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Biophilic design

Prishtina natural landscape restoration according to IUCN categories in Urban protected areas

Key words / Biophilic city, landscape restoration, IUCN, ecology, Prishtina, Urban protected areas

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Abstract

Prishtina is the capital and the most populated city of Kosova with high air pollution and water contamination. Landscape restoration as a sustainable strategy in management and rescue the ecology and environment in this area is a fundamental approach and has various benefits in social, economic and environmental categories. Landscape restoration strategies cause to drive responsible environment for future generation, and set out goals, and implementation strategies as design approaches to further effective sustainable image of Prishtina.

This paper first addresses the meaning of Biophilic design as a paradigm shift approach in urban design and reasons of the significance of this innovative strategy in sustainable design. It discusses the core concept of biophilic design and its various advantages by the scrupulous literature review that was carried out, in order to incorporate the theoretical and empirical outcomes, of biophilic design. On the other hand, by analysing and developing the IUCN principles in urban edge of Prishtina, the practical methods due to achieving a biophilic design in this region is sketched out. The International Union for Conservation of Nature (IUCN) is a membership Union uniquely composed of both government and civil society organizations and it is the global authority on the status of the natural world and the measures needed to safeguard it. Although Conservation of protected environments was launched in late 1950s in Kosova, nowadays there are tremendous testimonies about degradation of the natural landscapes that cause to lose the image of nature in country and cause the crucial circumstances in Prishtina that threaten the people's public health. Illegal actions like constructions around the peripheral regions of city, industry sites with high air and water pollutions, deforestation and hunting, make environmental issues as the most critical concern in this capital city. This paper applied mixed research methodologies, regarding the interdisciplinary content of the studies that related to the subject, the descriptive-analytical and comparative research method has been applied to present and codify the strategies in this region. This paper follows two linked objectives: firstly: emphasising on the importance of nature and wildness in Prishtina urban lives by Biophilia design approach that suggests the natural landscape restoration is not optional for future urban planning but essential. Secondly: ecological protections and its acceptance by an array of biodiversity and evaluation through review landscape, according to IUCN guidelines in this region is analysed in more depth. Suggestions specify two results: 1) revitalization of ecological, social and cultural values of the city 2) restoration the natural landscapes for the future need. These outcomes provide the context for human well-being and promoting spiritual, scientific and educational value in the urban landscape. Furthermore, decrease in biodiversity loss and climate change, recreational and tourism opportunities are the other critical advantages of this approach.

Defining detailed planning requires interdisciplinary studies in ecological layers, and patterns of landscape mosaic, to protect and rehabilitate nature that consider the processes through the ecological assessments and analysis that is far from framework of this paper. In addition, comprehensive studies in wide range of disciplines from national to international technical analysis about legislations and development policies are beyond the scope of this paper.

Introduction

Nowadays, according to issues of sustainable development, poverty reduction and livelihoods cities the most approving trend in urban planning is regenerating the nature that adaptively rehabilitate the natural features of cities.

"We don't lack tools and strategies for bringing nature back into cities, and there is an increasing number of compelling stories and examples of cities successfully doing just this. In some cases, it is about looking for opportunities to let nature re-establish itself, while in others more aggressive urban interventions are required." (Beatley, 2011) "Examine and discuss this trend is already having profound consequences, for the environment and for people. Everywhere nature is being squeezed and people are losing contact with it. The implications are many and diverse, but they make the conservation of nature ever more urgent and often more difficult to deliver. It is this that makes urban protected areas a matter of crucial concern." (Dudley, N. (eds.) 2008.)

Reconnecting communities to ecosystems have a diversity of irreplaceable effects on improving human health, mitigating climate change, and managing resources for a sustainable society. According to IUCN reports, restoring degraded forest landscapes could create several billion dollars of annual economic activity for the global economy. This achievement narrates the changing in the sense of planting a tree to recreating ecosystem and the difference between reforestation and restoration.

"Today the idea of the forest network (the "Wood Wide Web") is gaining prominence over the dominant view of the last half century, that "... plants [are] individuals... to be studied with neat statistical precision, as if they were atoms" (Benyus in Hawken 2017). Applying restoration policies

and protection guidelines in natural landscapes is different in any region and government around the world, that refers to culture, politics and economy, competence in any society. It's an undeniable fact that with disregarding to the linkage between natural landscape and urban development, the cost of socioeconomic drawbacks of this unsustainable approach is countless. Today, for lack of management institutions in protecting and regenerating the natural layers in Prishtina Kosova faces a number of challenges in different disciplines in society. Applying "Biophil design" is a necessity approach and moral responsibility for urban planning and decision making in this city. If we choose not to consider this priority, then at least we do not proceed uninformed.

According to IUCN (The International Union for Conservation of Nature) categories "Urban protected areas are protected areas situated in or at the edge of larger population centers," (IUCN,2008) urban protected areas around Prishtina city can play a crucial role in maintaining the nature in peripheral regions and reduce many challenges in this city.

Environmental hotspot challenges in Prishtina

Lack of sustainable management, Land use planning laws and policies:

"Natural resources are abundant in Kosova . Kosova is mainly rich in lignite and mineral resources such as: coal, zinc, lead, silver and chromium but also productive agricultural land. "(Uberti, Sahit, 2013) "Kosova is also rich in forests, rivers, mountains and soil; it is among the richest countries regarding natural resources in Europe, based on surface."(Sahit, 2013) protected areas in "Kosova within its small territory are rich in high natural values. Conservation of the natural areas in Kosova through the network of protected areas was initially regulated in the late 1950s." (Veselaj&Mustafa2009). "While in



Fig1 / Prishtina, historical urban context. Source / author 2017

terms of conservation of protected areas a significant progress has been achieved, stagnation is seen in the conservation of rare and threatened species of flora and fauna. Although envisaged by legislation, the Red List of Kosova of rare and threatened species has not been adopted yet. Also, there is a small progress in the implementation of practical conservation and management measures contained in the legislation." (Veselaj & Mustafa 2013). "There are also evident and visible cases of degradation in the territory of national parks such as: illegal constructions, legal and illegal

forests lodging, forest fires, wild animal shootings etc. Constructions in the protected areas and particularly in national parks are not following any of the legal rules. (Veselaj et al. 2012).

Development and construction without reference to the national and international policies and guidelines in protected areas and natural landscapes in Kosova cause to threat exceptional natural values and in Prishtina as a capital city the pressure of unsustainable development is more tangible in many aspects of the city image. Hade, located in the municipality

