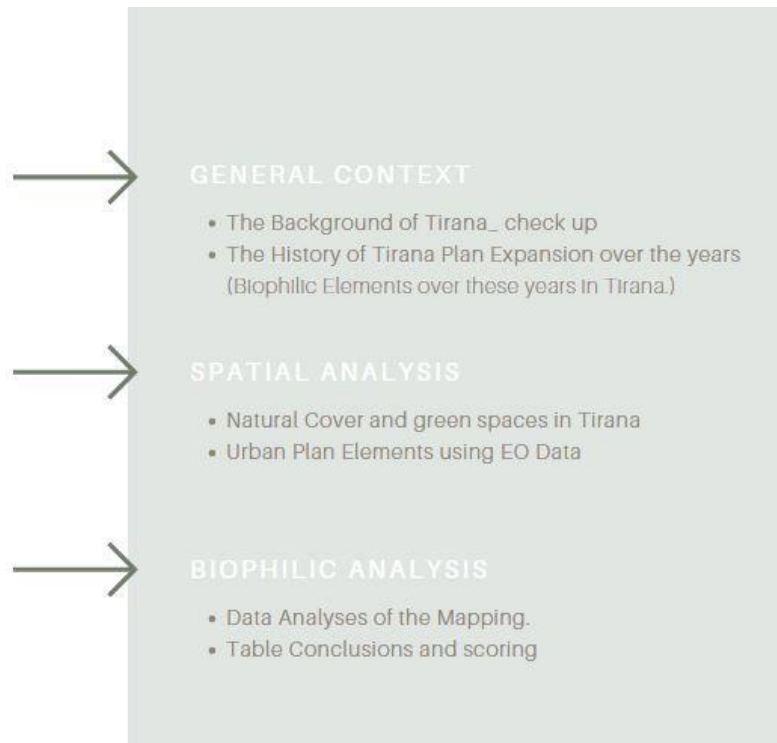


Figure 6. Tirana' Context Research Approach (Courtesy of the author)

The first location (Tirana's Center) chosen for research does not compass all of the Biophilic Patterns, but rather an interconnected network of specific ones that define the character of this specific area. Despite that the existing intensity of nature assets and biophilic patterns classify it into a Biophilic Site.

The second, located near the first one, a block (neighborhood) scale has weak biophilic intensity, and the existing one is under the private context. This site is taken into consideration as a non biophilic site.

In order to provide preliminary data and information about the demographic, economic, social, cultural and historic context of the study site and population, a site investigation using archival & online researches was applied.

Graphical Mapping were presented to record physical attributes, conditions and interactions of biophilic features with users of the community.

In both cases, only the domain's practical features are examined. Variables such as occupant health benefits need a particular degree of survey and comprehensive analysis, which could not be completed in the allotted time period.

1. Site Investigation & Biophilic design Description
2. City Scale: EO Data Analysis of Urban Plan Elements

3.3 Phase 2

Phase 2: Introduction of the Tirana's Center and Dibra Site as case study.

EO Data and Mapping Layering were used to provide fundamental data and context to the study. This phase introduced fundamental information for understanding key features of both Sites (Urban Layering).

A more thorough study was done to collect data and information about biophilic concepts and patterns of the site. The sources reviewed were different workshops and other municipality community reports, as well as Photos and Google Earth observation of the spatial features. All materials collected were analyzed to extract information connected in any way with community health and wellbeing, environmental and biophilic aspects of the site. The results were presented in Chapter 5.

1. Urban Green Prints using EO
2. Implementing geo design framework to analyses different biophilic patterns in the chosen sites.
3. Evidence of the Biophilic Patterns in Tirana's Center_ A case study of Tirana's Center Green Belt
4. Evidence of the Biophilic Patterns in Tirana's Neighborhood_ A case study of St. Dibra.

3.4 Phase 3

Phase 3: Biophilic Scoring Hexagon Method Analyses & Awareness Confrontation with professionals (architects, urban planner).

Hexagon Tessellation Methodology has made unique contribution to provide data about whether or not people and Tirana; residents have access to Biophilia and its pattern. Biophilic Opportunity maps were created to analyze Dibra Site green layers.

Biophilic design features survey was conducted to provide general information about the biophilic condition near the participants, the degree of their environmental awareness, as well the daily use of natural assets.

- Biophilic Opportunity Map
 - Online Suvey Confrontation.
 - Observation.
1. Where people tent to rest/gather.
 2. How are these places connected and how people tent to move between them?

Future Analyses and Surveys:

1. Face to face Inteviews/Surveys
2. Cognitative Maps (mapping research on how inhabitants experience their way home)

CHAPTER 4

CASE STUDY ANALYSES

Mainstreaming Biophilic Design: Research, Design, Practice

This chapter will give an explanation on understanding how the principles of biophilic architecture has been used in these particular case study and their role in the space quality (*Table 7*). Studying the user experience in this biophilic designed spaces.

Table 7. Case Study Tables (Courtesy of the author)

1_Case Study X	Greenacre Park
1. Location	New York, USA
2. Project Type	Public
3. Project Scale	Community Scale
4. Keywords	Waterfall, Pocket Garden
5. Key Biophilic	Natural Connection, Presence of Water
6. Strategies	Urban Oasis
7. Specific Benefits	Health, relax, Recharge, Refuge

4.1 Foreward/Criteria for Case Study Analyses

The selected case studies will demonstrate the application of research and design methodologies to the benefits of nature in cities, followed by a discussion of limitations and suggested future actions.

They employ biophilic design, while the third takes a broader socio-ecological view of nature's advantages.

To assist the revelation of a multiscale design study in Tirana's case and related knowledge transfer from research to practice and policy in Tirana's case, biophilic research findings are illustrated in the following sections, which describe research studies performed in other places and focus on biophilic application at various scales.

The significance of biophilic design principles for individuals and the living environment is underlined in implications for innovation and community resilience at various scales.

Each Case Study includes:

1. Project Overview
2. Detailed Explanation of patterns that are present
3. Bringing critical analyses to a close
4. Images and Illustrations to back up the claims.

4.2 City Scale: London Green Grid: A biophilic city scale initiative.

Cities with green-blue urban networks are more sustainable, resilient, and climate-proof. They emphasize biophilic design patterns and encourage nature's interaction with the urban setting.

Project Summary

The East London Green Grid ideas contain a concept for veining East London with green-blue buildings (*Table 8*). The goal of this strategy is to develop natural urban systems that support and allow ongoing development. It is intended that an urban environment be realized that connects places where people live and work, public transportation hubs, the Green Belt around London, and the Thames.

These green-blue structures expressly seek to buffer water, improve air quality, and reduce air temperature. Possibilities for building green structures abound along the Thames's tributaries, where industrial complexes are sprouting up. Another strategy is to link as many urban vegetation areas as feasible through acquisition or zoning modifications. The East London Green Grid Master Plan outlines 300 projects that will be implemented in three phases. The first 300 projects will be finished over the next few years.

The proposals for East London demonstrate that an urban conglomerate like London believes that a reasonably finely meshed green (and cool) urban infrastructure is essential for realizing a sustainable metropolis. Green buildings have been closely connected to the goal of a healthy urban environment. The city is certain that the green-blue grids will serve as healthy gateways for future economic and other growth. The proposal asks for a 250-million-pound investment (Greeter London Authority,2006).

A sustainability strategy has been released, with five main aims in mind: combating climate change, reducing waste, improving biodiversity, raising public awareness, and improving quality of life (London Green Grid, 2021).

Table 8. Harrow Green Grid (Courtesy of the author)

1_Case Study X		Harrow Green Grid
1.	Location	London
2.	Project Type	Public
3.	Project Scale	City Scale
4.	Keywords	Green Corridors and Connections, All London Grid
5.	Key Biophilic	Green Infrastructure across Harrow
6.	Strategies	Urban Green Network & Open Spaces
7.	Specific Benefits	Increase access to open spaces, Healthy living, Sustainable Green Skills

Area Description: Green Space Network and Deficiencies

A matrix of interconnected multi-purpose open areas with strong links to people's homes and workplaces, public transportation, the green belt, and the Thames. Green infrastructure resources abound in Harrow. It features extensive stretches of accessible green belt along its northern border (*Figure 7***Error! Reference source not found.**). Despite the fact that suburban street configurations might be confusing, and

many green places are blocked from view (Harrow Green Grid: All London Green Grid, 2021).

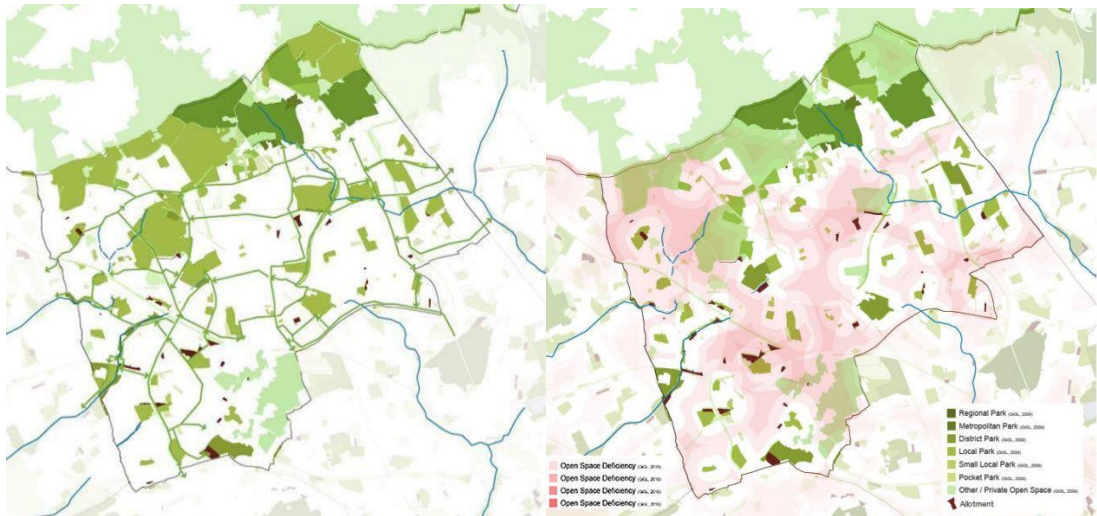


Figure 7. Green Network and Deficiencies (Source: Greater London Authority, 2012)

There aren't many connecting barriers or pathways. Locals may be unaware of, or unaware of how to reach, open space, unless they have a car. Despite the Borough's abundance of green open spaces, several areas have been recognized as lacking in public parks/open space. This is related, in particular, to limited access to private land, as well as separation by highways and railways.

Strategic Opportunity/Connections

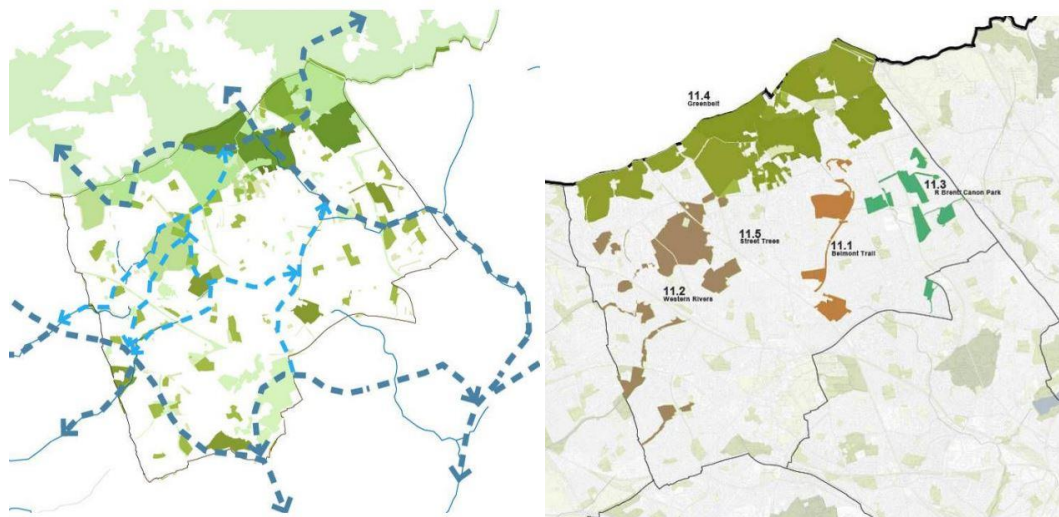


Figure 8. Biophilic Strategic Connections and Emerging Solution (Source: Greater London Authority, 2012)

1. 11.1 BELMONT TRAIL Completion of a pedestrian and bike route connecting central Harrow to the Greenbelt (*Figure 8*).
2. 11.2 WESTERN RIVERS Through increasing linkages to the Greenbelt and local destinations, rivers may be managed to promote biodiversity and encourage more recreational (*Figure 9*).
3. 11.3 RIVER BRENT/CANON PARK Work on biodiversity and a route network along Edgware Brook and nearby open areas.
4. 11.4 GREENBELT Plans and programs for biodiversity management.
5. 11.5 TREE PLANTING A comprehensive city planting initiative with both aesthetic and environmental benefit.

Biophilic Objectives of Harrow Green Grid Framework Strategy:



Figure 9. Biophilic Objectives (Source: Greater London Authority,2012)

4.3 Community Scale

Project Overview

Greenacre Park is a 6,000-square-foot paradise tucked among midtown Manhattan's towering buildings (*Table 9*). A 25-foot-tall waterfall inside the park cools down and muffles the sounds of the surrounding traffic, offering space for quiet—a rarity in the city center. The Park is divided into three separate levels, giving visitors a variety of environmental options. The spatial arrangement and outstanding use of biophilic design concepts foster a sense of calmness in this popular park, even during peak usage seasons.

Table 9. Greenacre Park (Courtesy of the author)

1_Case Study X	Greenacre Park
1. Location	New York, USA
2. Project Type	Public
3. Project Scale	Community Scale
4. Keywords	Waterfall, Pocket Garden
5. Key Biophilic	Natural Connection, Presence of Water
6. Strategies	Urban Oasis
7. Specific Benefits	Health, relax, Recharge, Refuge

Biophilic Patterns Analyses

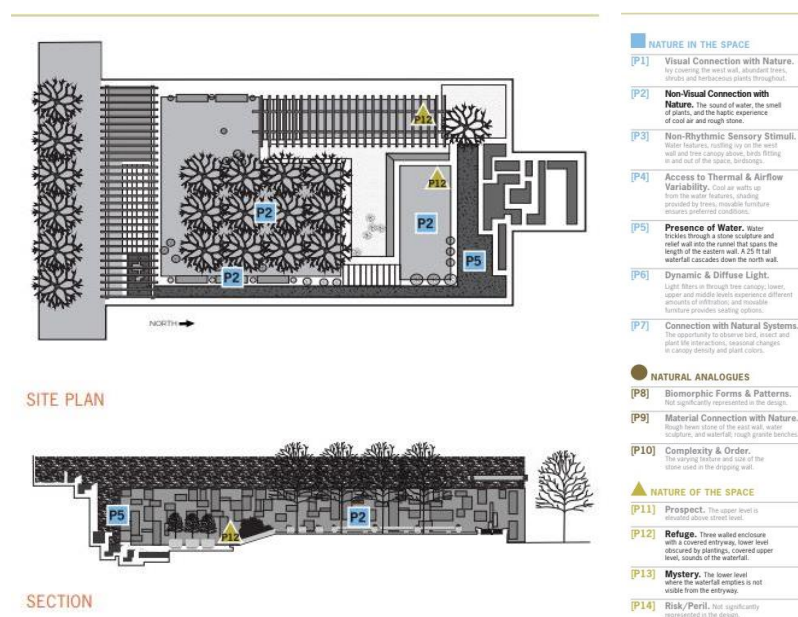


Figure 10. Biophilic Pattern, Greenacre Park (Source: Terrapin Bright Green)

Site Design: This plan shows how Sasaki utilized plants, water, and trellises to divide the garden into three different sections. A huge T-shaped flower arrangements acts as a physical separator. Water defines the lower level at the park's northern end, and a concrete pergola separates the elevated platform on the west wall.

Section: This part emphasizes the waterfall's multi-tiered construction, the geometric designs of the relief sculpture wall, and the elevation difference between the street, ground level, and lower level (*Figure 10*).

4.4 Biophilic City Indicators

There are some measurable indicators to which one can test if a city is biophilic, and these were used to assess cities which have joined his research project, according to Timothy Beatley 2010.

1. The percentage of the population that lives within 100 meters of a park or green space, such as Central Park in New York City, where 27 percent is green space, offering natural assets within 100 meters for all inhabitants (*Figure 11.a*)



Figure 11. a) Central Park, NYC b) Keskuspuisto Park, Helsinki, Finland

(Source: Google Image)

2. The presence of a linked, integrated green network, as well as green urbanism. Keskuspuisto Park in Helsinki, Finland, is an example of a greenspace network that provides an uninterrupted green wedge from the city's outskirts to its heart. (*Figure 11.b*)

- Coverage of urban forests as a percentage of total land area. Sao Paulo, Brazil, has thick forest covering 20% of its jurisdiction (*Figure 12.a*).



Figure 12. a) San Paulo, Brazil b) Anchorage, Alaska (Source:Google Image))

- Walking Trails inside each city. Anchorage, Alaska contains 250 miles of trails, which equates to around one mile per 1000 people. (*Figure 12.b*).
- Quantity of urban agriculture and garden plots; access to community garden places Seattle's P-Patch community program, which aims to have one community garden for every 25000 inhabitants. (*Figure 13.a*).



Figure 13. a) Seattle's P-Patch b) Chicago's Green Roofs (Souce:Google Image)

- Green Roofs, Green Walks, and Trees_ Chicago boasts one green rooftop or other urban green feature for every 100 people, with around 500 green rooftops, making it the leader in the number of green installations in the United States. (*Figure 13.b*).

CHAPTER 5

THESIS DEVELOPMENT

5.1 The current situation: A case study of Tirana

This chapter will describe and examine the methodology's execution, as well as the outcomes and findings. It investigates the lines that reflect the conflicts that exist between human settlements and the natural environment. The thesis' possibilities and restrictions are identified by analyzing the circumstances around the chosen place.

By summarizing the biophilic levels of the city and block, this part seeks to convey the site research of Tirana and Tirana's neighborhood for an environmentally sustainable model for residential land development.

5.1.1. The context and History of Tirana

Tirana, Albania's capital and largest city (*Figure 14*), is surrounded on all sides by mountains and hills, with Dajti to the east and a small valley to the northwest facing the Adriatic Sea. It is the most important city in Albania from a different perspective, including economics, geographical dimensions, population numbers, and certainly as a city with the most extensive and dense urban area.

TIRANA_AS A CASE STUDY

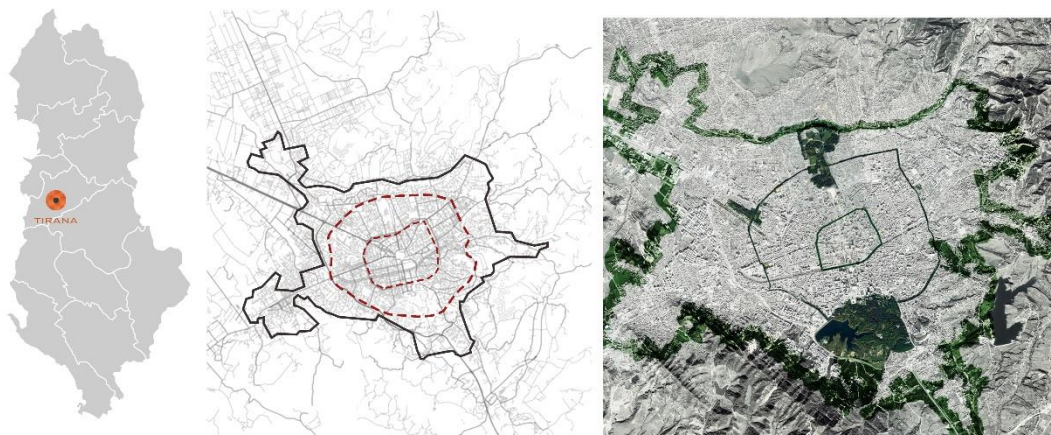


Figure 14. Tirana's Location (Courtesy of the author)

It is a paradoxically complicated and quickly changing metropolis. Its vibrant, chaotic urban fabric recalls its remarkable past. Albania underwent a major transformation in the 1990s after experiencing one of the toughest authoritarian regimes of the Cold War era. A shift to pluralism, democracy, and the market economy has occurred over the previous 30 years, involving huge urban migration and unrestrained capitalism (Cergy, 2020). As a result, Tirana's population has increased, and it continues to attract a continuous flow of people from across Albania. It is home to a third of the country's population.

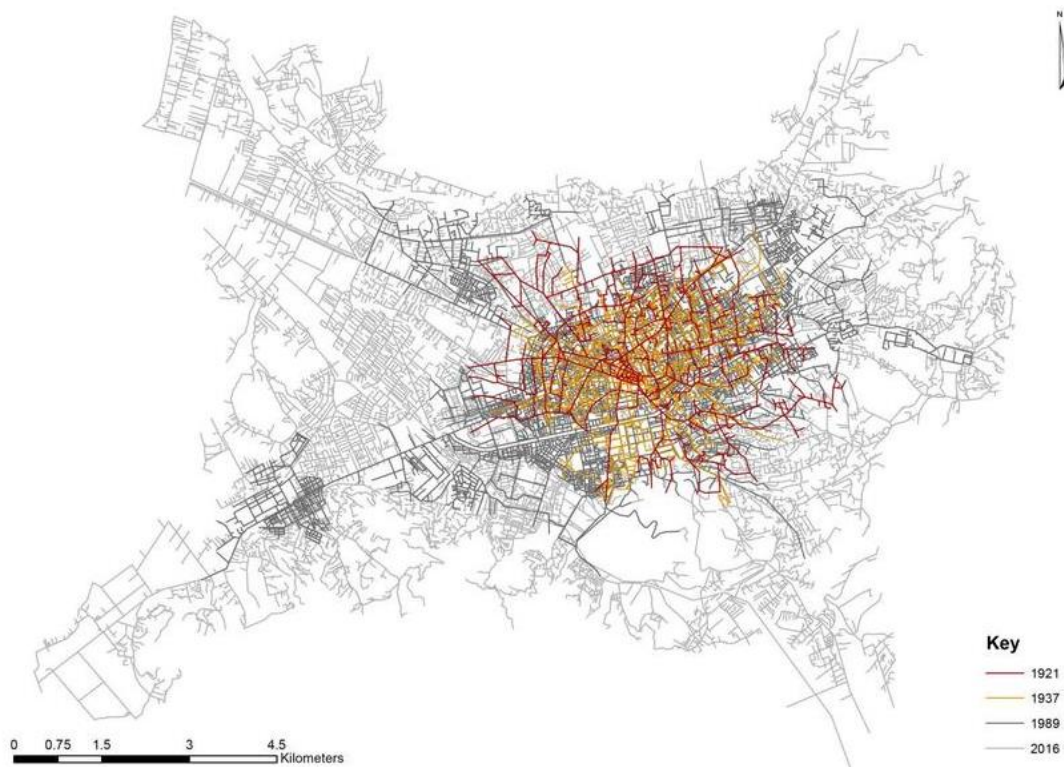


Figure 15. Overlaid Growth of Tirana (Axial Map_ Source: Blerta Dino Space Syntax Laboratory, The Bartlett School of Architecture)

In its ever-expanding metropolitan territory, Tirana is characterized by severe densification of existing districts as well as the emergence of self-built informal suburban patterns. Due to its complete expansion (*Figure 15*) and the tremendous alteration that urban space has experienced as a consequence of people migrating to Tirana from the surrounding rural areas, but most significantly from Albania, it is frequently referred to be a metropolis (Shameti, 2019).

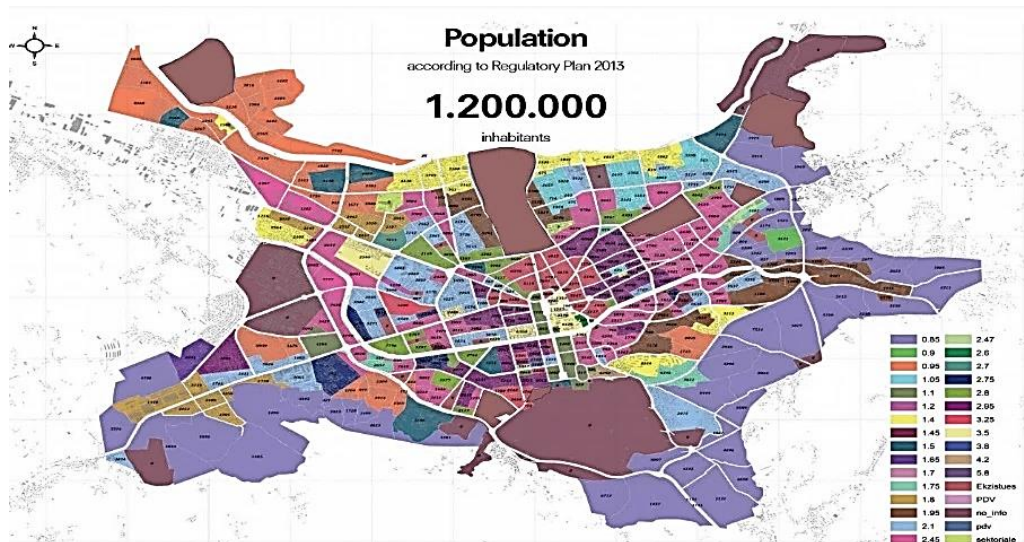


Figure 16. Tirana's Population acc. to Regulatory Plan 2013

Tirana Municipality has over 850 000 residents, with a population growth rate of around 2500 people each year (*Figure 16*). This pace of increase (*Figure 17*) indicates that the country is on track to quadruple its population in the next two decades, highlighting the need for a new sustainable framework based on Biophilic Principles.



Figure 17. Tirana's Population Density acc. to Regulatory Plan 2013

For more over two decades, there has been a boom of informal structures, primarily on the outskirts, with no formal urban services or infrastructure. The fast process of urban changes has had an impact on the spatial layout of the city, which has

reflected as a chaotic pattern formed by the many layers of development eras throughout most of the territorial area.

The city center is open and well-organized, with broad boulevards, great squares and buildings, and beautiful parks and green areas. The residential neighborhoods are quite different. They are composed mainly of 4-10 level postwar apartment buildings and informal (and often illegal) infill extensions, with small (sometimes unsurfaced) streets, informal vehicle parking spaces, and very little additional outdoor space.

Tirana's population has more than doubled in the previous 30 years, and this growth was entirely unplanned until lately. Excessive automobile ownership (worsened by their position in a country where cars were formerly the unique property of the communist elite) has resulted in excessive traffic, car-choked neighborhoods and streets, and significant levels of air pollution. The combination of these ongoing problems and acute shocks may look intimidating, yet in the midst of these hard conditions, chances for rethinking the future exist - a crisis as an opportunity.

Despite these, there are 11 distinct functional categories of public spaces: Memorials; Markets; Streets; Green and Playgrounds; Community open spaces; Greenways and parkways; Atriums/indoor markets; Found spaces/everyday spaces; Waterfronts Furthermore, many additional sorts of hierarchy-based tasks offer organizing manage space and green types. It investigates the problems and trends of the city's recent territorial development, as well as the potentialities for implementing certain forms of sustainable urban development that may be acceptable and feasible in the local context, in relation to the Albanian context in general and the Tirana metropolitan area in particular.

Therefore, it has been given a new strategy to attaining urban sustainability, claiming that efforts to this end are linked not just to its urban design (*Figure 18*); (*Figure 19*). Instead, viewing the city as a process provides a much better chance of achieving the objective of a sustainable city.



Figure 18. Territorial Division a) Urban b) Peri Urban (Source: Anisa Mance, Director of Urban Planning Municipality of Tirana, 2019)



Figure 19. Territorial Division c) Peri Urban + Metrobosko d) Rural (Source: Anisa Mance, Director of Urban Planning Municipality of Tirana, 2019)

5.1.2. Urban Plan Elements (EO Data Observation)

The existing urban plan illustrates three main layers that can be applied in particular maps, identifying City urban development as well as opening up opportunities. Taking into account Tirana's ever-changing character and the variety of ideas under consideration (*Table 10*), it is critical to become acquainted with the city's fabric as well as its assets in order to have a greater influence on placemaking, urban growth and land use changes in Tirana.

Following the release of land and commercial buildings to people in 1992, Tirana saw a development boom. Many cars and trucks were imported, producing significant traffic and space congestion along roads and in downtown areas.

Tirana’s population, including suburban zones, more than quadrupled from 225,000 at the end of the communist era to an estimated 450,000 five years later, rising to more than 600,000 in mid-1999 (Felstehausen, 1999).

Tirana’s urban periphery as well as downtown districts became the center of intense development pressures. Squatters frequently occupy state-owned suburban land. Within the city, street frontage, parkways, and vacant lots are commonly claimed for stores and restaurants through temporary constructions that are eventually replaced with permanent structures. Land outside of the city but close to transit lines is the first to be inhabited because it is the most accessible to transportation and has the best chance of being linked to water and electricity.

Table 10. Tirana’s Development since 1991 (Source: ALUIZNI, 2015; Aliaj 2003; INSTAT,2001)

Period	History	Build Environment
Pre-Socialist	Tirana become a city in 1992.	Italian architectural style influence.
I. 1921-1938	Albania’s urban population was small with just 5, 4% of the population living in urban areas.	Vernacular architecture.
II. 1939-1945	Forced migration towards urban areas increased for security reasons associated with WWII. 21.4% of population living in urban areas.	Italian style inspired architecture and planning mode.
Socialist Development	Soviet socialist dictatorship.	Soviet-influenced state planning.
III. 1946-1959	The ongoing increase in urban development achieved its peak in the early 1950s. During this period the national annual growth of urban population was 1.4%.	Soviet planning models and architectural typologies.

IV. 1960-1991	Urbanisation slow down, population growth dropped to - 0.1%.	The introduction of prefabricated building systems.
Post-Socialist Development	Unregulated illegal construction.From centralized to free market economy.	Informality.
V.Early post-socialist 1992-2007	Heavy migration toward urban areas with 65 % of it towards Tirana. Unregulated urban development, 520 000 illegally constructed dwelling.	Turbo-architecture, Turbo Urbanism, “Self made” cities.
VI. Post-transition period 2007-present	Albania on GIS platform, Resolution imagery. Consolidation of planning legislation and authorities.General improvement of infrastructure, public realm and facilities.	Semi regulated development.

Today, we are confronted with a contrast within Tirana's Transformation, the inner area, which is practically the heart of Tirana, and the outer Tirana, which includes all zones outside of the city's official boundary known as the Yellow Line, which is known for the former state-farm property on the outskirts.

URBANIZED LAYER

Along with the democratization that began in 1991, urbanization has advanced in Tirana, which has accommodated a significant rise in migrants from rural and mountainous areas (*Figure 20*). Such rapid urbanization has resulted in significant urban programs such as infrastructural shortages, notably in housing (*Figure 21*).

The city's population is expected to reach one million by 2025, due to continued urbanization (*Figure 22*). To keep pace with the growing urban population (*Figure 23*), urban growth in the transportation, water/sewerage, and solid waste management sectors, in particular, is critical (JICA, 2009).

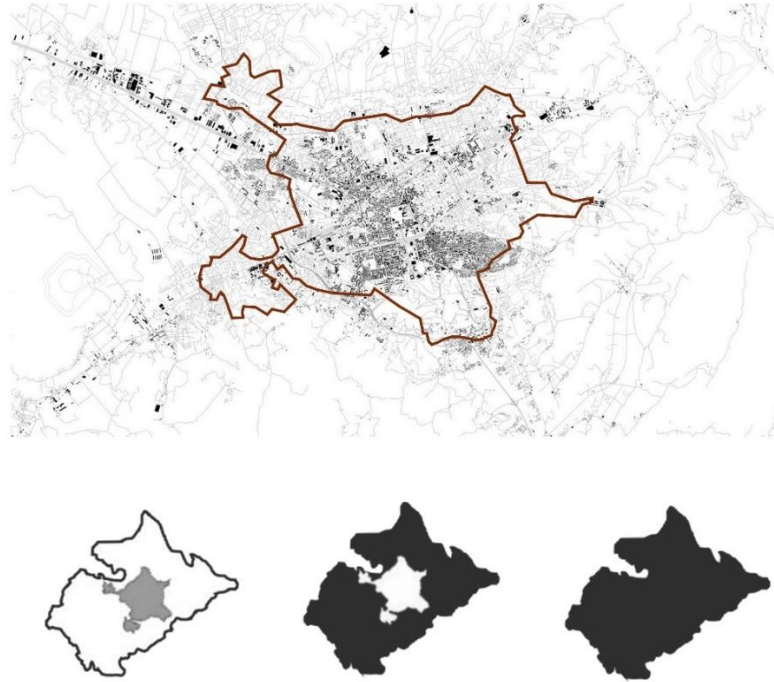


Figure 20. Tirana's Growth

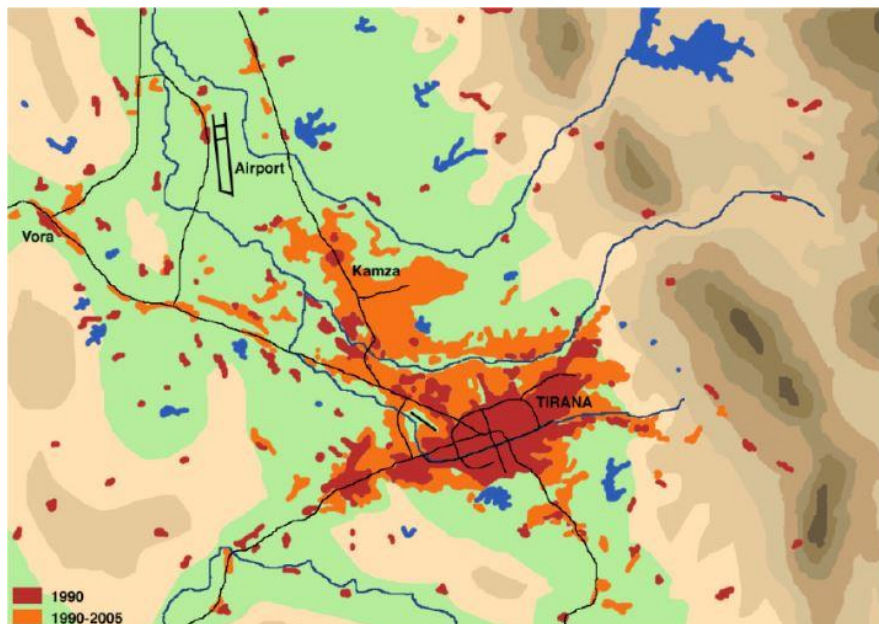


Figure 21. Tirana's Urban Expansion: in post 1990 periods (Source: Co Plan)

Tirana has seen a population increase as a result of rural-urban migration after the end of communism (Pojani, 2010). A dual city is produced as a result of this procedure. In the inner city, new high-rise residential complexes (10-12 story) were erected in close proximity to existing structures.

NATURAL LAYER-generally identifies the site's natural areas, such as forest land, meadows, wetlands, farms, and unique characteristics (*Figure 24*) (labyrinth, wildflower hill and rock garden, the archaeological site, and water bodies such as ponds, lakes, streams, and waterfalls).

Tirana is classified as an irregular and sporadic settlement. Under free and open access circumstances, and in the lack of public control, green spaces and natural areas have vanished, with the majority appropriated privately for individual gain.

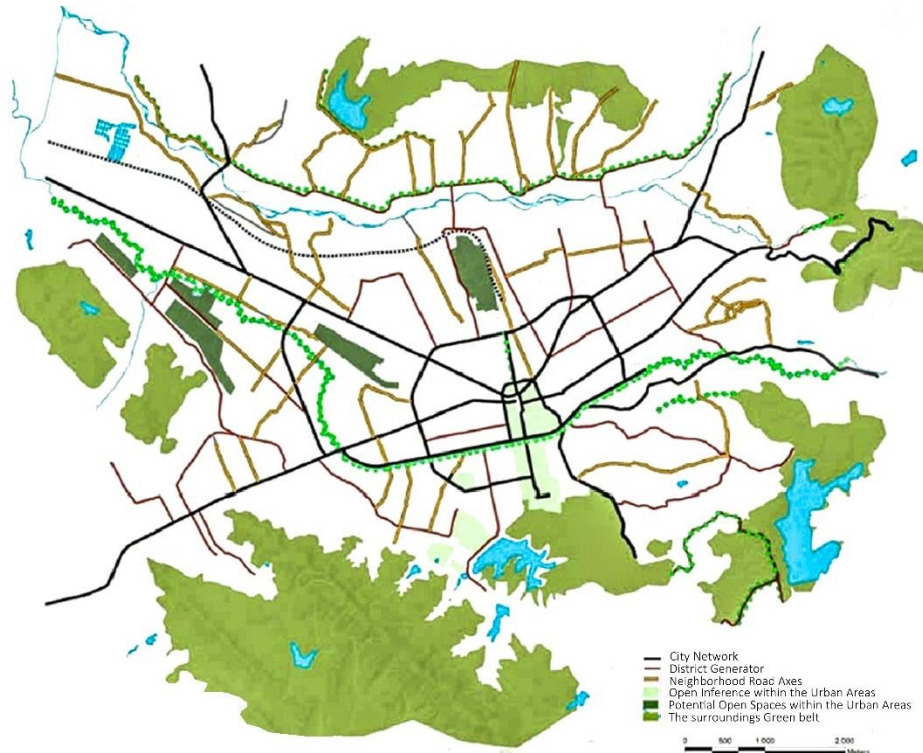


Figure 24. Natural elements insertion and generators of Tirana City (Source: Hakan Arslan and Vjosa Shehu)

Aside from their productivity and aesthetic merits, there are several reasons to preserve agricultural and green landscapes. Tirana has significant drainage, waste water discharge, and rubbish disposal issues, as well as a shortage of land for school grounds, parks and buffers. Previously established systems for agricultural land drainage and irrigation have been disrupted by informal land divisions and uneven parcel layouts.

Tirana River serves as the old city's current northern boundary. It is a natural greenway corridor. The Great Park, Tirana's major city park, was established in 1959–

60 and had 265 hectares of urban land, 45 of which are covered by an artificial lake. The Park is like a green island amid a sea of brown. Dajti Mountain National Park is the greatest example of a protected natural region near a big metropolis in the country.

In order to have a sustainable civilization and future growth, man-made and natural ecological elements must coexist. Tirana has a significant quantity of this stratum connected with a specific purpose and specialized usage, such as the Sunken Garden in the center. It is essential to highlight the number of natural assets that serve in the family gardens and are of special benefit to them and their family.

CIRCULATION LAYER- covers streets, driveways, and on and off-street parking; pedestrian networks include pathways, trails, bridle paths, sidewalks, and plazas (25).

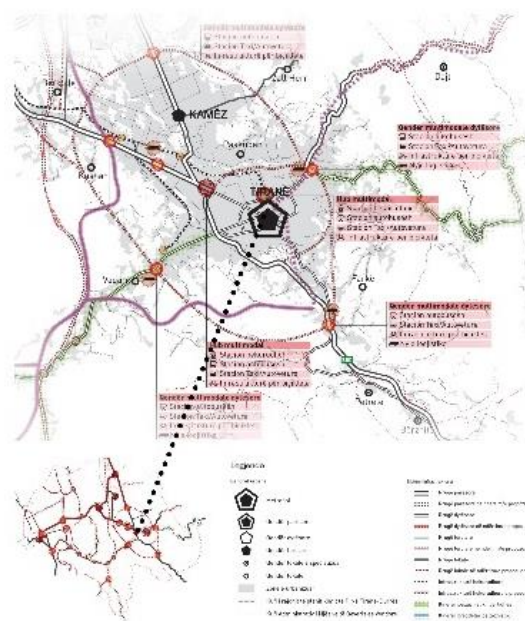


Figure 25. Urban Development (Source: AKPT, GIZ Albania 2020)

The modern globalization trend has raised the demand for movement substantially. Due to urban population expansion and urbanization, the significance of transportation engineering in daily life has grown significantly, as have the problems associated with it (Erion Luga; Aksel Seitllari, 2016).



Figure 26. Transportation Plan in Tirana Metropolitan Area (Source: Jica Study Team)

Tirana has a key transportation position, making it a major linking point of Southern Europe to the Black Sea, which is strengthened by the new European Highway 8. Furthermore, the existing Tirana-Durres urban corridor, which connects the capital directly to the port city, boosts traffic flow owing to the vitality it brings (Figure 26).

The northern part of Albania, the International Airport of Tirana (IAT), and the Arber Road (under construction) connecting Tirana and Skopje significantly enhance traffic flow, knowing that the whole flux is sustained by the capital's middle ring. Such a circumstance necessitates strategic short-, medium-, and long-term analyses of current transportation problems.

The bicycle lanes are frequently filled by unlawful stops or parking of private cars, even if they are being developed to some extent. The research seeks to improve the safety of this mode of transportation users by the extension of bicycle lines and an overall reassessment of non-motorized user demands (INSTAT, 2014).

Bus transit is the primary method of public transportation in Tirana (Figure 27), and it is one of the major elements influencing traffic congestion. The city bus system

consists of 10 lines, which are mostly arranged on a radial system from the suburbs to the city center, as well as through center lines (43,000 people per day) and circular lines along the Middle Ring (Municipality, 2009).

Furthermore, the lack of a bus terminal in Tirana has fostered the development and random placement of bus stations, mostly in the south, north, and west, as well as van stations, individual bus stations, and foreign bus stations with no bathrooms, waiting rooms, or ticket booths.

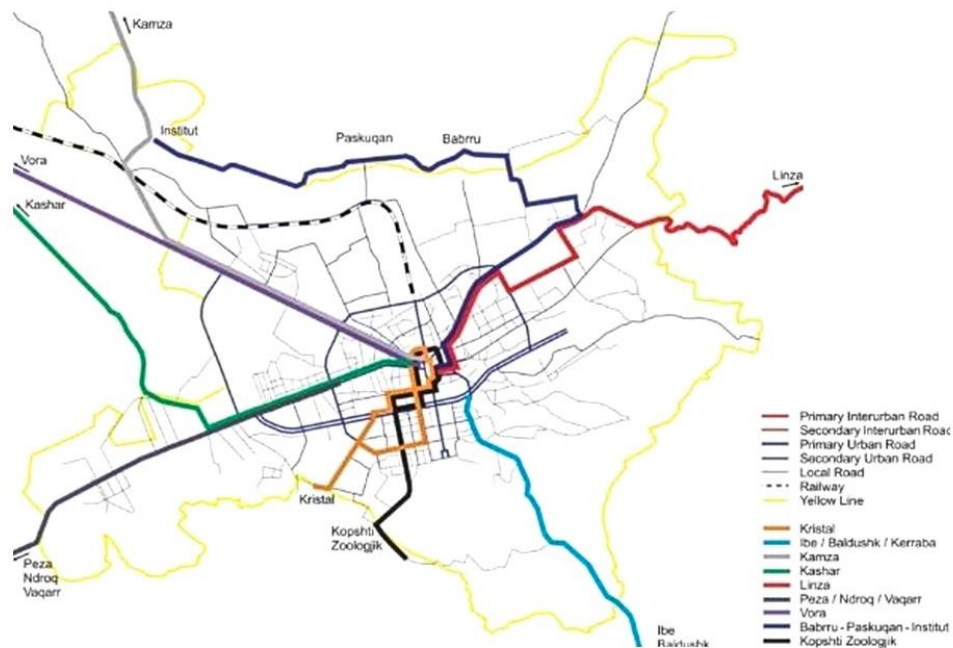


Figure 27. Transportation Network (Source: JICA Study Team)

5.1.3. Spatial Coverage, Nature Assets of Tirana/ Biophilic Layers/Urban Green Prints

Tirana, as previously said, is recognized for its enormous land areas and for differentiating other factors. Tirana is divided into three sections: inner Tirana, outside Tirana, and the entire Tirana.

Due to the extreme legacy of unregulated and informal settlements, Tirana's outskirts have insufficient infrastructure and public services. The significance of tackling this issue has grown as a result of the many inner Tirana impacts.

This area can be categorized as heterogeneous. The built form and land uses varies hugely within the blocks. The ground floor of the buildings over time has often lost its residential function in order to gain new functions; mainly shops, cafés and services.

Another feature of this region is that additional extensions were erected on a significant number of buildings, from the ground level to the top floor, affecting not just the buildings footprint but also allowing for various amounts of two- and three-dimensional alterations. For instance, one building that formerly had just one access point or link to the street now has four or five. This also resulted in the construction of additional alleys, which were typically little more than 5 to 7 meters long, to allow the new functionality, which made the building itself accessible from more than one edge of the facade.



Figure 28. Lack of Public Green (Source: Mark Spaan)

Tirana still has significant population explosion over the last 28 years, and as a result, urbanization has progressed faster than the infrastructure required to sustain it. Tirana's population grew from 280.000 in 1989 to 1 million now.

The urban sprawl did not respect sustainable living standards, but rather created a false philosophy in which housing and business construction were the only things

that mattered, while everything else, such as green or public spaces, was undermined, resulting in a notable uneven distribution of green spaces vs buildings (*Figure 28*).

According to studies, Tirana's ratio of open green space per 100,000 residents is just 4.6ha, which is a low figure. Furthermore, since 2013, two monitoring stations placed within Tirana's metropolitan area have indicated an extremely high level of air pollution. To make matters worse, a territorial revision in 2015 increased the Municipality of Tirana from 42 to 110 square kilometers overnight. Immediate and long-term intervention was required.

At a time when other nations are discussing barriers, Tirana is constructing a wall of trees to help oxygenate the city. The first strategic goal of Boeri's General Local Plan 2030 is to create a "Orbital Forest" of 2 million trees that would encircle Tirana and function as a green belt to prevent urban sprawl.

The day of Green City has not yet arrived!

There is a need for social and cultural transformation in which citizens engage through various initiatives. To preserve the fascinating vegetation and green network, as well as to prepare for more, it is critical to promote local private and civic involvement, as well as to intelligently choose and deploy smart technologies.

Tirana's development demands and urbanization put nature's functioning at risk. These changes, as well as earlier shocks, have had an impact on the vegetation and hydro characteristics, resulting in deterioration.

Overlapping other variables like Tirana's development, population growth and transportations with Biophilic Nature Layer, can produce mapping that show how the intensity of nature has change through the years as well as how accessible is the current situation of the natural assets using main roads and most particularly using public transportation, which is the main mean of transport in Tirana. The mapping observation shows that the expansions of Tirana's city is not proportional with the natural public progression. There is a lack of the public open spaces and the existing one aren't covered with biophilic features, or lack the dominance of it.

As the mapping results shows that the greenery and population are not maintaining with the same pace (*Figure 29*). The center has the major population, while the main natural assets is Skanderbeg Square and the belt created between it towards the Nene Tereza Square. Between the blocks the greenery misses, or it is

private within single houses perimeter. The major of the greenery is in the periphery, but it is not focus in the human experience and the access is lacking (*Figure 30*).



Figure 29. Raport of the current population density of Tirana over Biophilic Nature Assets (Courtesy of the author)

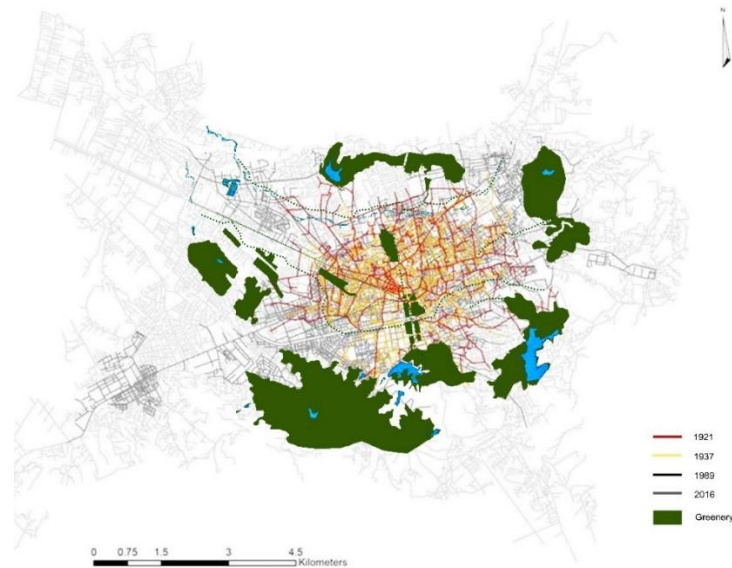


Figure 30. How accessible are green spaces? Raport Tirana’s Nature Heart and Expansion Growth Map (Courtesy of the author)

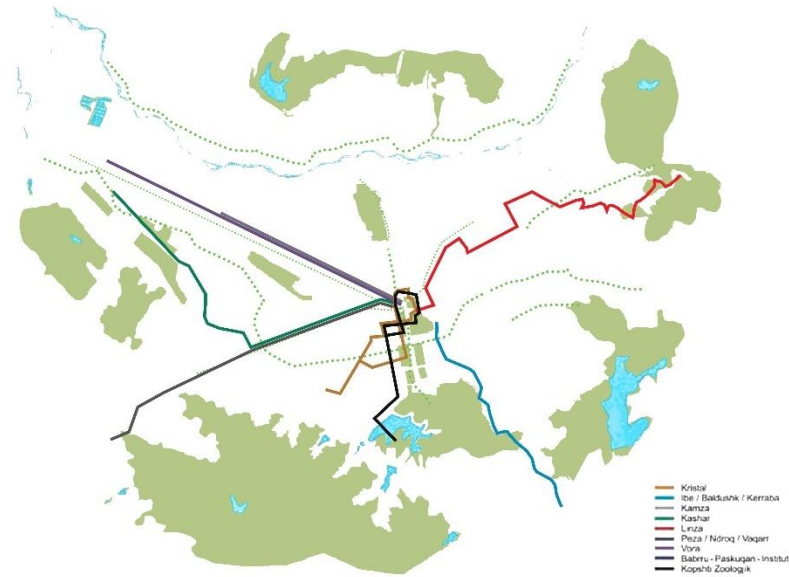


Figure 31. How accessible are green spaces? Raport Transport -Biophilia
Map (Courtesy of the author)

However, the distribution of the number of greenspaces is carried within the main green belt, located in the center of the city. While these systems of green patterns are strong resources for Tirana's quality, there is a lack of ability to provide similar habitats distributed fairly in overall Tirana. This main Biophilic site can't be accessed daily by everyone (Figure 31), and the expansion of Tirana toward the informal setting in the suburban areas, make it difficult for the residents to have a direct access to this central greenery asset. So, it is important to provide them with particular open green space nearby.

Tirana is in a position where its rapid development and sometimes questionable greenspace practices may endanger natural ecosystems. It is critical to establish new green spaces as a grid linking Tirana's core to its perimeter, where its ecosystems and open spaces may once again be considered to give downtown biophilia.

5.1.4. The Cyclic Transformation

Recent research has shown that urban nature (biophilic urbanism) provides numerous benefits, including reduced crime, increased psychological well-being, reduced stress, depression, and anxiety, increased productivity, improved healing from illness, increased immunity, increased attention recovery and cognitive abilities, and developmental benefits to children. (Reeve et al, 2011). As Timothy Beatley points

out, even tiny doses of nature may be beneficial, such as a window view of trees and parkland, pot plants in buildings, a brief walk in a park, or rooftop gardens. (Beatley, 2009) This is a significant discovery because incorporating nature into an existing constructed environment would need taking advantage of possibilities to vegetate smaller spaces while continually looking for methods to give 'more intense and extended exposure to nature' where possible.

- Each one of the urban variables affect the other, as they are part of the same chain of Tirana's Transformation
- The use of Biophilia as a sustainable paradigm of urban acupuncture affects all cities dimensions; streets, circulation, urban development, society health and wellbeing.
- Biophilic Urbanism is a needle that increase the importance of the existing green areas, foster the importance of new natural public and private spaces, as well as highlight the necessity of natural elements application as part of the urban network.

In this scenario, 'biophilic urbanism' is developing as a key design element for buildings and urban environments. Biophilic urbanism offers the ability to solve numerous challenges linked to climate change, rising urban populations, limiting resources, and humans' intrinsic desire for interaction with environment through the employment of a suite of natural design features.

Expectations of the Biophilic Paradigm Use:

1. A city of short distances, where one can walk or cycle to all daily needs to reduce dependence on private cars, and to help build viable communities;
2. To focus development along public transport routes, building up density in proximity to existing or new public transport to reduce car dependency;
3. To develop a diverse, decentralized, socially inclusive city with viable suburbs. Districts have work, shopping, schooling and leisure integrated into residential areas. Further, areas deliberately avoid segregation of demographic, socioeconomic or cultural groups;

It is critical to include biophilic urbanism as a component of sustainable development and lifestyle. Concepts such as sustainable transportation, passive solar design, renewable energy, and new economic models should be properly considered as elements that should be included in a biophilic city, with a focus on the systems and concepts that would underpin the development and operation of the city.

5.1.5. Biophilic Pattern of Tirana's Center Belt

Depending on the measuring or assessment technique, the concept of "Biophilic City and Urbanism" might be confusing and misleading. It is a new intense focus on how nature may be brought back into this densely populated urban environment in a more direct and effective manner. This is the driving force behind biophilic urbanism as it is defined and shown in dense cities and central zones.

Tirana's areas reflect unreadable urban pattern inappropriate use of buildings typologies, where the biophilic patterns lack and the existing one doesn't work effectively. There is a sense of "tension" in the utilization of space in some locations. The development project is a valuable urban planning tool in large cities for solving urban problems and providing new housing.



Figure 32. Tirana's Center (Courtesy of the author)

The main purpose is to provide the city with green spaces, parking, and the management of public places in residential blocks. This development has an unanticipated impact on urban spatial structure, such as a rapid increase in land prices, problematic growth of city suburbs, and so on. There is a need to examine the spatial effect of new development regions as well as to simulate urban spatial structure. Despite this, there is a strong green network link within the main square- Skanderbeg Square" to the newly created and prospective region of the Grand Park and Tirana Artificial Lake (*Figure 32*). This main corridor appears to unfold a range of biophilic designs spread in common spaces, vertical surfaces and rooftops, sections dedicated to coworking and products delivery, sports and leisure facilities, roof gardens, and pedestrian bridges (*Figure 33*). Due to the parks, squares, and tree canopy that serve as network links and nurture the local biodiversity, walkability becomes a priority, with an emphasis on 15 minutes walking distance across the area.

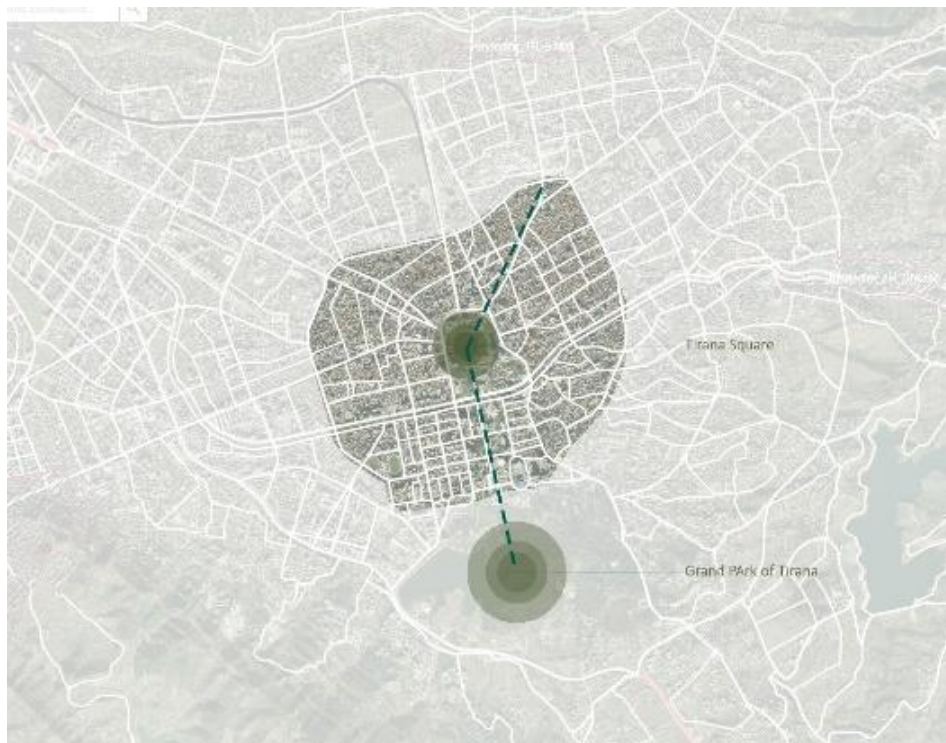


Figure 33. Tirana's Main Green Belt (Courtesy of the author)

This study categorizes biophilic elements based on the idea of biophilia practice in the Tirana instance, with a focus on the major Corridor of Tirana's core.

GREEN NETWORK (Error! Reference source not found.):

1. The Main Square (Skanderbeg Square)
2. Rinia Park
3. Reja
4. Promenade “Murat Toptani”
5. Park “Lulishtja 3 Vellezerit”
6. Artificial Lake of Tirana
7. The Grand Park
8. The tree canopy that lies in every street that connects the above places.

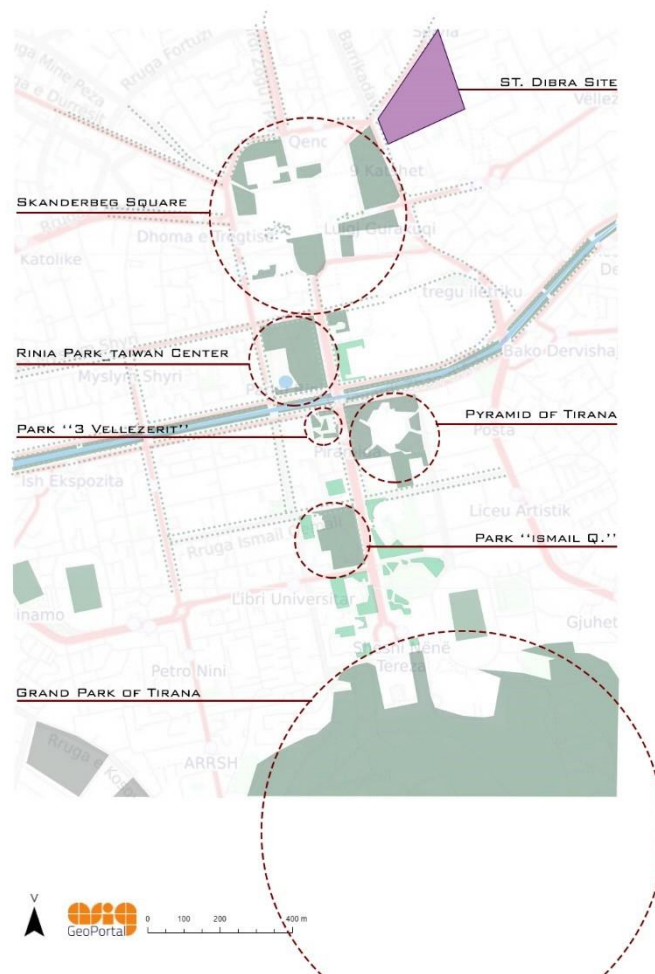


Figure 34.Green Network Chain (Courtesy of the author)

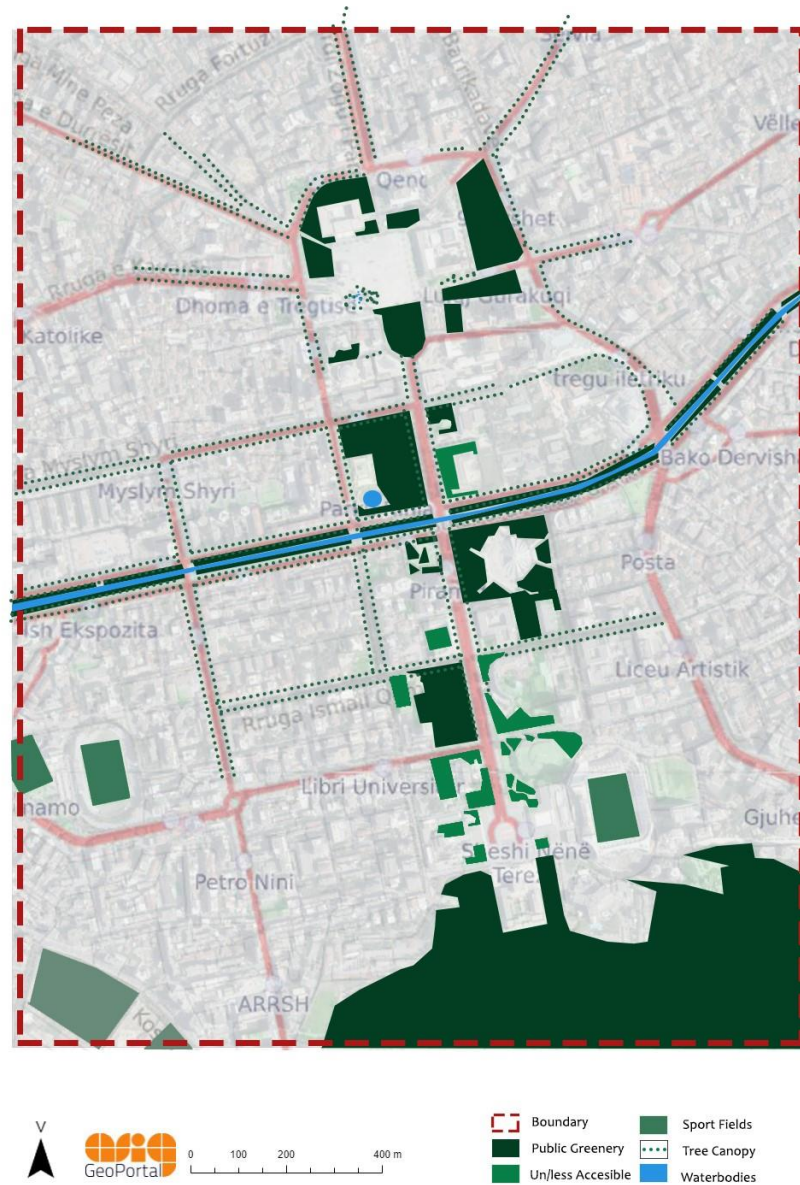


Figure 35. Biophilic Layers in Tirana’s belt (Courtesy of the author)

Tirana’s range of building kinds and architectural languages has also become one of its most endearing features. We approach the main plaza Skanderbeg square as we travel along Boulevard Zog I, which is flanked by the Italian Building and other magnificent buildings. Turned into a public space with abundant foot traffic, where nature is prioritized as a means of fostering urban biodiversity and controlling the microclimate of the city core. The resulting green belt functions as an antechamber, negotiating the transition between the congested city and the square. Made up of a mix

of old and new public spaces and gardens, it fosters a pure collaboration between people and nature while also inviting them to experience and participate in its activities. Albania's diversity in various species and types is therefore valorized, allowing public space to serve both recreational and educational roles.

This main green belt is followed by a list of Biophilic and natural assets (*Figure 34*) such as Rinia Park, Reja, Promenade Murat Toptani, Tirana Pyramid, and so on (as illustrated in *Figure 35*). The coexistence of green infrastructure with the existing historic building should be underlined. There is plenty of opportunity for improvements and discussions, but each element is interconnected and builds a sustainable and robust framework through a complimentary connection.

The significance of recovering nature and inspiring life's habitats around us to sustain biodiversity leads to chances for engagement with nature in our everyday lives, increasing a good natural experience (*Table 11, 12, 13*). Activities that improve experience with nature and promote biodiversity are necessary to increase collaboration with natural ecosystems for long-term experiences.

The main objective for Tirana was to build an environmentally sustainable community (as opposed to the suburban sprawl model) that is distinct from typical New Urbanism projects in which individual uniqueness is allowed less. While adhering to established standards to assure “green” design and sustainability (such as building quality, design integrity, and the use of a suitable variety of plants).

1. The Main Square (Skanderbeg Square)
2. Rinia Park
3. Reja
4. Promenade “Murat Toptani”
5. Park “Lulishtja 3 Vellezerit”
6. Artificial Lake of Tirana
7. The Grand Park
8. The tree canopy that lies in every street that connects the above places.

Table 11. Biophilic Taxonomy Survey: The presence of biophilic features in Tirana’s Main Corridor; Skanderbeg Square to Grand Park (Courtesy of the author)

No	Biophilic Features	Biophilic Example	Common Benefits
1.	Parks	<ul style="list-style-type: none"> • Rina Park • “Lulishtja 3 Vellezerit” • The Grand Park 	
2.	Linear Green Corridors	<ul style="list-style-type: none"> • Promenade Murat Toptani • Boulevard Zog I • Linear Tree Canopy of the main roads of Tirana 	<ol style="list-style-type: none"> 1. Social Quality 2. Environmental Quality 3. Space Quality
3.	Pocket Garden/s	<ul style="list-style-type: none"> • Skanderbeg Square Pocket Garden • Sunken Garden 	<ol style="list-style-type: none"> 4. Health Efficiency 5. Stress Reduction
4.	Waterbodies	<ul style="list-style-type: none"> • Artificial Lake of Tirana • Lana River 	<ol style="list-style-type: none"> 6. Cognitive Performance 7. Increase community sense
5.	Green Roofs	<ul style="list-style-type: none"> • Vegetation in Apartment Buildings Terraces 	
6.	Green Open Space	<ul style="list-style-type: none"> • Reja Greenery • Pyramid of Tirana • Greenery Open Space 	

Table 12. Biophilic Fetures Area: The green Belt of Tirana (Courtesy of the author)

No.	Biophilic Features	Area of each feature	% of Green Areas
1.	Parks	320,4777m2	10.68%
2.	Linear Green Corridors	19,222m2	0.64%

3.	Pocket Garden/s	33,600m2	1.12%
4.	Waterbodies	31,839m2	1.06%
5.	Green Private Space	21,049m2	0.7%
6.	Green Open Space	13.602m2	0.45%
Total Biophilic Areas		439,789m2	14.65%

Table 13. Biophilic and Non Biophilic Areas % Graph (Courtesy of the author)

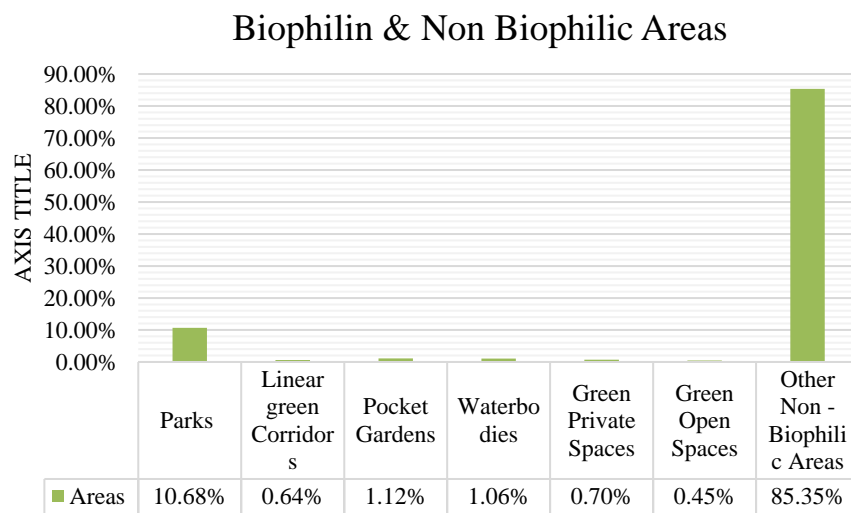
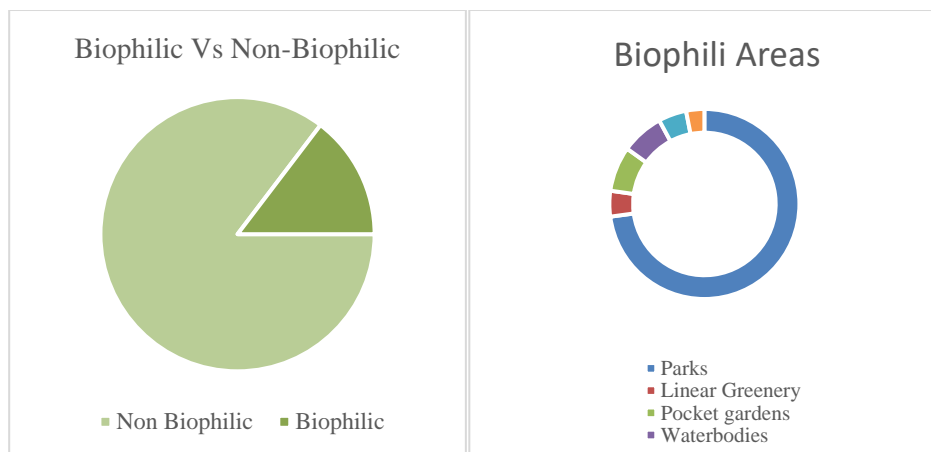


Table 14. Biophilic and Non Biophilic Areas % Graph no.2 (Courtesy of the author)



Tirana’s human-nature cultural component is crucial not only for long-term goals, but also for community health and well-being. In many aspects, it has come to be considered as the most significant achievement of the development. The two primary ideas to be implemented in Tirana's neighborhoods to create a place of development and restoration—a place to promote deep relationships and engage with biological systems—are sustainability and biophilia.

Tirana has just recently begun to promote these concepts as the globe embraces various green ways and accumulates a green future outlook. As a city in transition, the ultimate answer has yet to be found, but what is crucial is that there are numerous green projects in the works that are just waiting to get started. Tirana's ability to implement these sustainable and biophilic techniques would foster good relationships between inhabitants and natural assets (*Table 15*).

Table 15. Biophilic Design features Survey: The presence of biophilic features in Tirana’s Main Corridor, Skanderbeg Square to Grand Park (Courtesy of the author)

Legend: 5-Strong; 3-Apparent; 1-Not Displayed		5	3	1
Environment Features		The Impact		
1.	Green Roofs		+	
2.	Green Walls			+
3.	Shade Trees		+	
4.	Vegetation Surrounding Building	• Environmental	+	
5.	Street-Vegetation Integration	Awareness	+	
6.	City Parks	• Nature	+	
7.	Linear Green Space	Connectedness		+
8.	City Farms and Urban Agriculture	• Health and Well-Being		+
9.	Urban Waterways	• Quality	+	
10.	Community Gardens	Community Urban	+	
11.	Wetland Trail	Space		+

5.2 Dibra Street as a case study

This chapter will illustrate the boundaries between the natural and built environment of Dibra neighborhood in Tirana, Albania; as well as the main movement routes that feed these areas.

5.2.1. The Context and History of Dibra Street

The site lies in one of the few remaining sections of Tirana's ancient town. Skanderbeg Square, with its large pedestrian area and various natural/historic features, is located in the north-east and is only a 10-minute walk away (*Figure 36*). The area is defined by four major axes: the ancient Dibra Street to the north-west, Saraceve Street to the east, Ali Begeja Street to the west, and Qemal Stafa Street to the south.

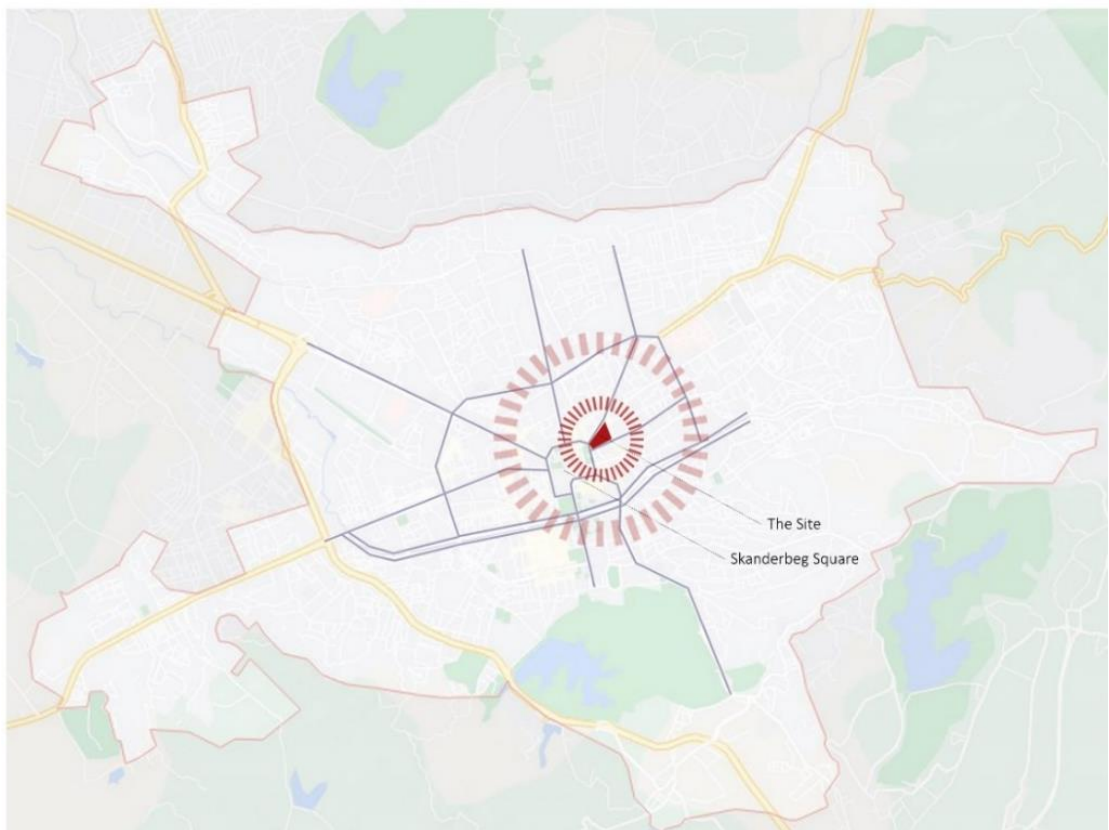


Figure 36. Site Context (Courtesy of the author)

It is highly recognized for its urban character, which stems from the city's pre-WWII spatial features. The urban fabric of WW2 is experienced at the individual building scale as well as the entire neighborhood, within which we can see Tirana's Garden influenced by ottoman era houses, as well as contemporary western villas

during WW2. The area of the property is mostly made up of 1-2 stores residences and some apartment complexes in its perimeter, such as the “9 Kateshet” Buildings.

5.2.2. Site Investigation

From Tirana Macro Scale to “Green Belt”, to Micro ones “Dibra St. Site”.
(Figure 37)

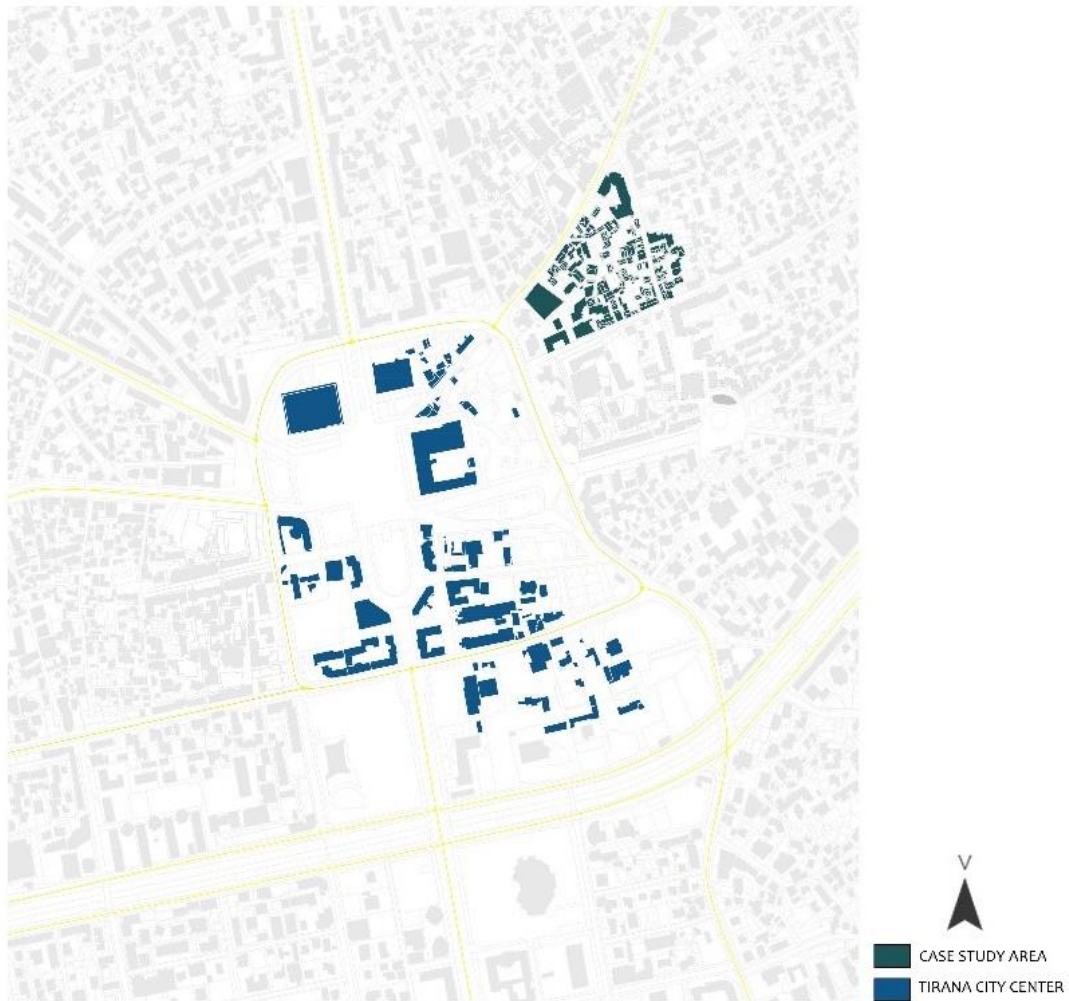


Figure 37. Skanderbeg Square and Dibra Street (Courtesy of the author)

A. Spaces Claimed by the cars

The vehicle is a prestige symbol in Albania, as it is in other ex-communist nations. The city was not initially built to accommodate a large number of automobiles; thus, it is constantly crowded and dirty. As a result, roadways are solely designed for automobiles and not for cyclists and/or walkers, even in areas where more people walk than drive (Figure 38).

Cars not only take up space on the roadways, but they also occupy parking space in the precious public domain.



Figure 38. Dibra Street Context (Courtesy of the author)

B. Private Gardens and People Beyond Walls

The usual residence consists of a modest walled plot with a garden and a single or double-story dwelling for each family (*Figure 39*). Because there are no eyes on the street from the homes, people consider them as dangerous, thus the walls around the plot are primarily erected for safety purposes. As the view from the streets decreases, a downward cycle begins.

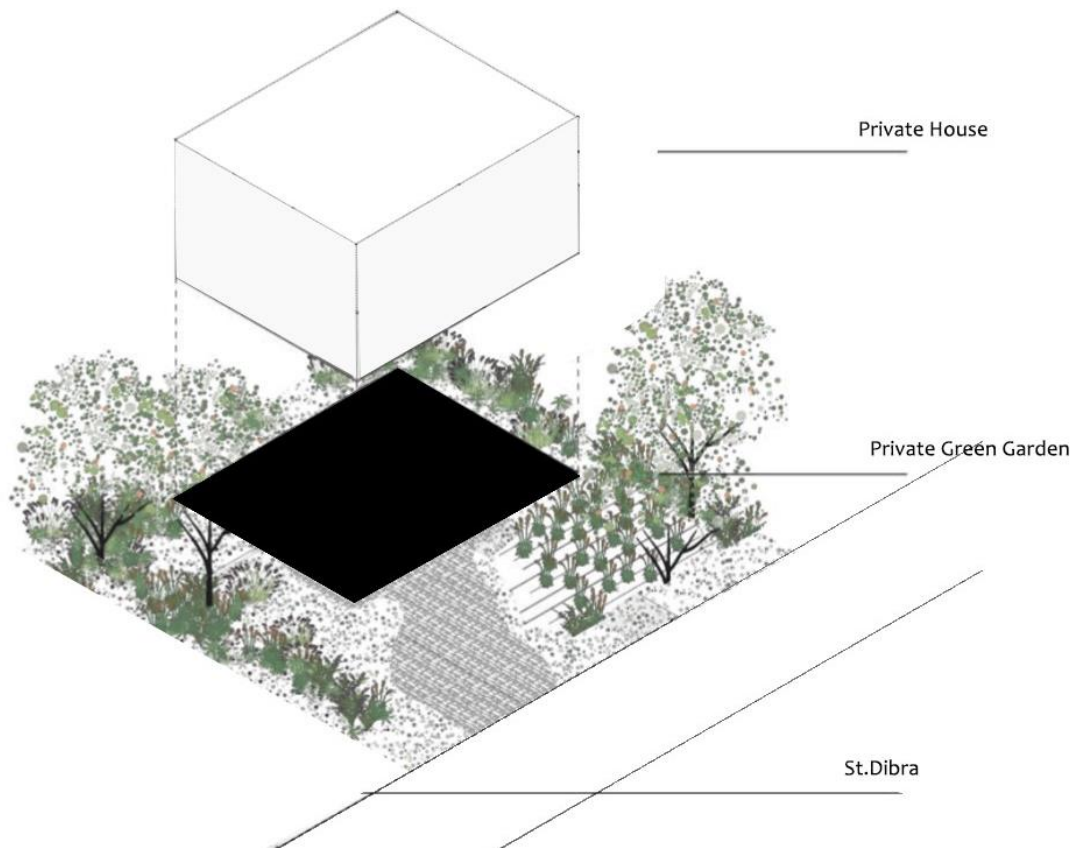


Figure 39. Private Gardens as Biophilic Features (Courtesy of the author)

Despite this, the limitation of public areas recognizes the importance of these gardens. Rather of being ignored, they are an important starting point in a sustainable development strategy (*Figure 40*). The history and unique characteristics of the residents will be utilized to develop new engines and address existing block-level challenges.



Figure 40. Site Conditions Photos (Source: Tirana Urban Youth Competition)

C. Disconnected Infrastructure

The informal city's infrastructure is based on existing roadways built during the Soviet era. Next to it are two typical informal infrastructures, the first of which is a series of parallel roadways, and the second of which is a vein-like structure (example: St Dibra and its secondary roads).

Both of these constructions have a tendency to lead to dead ends, making it difficult to navigate the site. Short treks may quickly become quadrupled in length when a squatter decides to build his home in the center of the roadway, leading to more dead ends, due to the lack of urban planning policies to prevent informalities (*Figure 41*).



Figure 41. Analyses of the existing Alleyways' (Courtesy of the author)

D. Public Open Space Current Situation

The neighborhood has a combination of residential dwellings, apartments, and third-places such as stores and café bars, particularly around Dibra Street's perimeter. The informal parking has taken up all of the space between the buildings, resulting in a shortage of public spaces, a lack of natural assets, greenery areas for residents to use, and leaving the only choice for indoor third places as public ones to use.

E. Build vs Natural Environment

A deeper knowledge of the need and the consequences that lead us to the processes of space change and their features such as economic activity, where people live, work, leisure activities, and natural components are essential in determining life quality.

Also important in the relationship generated by the dynamics of urban growth is the recognition of the many typologies of open spaces transformation, between buildings in the town, which include walkways, squares, gardens, and parks; and the evaluation of effects of changes in the system.

As these locations have lowered the areas and advantages, the demand for such spaces has considerably grown. Private spaces are divided into two categories: family-private and public-private. Rather than taking the shape of a garden, private spaces typically take the form of balconies and courtyards. These rooms were built in response to the need for more dwelling space in high-end residential surroundings.

The front of the apartment on the first floor is encircled by a courtyard that is utilized for private usage, flowers, or as an event area. While historic private yards have just a modest density in building, they symbolize the mainly vast areas that frequently-become part of the community in social connections.

Second, we have positive modifications that result in the creation of a new place as a result of changes to other spaces or just functionally. Divided into two categories: urban-public (spaces meant for everyday usage) and institutional or ceremonial (spaces designed for institutional or ceremonial use). Authorities pay a little more attention to squares, parks, key locations, and government courtyards.

5.2.3. Biophilic Features Analyses

The figure 42 illustrates the urban green prints visible in Dibra Site. 4 categories were subtracted: public green areas, private green areas, tree canopy and the urban layer of buildings and concrete streets.



Figure 42. Urban Green Prints (Courtesy of the author)

An observatory survey took place to examine the presence of nature and biophilic features on this site. Table 16 shows a short inspection of biophilic patterns and their strong or not display in the site.

Table 16. Biophilic Design Features Survey: The presence of biophilic features on Dibra Site (Courtesy of the author)

			5	3	1
Legend s: 5-Strong; 3-Apparent; 1-Not Display					
NATURE	Environ mental Features	Visual Connection w/ nature	-View to elements of nature, living systems and natural processes	+	

			Fragrant herbs and flowers	
	Non-Visual		Songbirds; Flowing water;	
	Connection w/ nature		Weather (rain, water, wind); Natural ventilation.	+
	Dynamic & Organic			
	Pattern			+
Natural			Awareness of natural	
Pattern			process, especially	
&	Space & Connection		seasonal and temporal	+
Process			changes characteristics of a healthy ecosystem.	
Light&	Light			+
Space	Space			+
	Natural Shapes &			
	Forms			+
			Material and elements from nature that, through minimal processing reflect the local ecology or geology to create a distinct sense of place.	
NATURE ANALOGUE	Simulation of	Material Connection w/ Nature		+
	Natural Features		Rich sensory information that adheres to a spatial hierarchy similar to those encountered in nature.	
		Complexity & Order		+
NATURE OF	Place-Based Relations	Preservation & Placemaking		+
	hip			

Evolves			
Human-			
Naturer	Prospect & refuge		+
Relations			
hip			

5.3 Biophilic Opportunity Scoring: Analyses and Calculations

5.3.1. Hexagon Method Analyses_GIZ

According to Biophilic City.org, a city is biophilic if you are within 300 meters of any natural elements such as parks or waterbodies. The same is true for blocks and neighbourhoods, albeit with a narrower radius of around 50m and 5m, respectively.

The first depicts direct access to a natural feature within a 5-minute walk, while the second is roughly a 1-minute walk.

Why Hexagon?

Hexagons are the most circular-shapes polygon that can tessellate to form an evenly spaced grid.

A. Use of Hexagon tessellation Method to create a biophilic opportunity map

1. The approach identifies where people are located and whether or not these groups of people have enough access to biophilic patterns.
2. Two distinct scales: first, a 50 m radius hexagon, which is about a 5-minute walk; second, those hexagons were tightened down to a 5 m radius, which is comparable to a 1-minute walk.

Cycling through the hexagon methodology at two different scales, the main green belt of Tirana that pass through the center, and the St Dibra Site. Moving Down from the city scale to community scale.

B. Use of Hexagon tessellation Method to Green Belt

The approach prioritizes extracting a varied number of biophilic layers from EO Data, such as parks and water bodies. Layering them together will result in an already existent inventory of their Biophilia. The hexagon tessellation is used at a radius of 50 m, which is deemed an accessible distance and is about comparable to half a block or a 5-minute walk. The study is based on the basic notion of determining how many of these hexagons overlap or are within 50m of biophilic features using a spatial selection (*Figure 43*).

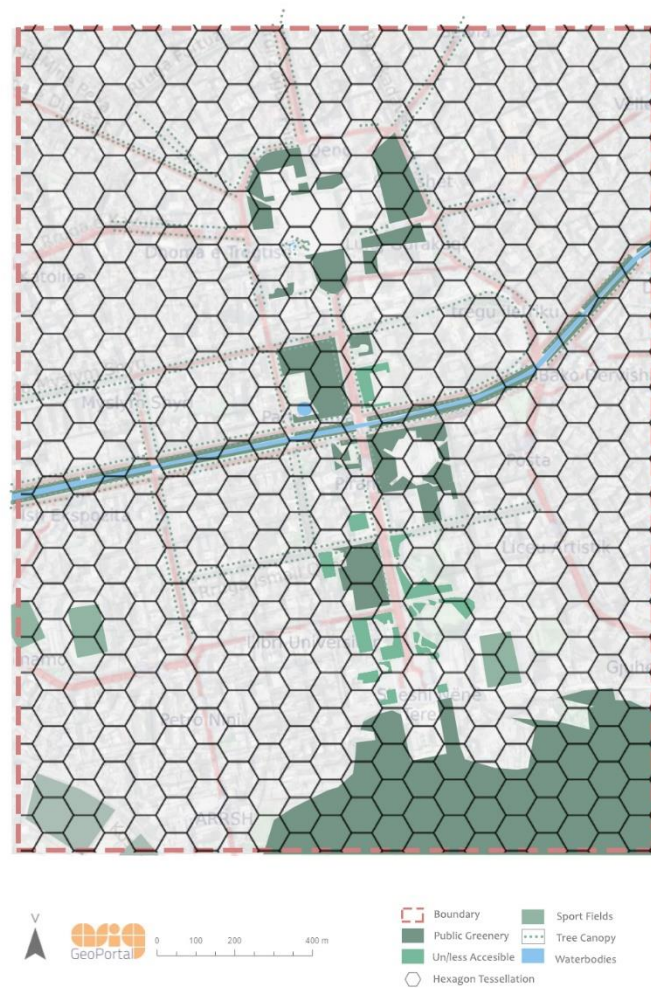


Figure 43. Green Urban Prints and Hexagon Tessellation Method (Courtesy of the author)

This approach may be used to develop further multi-criteria studies that explore where individuals are placed within the city and whether or not those clusters of people have access to Biophilia (*Figure 44*).

By normalizing data to the hexagon grid, overlaying characteristics on top of it, and doing spatial selection, we can obtain a sense of how much of our population has direct or easy access to Tirana's natural assets. Furthermore, we may develop as many alternative criteria to apply to this analysis in order to determine how biophilia compares to other urban factors.

- Pentagon with a 50m radius = 6495 m²
- Total Areas has 470 Pentagons = 3km²= 3000000m²
- 3 Areas as illustrated in *Table 17, Figure 45*. (1-Biophilic w/ nature; 2-With Biophilic Tendency; 3-No biophilic)

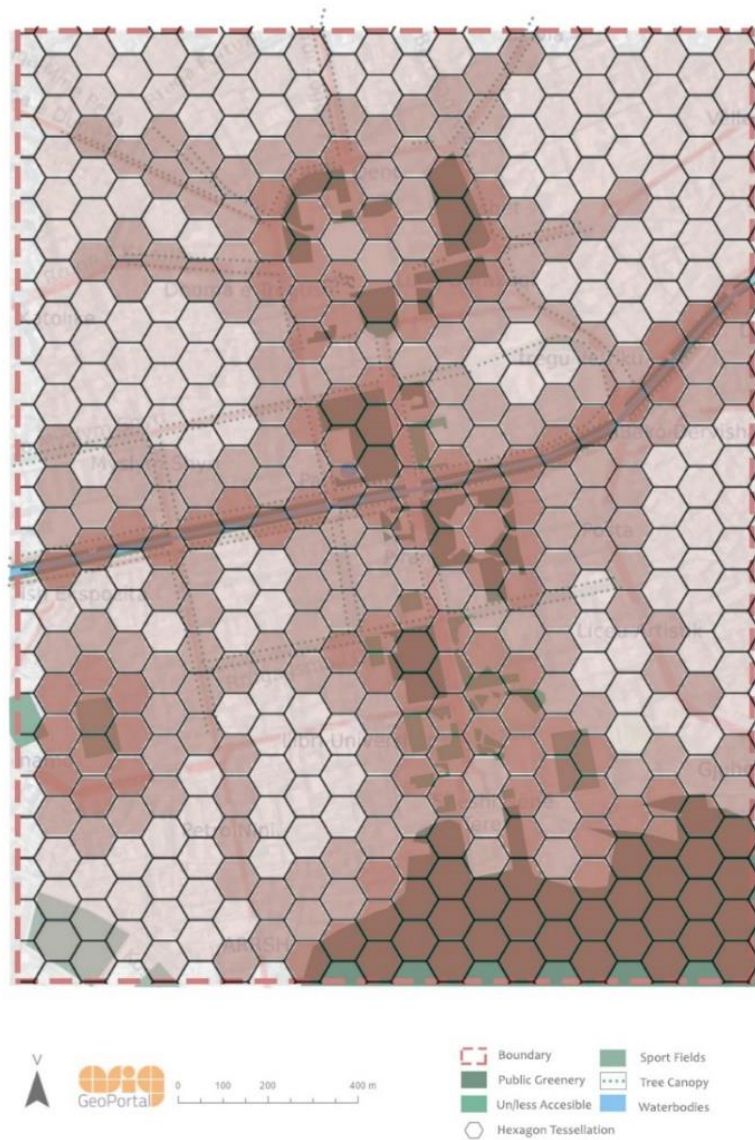


Figure 44. Biophilic Opportunity Score of Tirana's main Green Belt
(Courtesy of the author)

Table 17. Biophilic Fetures Scoring at Tirana’s Center (Courtesy of the author)

	Biophilic Level	Nr of Pentagons	Area	%
1.	Red (Biophilic)	136	883,320m2	29.4%
2.	Light Red (Non Biophilic)	151	980,475m2	31%
3.	White (Non Biophilic)	183	1,188,585m2	39.6%

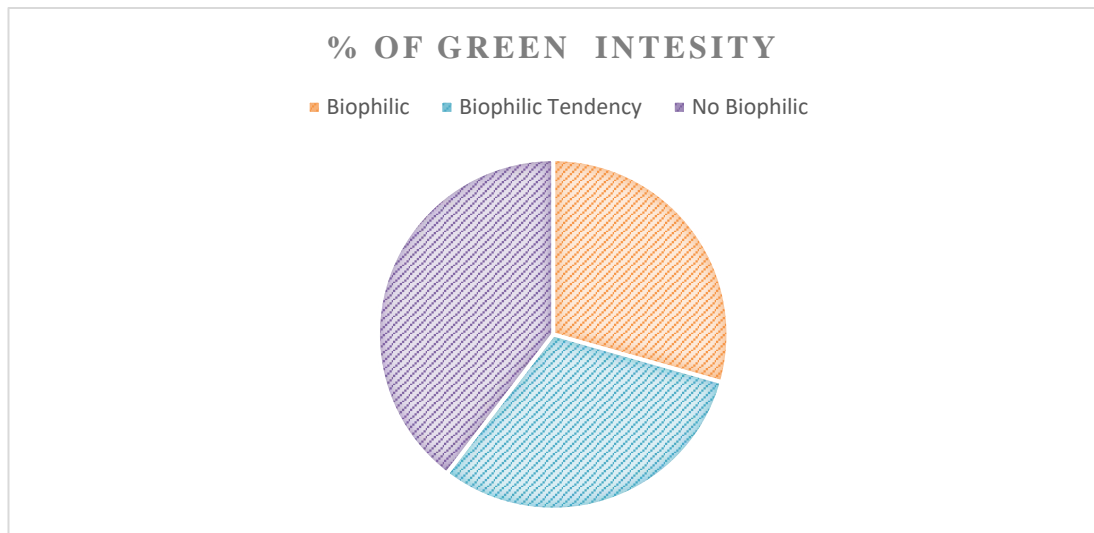


Figure 45. The intensity of biophilic features at Tirana’s Center (Courtesy of the author)

C. Use of Hexagon Tessellation Method to Dibra Site

- Pentagon with a 5m radius = 64.95 m2
- Total Areas has 470 Pentagons = 3km2= 3000000m2
- 3 Areas as illustrated in *Table 18* (1-Biophilic w/ nature; 2-With Biophilic Tendency; 3-No biophilic)

This paper will concentrate on one of Tirana's oldest neighborhoods, St Dibra Perimeter. In order to conduct the evaluation, a number of distinct natural feature

layers are extracted. Tighten them down to a radius of 5 m by using hexagon (*Figure 46*). Because of the site scale differences, comprehending Biophilia in a narrower dimension is required.

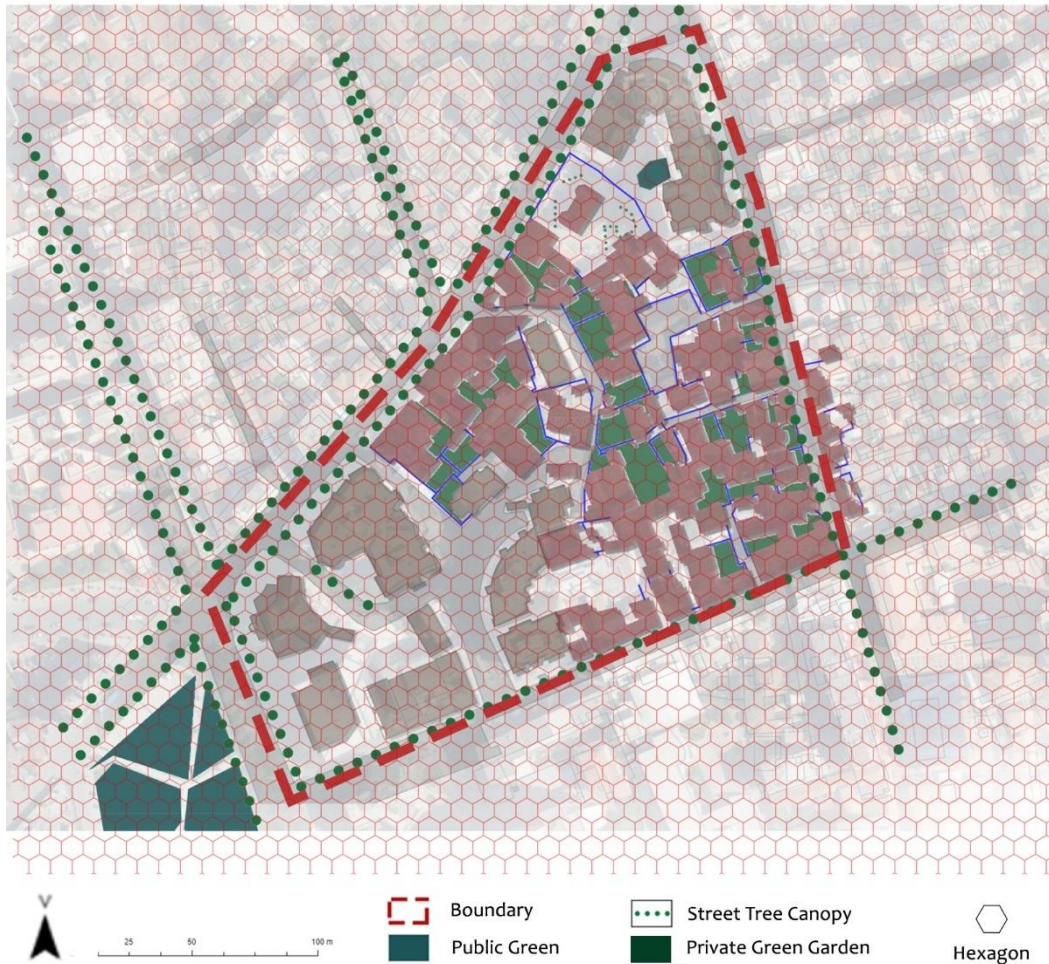


Figure 46. Green Urban Prints and Hexagon Tessellation Method in Dibra Street (Courtesy of the author)

Creating a scoring Opportunity map of Biophilic Feature at Dibra Site using spatial joint and analysis. Evaluating various green layers, such as green connections and tree canopy alongside main roads

Understanding the Difference Between Biophilia Use on a smaller scale as the setting shifts from public (Tirana Center) to private residences and gardens within the Dibra Site Perimeter walls. This may be used with other variables to solve the site's issues caused by a lack of biophilic features, as well as to appreciate the potential regions (*Figure 47*), (*Figure 48*).

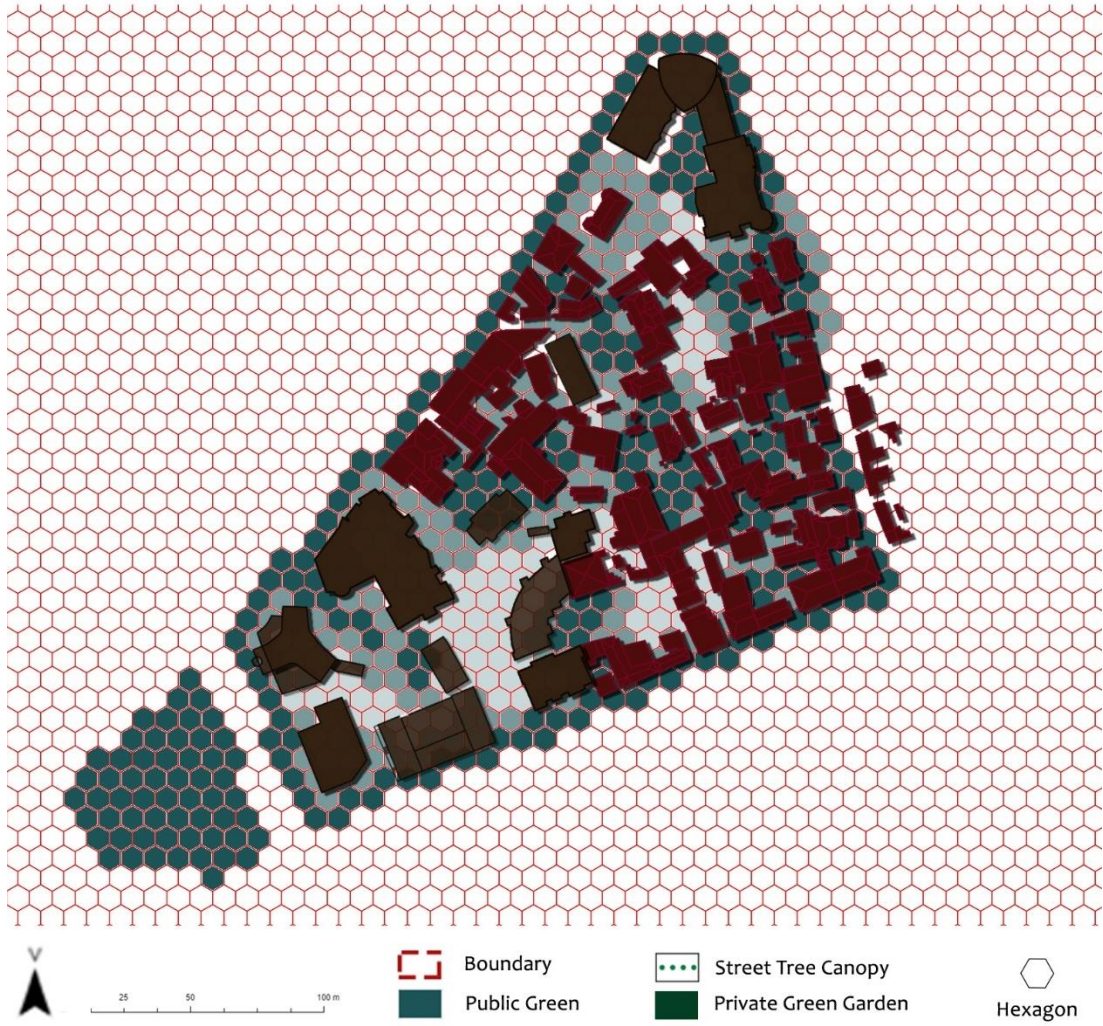


Figure 47. Use of Hexagon Tessellation Method at Dibra Site (Courtesy of the author)

Table 18. Biophilic Fetures Scoring at Dibra Site (Courtesy of the author)

	Biophilic Level	Nr of Pentagons	Area	%
1.	Green (Biophilic)	276	17,926m ²	33.8%
2.	Light Green (Non Biophilic)	154	10,002m ²	18.85%
3.	White (Non Biophilic)	387	25,135m ²	47.35%
	Total Area	817	53,062m ²	100%

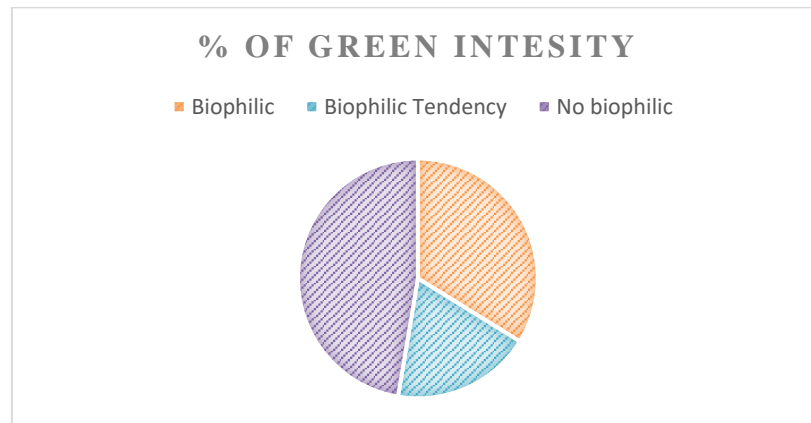


Figure 48. The intensity of biophilic features at Dibra Site (Courtesy of the author)

D. Biophilic Patterns Observation (Figure 49)

- Visual Connection with nature: Inner gardens trees and flowers; Green Roofs
- Non-visual Connection with Nature: Birds Songs, Surfaces warm from sunlight, Flower scents in the inner houses' gardens.
- Thermal and air-flow variability: Thermal comfort due to shade of the street and garden trees
- Presence of water: Lack of Water Presence
- Dynamics and diffused light: Direct Sunlight due to the large number of single houses, Shadows from trees and buildings, dappled light through trees.
- Biomorphic forms and pattern: Natural Forms are missing
- Material Connection with nature: traditional houses with local materials
- Prospect: Being a residential area, it provides private seating in each inner gardens, but despite that there is a lack of private prospect.
- Refuge: Limited visual access into the private houses from outside the streets Safety Perception

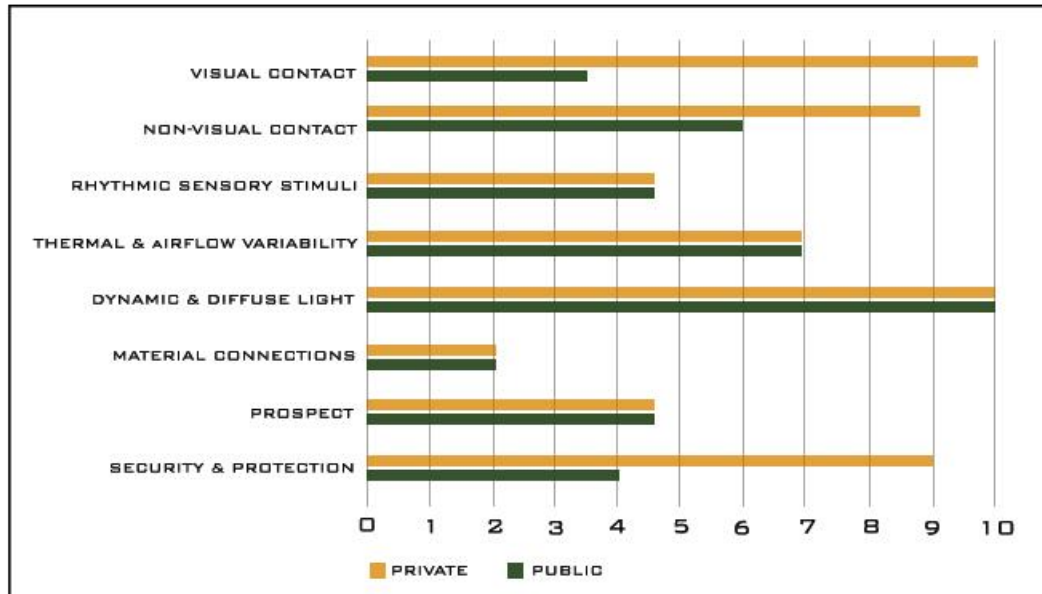


Figure 49. Degree of Patterns Exposure in Dibra Site_Inner gardens and public areas (Courtesy of the author)

Despite its proximity to Tirana's main Green Belt in the city center, the Dibra Site can be identified as lacking in public parks and open spaces. This is due in part to restricted access to private land as well as houses behind walls or spaces occupied by cars, which have been converted into parking areas.

Despite being next to the main Green Belt of Tirana located in the Center, the Dibra Site can be identifying as deficient in public parks and open spaces/This is partly due to restricted access to private land and also to the houses behind the walls or spaces occupied by cars, turned into parking areas. The inner gardens, as well as the tree canopy on the neighboring roadways, contribute to the visual connection with nature. While the presence of water is missing. There is no public green network, and the numerous green spots are concealed inside the walls of dwellings. There are many biophilic designs in private residences, indicating that residents are aware of nature's connections and advantages, but there is still a long way to go to increase the public's understanding of green integration.

5.3.1. Professional Confrontation_Table & Surveys

Biophilic urban acupuncture aims to intentionally incorporate nature on a range of scales into the urban environment, where deep interactions with nature are sometimes rare due to conflicting social and economic pressures.

To illustrate the significance of strategically situated cover of nature in urban situations, it is necessary to examine professional’s awareness in Tirana's Case. When responding to the survey, several circumstances may come into play. The amount of time and distance required to get to the green spaces are other essential factors to consider, since they may influence a person's inclination to walk to these locations. Some study shows that people who have a strong connection to nature walk further for biophilic rather than non-biophilic environments, however, these findings are based on persona rather than the appeal of nature.

As a result, there is a need for data focusing on places with varying biophilic levels (quantity and quality of biophilic patterns) and the pull they have on people over a particular timeframe.

Data were collected from 30 Tirana’s Professionals Responses (Figure 50, 51, 52):

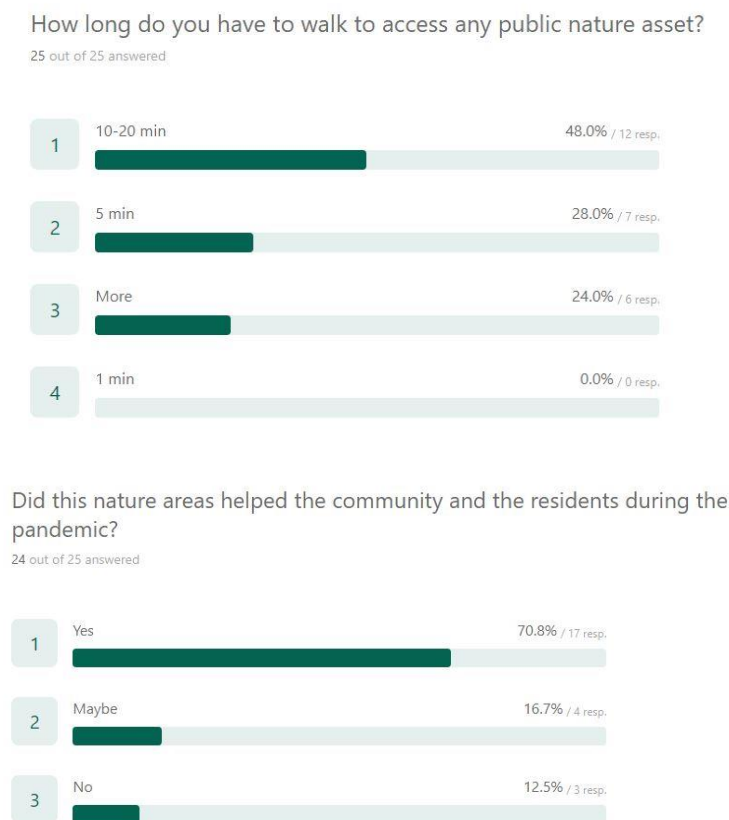


Figure 50. A) The Direct Access with any public nature B) The importance of them during pandemic (Courtesy of the author)

Would you prefer to have access towards any public nature asset?
24 out of 25 answered

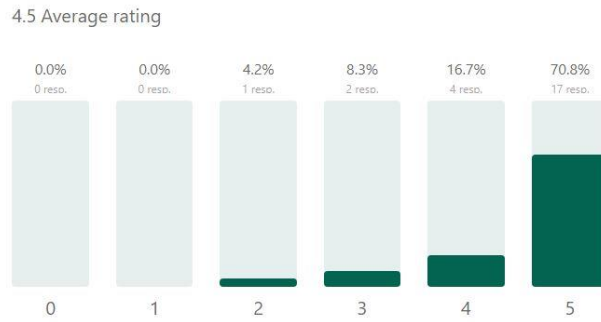


Figure 51. The average rate of the tendency of these professionals; architects and urban planners. (Courtesy of the author)

ENVIRONMENTAL AWARENESS

25 out of 25 answered

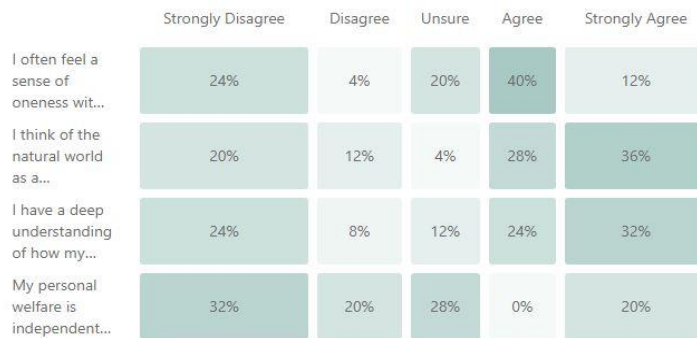


Figure 52. The environmental awareness toward specific biophilic statements (Courtesy of the author)

CHAPTER 6

RECOMMENDATION & CONCLUSION_NEXT STEP

6.1 Findings and Discussions

The availability of biophilic areas is critical to the livability of cities and the well-being of their people. I acquired insights into the function of green spaces in the city by investigating the elements involved in selecting a sitting place and the experiences of its users. People's replies show that they overwhelmingly enjoy the presence of nature and want to interact with it, yet greater travel lengths are a barrier for many. The results supported the predicted need for biophilic urban acupuncture by demonstrating that convenience is unexpectedly significant, indicating a need for more frequent and higher-quality biophilic interventions in urban areas. Cities may make regenerative experiences more reachable by seeing the city as a net of biophilic and non-biophilic places. This study presents information that can inspire city planners, policymakers, developers, and community members to appreciate nature in cities in order to boost availability to biophilic zones for all city residents.

In this chapter, the data from the mapping/questionnaires was utilized to test the premise that "biophilic design will increase environmental awareness and natural connectivity (as demonstrated by a better score on the environmental awareness and nature engagement report). In the research scale, this is significantly linked with greater quality of health and wellbeing outcomes of inhabitants.

Given that biophilic environments have both a qualitative appeal and health benefits, access to these areas through biophilic urban acupuncture can be beneficial. To maximize the positive impact of these activities, regulations encouraging biophilic approaches should be promoted, so that frequent exposure to nature becomes a part of everyday in cities.

As the biophilic opportunity mapping indicates, the heart of Tirana contains a variety of public biophilic patterns; but, as we move to distant blocks, this pattern occurs to be absent or has grown private as the number of resident dwellings increases. It is crucial to note that the construction of additional and closer green areas may also

boost the advantages of engagement with nature. Danish research, for example, discovered that distance from urban green areas was strongly related to stress levels and obesity. While in Tirana, there is a lack of knowledge of natural assets owing to a variety of issues such as people's culture, free time, or the distance to have a direct relationship with nature. In addition to availability to biophilic environments, the quality of a space may also be significant in promoting a connection with nature. Our findings reveal that the location with the highest biophilic intensity (Tirana's Center) also had the highest mean, median, and maximum walking distance measurements, suggesting that the quality of a biophilic experience is important.

Creating more appealing areas in the city may promote more walking and interaction with nature. The poll results show a mismatch between goals and practices, showing that people do not make the choice or attempt to be in interaction with nature despite saying they would, and this contradiction may be related to the inconvenience of the locations. This problem might be handled by making suitable design decisions that take into account the spatial frequency of sites, resulting in a tight network of distinct, high-quality, and easy biophilic operations. Interventions of various sizes may be performed to encourage biophilic urban acupuncture, ranging from vast public parks with acres available to a vegetated planter box with little space.



Figure 53. Tactical Urbanism as a Biophilic Technique (Source: Google Image)

In this way, strategic planning and biophilic design that take into account a site's size, visibility, walkway, height, and accessibility to other spaces and/or buildings (among several other variables) can develop solutions that are both biophilic and useful, having a huge impact on people in the urban setting. Tactical urban design (*Figure 53*), whether recognized or otherwise, may be a kind of strategic planning.

Tactical urbanism is a relatively new idea that incorporates small-scale practical initiatives, typically initiated by local groups and brought to governmental authorities and developers, to improve the sustainability of cities. Open streets for socializing, walking, and cycling; use of waste items to create sitting spaces (*Figure 54*); and guerrilla gardening, or the conversion of unclaimed pavement into green space, are all tactics. Tactical urbanism can be an effective technique for increasing targeted access to biophilic environments.



Figure 54. Green Parklet Application (Source: Google Image)

Heading to the Dibra Site, the value of open public spaces, as well as its relationship to green infrastructure, has been overshadowed by the number of private areas. Residents are concentrated within the borders of their home, where they have built a little private garden for their family. As a result, strategic biophilic suggestions for connecting these private spaces with other places must be explored (*Figure 55*). It is critical to enhance the public zone while removing the vehicle occupancy, which creates nothing more than a monotonous urban landscape. It is critical to enhance the public zone while removing the vehicle occupancy, which creates nothing more than a monotonous urban fabric.



Figure 55. Use of Green Alleys to improve community connection on Dibra Neighborhood. (Source: Google Image)

Biophilic ratio, Biophilic performances, and Biophilic surroundings

In general, there aren't enough open green places in the neighborhood. Green spaces in the study region are classified into three types: public, semi-public, and private/prohibited green spaces. These that are open to the public are typically not well maintained and are not entirely free, making them unavailable to some user groups. Moving into the City Center, there is a noticeable difference, with its better-maintained green areas and tree-lined upper-level pedestrian promenade. Semi-private green areas are usually in front of huge floating restaurants and permanent barges, and they are mostly inaccessible. Green open spaces are primarily found in the Center Areas, mostly in the form of pocket gardens and tree canopy integrated in squares. On-site investigations indicated that the majority of user groups prefer sitting over the tree's shadows or doing other activities such as walking, running, and, in a few cases, cycling.

Connctivity & accessibility

There is a lack of lateral interaction with surrounding communities since the Center Green Belt Areas are occupied by uses that restrict public access, such as several of City's institutions and private installations. that decrease the potentials of the utilization these areas for leisure or recreation, and due to the fact that nearby neighborhoods are mostly cut off by busy roads and other physical barriers. Despite everything, the whole area shows a potential future green corridor. A for the Dibra Site

the connection is missing, due to the lack of public green patterns. It is important to enhance and bring to life the in between places, and enrich the connection between the single houses and residential units. While the physical borders of the buildings (Avllite) should be used as a mean of green installation, not as blank barrier (*Figure 56*).

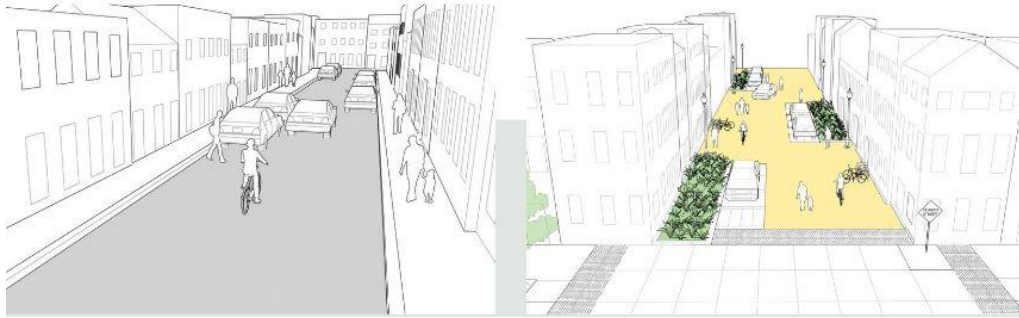


Figure 56. Shared Green Street to meet all residents needs (Source: Google Image)

6.2 Responses, Strategy, Proposals/Solutions

As previously said, biophilic design encourages a direct connection to nature and the natural process. This research examines the existence of biophilic design elements in Tirana's Center and Dibra Site. Representative elements include a deep interaction with environment, framed views and easy access to the woods, water features, different habitats and ecosystems, and stone and wood building materials suited for rural and more natural locations, among others.

The study employed a mixed-methods approach that included both qualitative and quantitative data. As a consequence, qualitative and quantitative data were presented concurrently in order to thoroughly investigate the following experimental questions:

- Can biophilia promote community health and well-being in built spaces by increasing public consciousness and connection to nature?
- Is there a variation in the degree of health and well-being among Tirana inhabitants living in various areas? If that's the case, is the difference due to the presence of biophilic environmental design? If not, why not?

- Is there a substantial relationship between environmental consciousness and natural connectivity and community health and well-being? If so, how so? If not, why not?

Answering these questions results in a list of urban design implications

(Table 19, 20, 21, 22).

Urban Design Implementation.

Table 19. Biophilic design strategies & priorities in general (Source:Wilson, 2006-2008)

General

Incorporate biophilia early in the planning and design phase

Identify Biophilic Design in all buildings, particularly those for children, the early, and the disabled.

Incorporate ecological education with building design.

Look for methods to incorporate biophilic design into both existing and future structure.

Assist in spreading awareness

Create Intriguing landscape and structure

Factor attachment to place

Table 20. Biophilic design strategies & priorities in Site Design (Source:Wilson, 2006-2008)

Landscape and Site Design

Create open areas surrounding structures.

Preserving existing trees and natural ecosystems.

Plantings and natural surroundings should be provided around structures.

Create paths across naturalized and landscape regions.

Replace impervious landscape surfaces with diverse native plants.
 Install living walls on the outside of the building.

Table 21. Biophilic design strategies & priorities in Building Design (Source:Wilson, 2006-2008)

Building Design
Nature views should be provided.
Blur the transition between the interior and exterior spaces.
Avoid interface with key sightlines.
Provide higher levels of daylighting.
Provide green roofs.
Incorporate vegetated areas and interior planting beds.
Incorporate living walls and other living systems for air & water purification.
Create a sense of complexity- yet order-in building design.
Address both spaciousness & refuge in building design.

Table 22. Biophilic design strategies & priorities in Interior Design (Source:Wilson, 2006-2008)

Interior Design
Decorate with potted plants.
Provide natural material & natural art in buildings.
Configure office space to enhance view of nature.
Provide interpretation as part of the interior design.

The study sought to identify biophilic indicators in the Dibra Neighborhood and Tirana’s Center; however, the most major observation from the analysis of the selected case study area is that, despite a lack of public amenities, public open spaces,

and limited activities, the Center is already a popular place of recreation and leisure for Tirana, but this is lost when shifting into more dense blocks when the direct link is absent.

There are several potentials for the area to be properly developed if it is viewed as more than just an economic engine or a picturesque perspective.

Within this perspective, the following are the primary recognized fundamental challenges within the chosen study area:

- The poor environmental conditions
- There are just a few activities available to the public
- a lack of linked and well-maintained open green areas, as well as a lack of public facilities;
- high traffic volumes, which raise noise levels created within the city;

According to my study, biophilic views of urban waterfronts are heavily influenced by users' experiences with the area as well as the users' individual and social values and interpretations of such spaces as natural regions. As a result, the design and development of urban fabric, as sensitive ecological areas, should promote individual need for contact with nature in order to create good human–nature interactions and, eventually, improve environmental consciousness and promote sustainable development. As a result, in order to address the abovementioned main concerns, the research proposes a number of solutions, which are as shown below (*Figure 57*):

1. Create a linked network of open green areas along the center, taking into account their quality, upkeep, and public access while moving into the Dibra Block.
2. Reduce the amount of parking cars occupying the limited open space.
3. Support green activities and provide efficient public amenities to support intense use of the green spaces, as well as create a net between Tirana's center and other Blocks (Dibra Block)
4. Remove concrete edges and create a continuous path of riparian plants along the streets and in between spaces of single houses.



Figure 57. Biophilic strategies in Dibra Site (Courtesy of the author)

6.3 Future Research Opportunities

The first concepts based on indirect links to nature as driven by the elements have far-reaching implications that go well beyond the four recommendations I've provided. The principles may be extended and more levels of complexity introduced. Before adopting any subsequent ideas, the original concepts should be examined for their utility. What works and what does not work? How are people interacting with the spaces? Is it possible to create more complicated areas or places that will need maintenance? While the ideas shown retain a conceptual approach to nature via sensory perception of the environment, future designs should seek to integrate not just features of live nature, but also diverse approaches to sensory design. Furthermore, while this project focused on small-scale design interventions, biophilic design ideas may and can be implemented at any size. Finally, this initiative is clearly about the

necessity of leaving and creating room for plentiful nature and sensory-rich experiences since we rely on them to keep cities happy and healthy. To create self-sustaining nature towns, we must learn through practice and time, morphing into a biophilic framework all city's scales.

Further research opportunities include researching and analyzing the effect of each biophilic element in humans in order to provide evidence as to why these elements are needed in the city, as well as working on building a case study evidence base for the implementation of biophilic design to foster thermal comfort of residents and their buildings. Other studies are needed to monitor and qualify the effectiveness of biophilic patterns in addressing the negative consequences of climate change, environmental degradation, and biodiversity loss, as well as how cost-effective it may be.

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APPENDIX

Survey Questions:

1. Gender

- Male
- Female

2. Age

- 15-25
- 25-45
- 45-60

3. Occupation

4. Education

5. How long have you lived in your current home?
6. Where do you live?
7. Do you like your current house location?
8. Do you know your neighbors?
9. Do you have interaction with them in the in-between areas?
10. Do you have any nature elements in your house or neighborhood?
11. How long do you have to walk to access any public nature asset?
12. How often do you walk to access them?
13. Do you think that nature is a community need?
14. Would you prefer to have access towards any public nature asset?
15. Did this nature areas helped the community and the residents during the pandemic?
16. How was and is the tendency to visit nature areas during pandemic and now?

Scoring Level Question 1-3

1. Do you have an understanding of biophilic design?

2. Do you think biophilic elements should be integrated? (After explaining what they are)
3. What activities do you enjoy the most?

Environmental Awareness and Nature Connectedness-Tirana's Case Study

		Strongly disagree	Disagree	Unsure	Agree	Strongly Agree
1	I often feel a sense of ownership with the natural world around me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	I think of the natural world as a community to which I belong.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	I have a deep understanding of how my actions affect the natural world	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	My personal welfare is independent of the welfare of the natural world.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>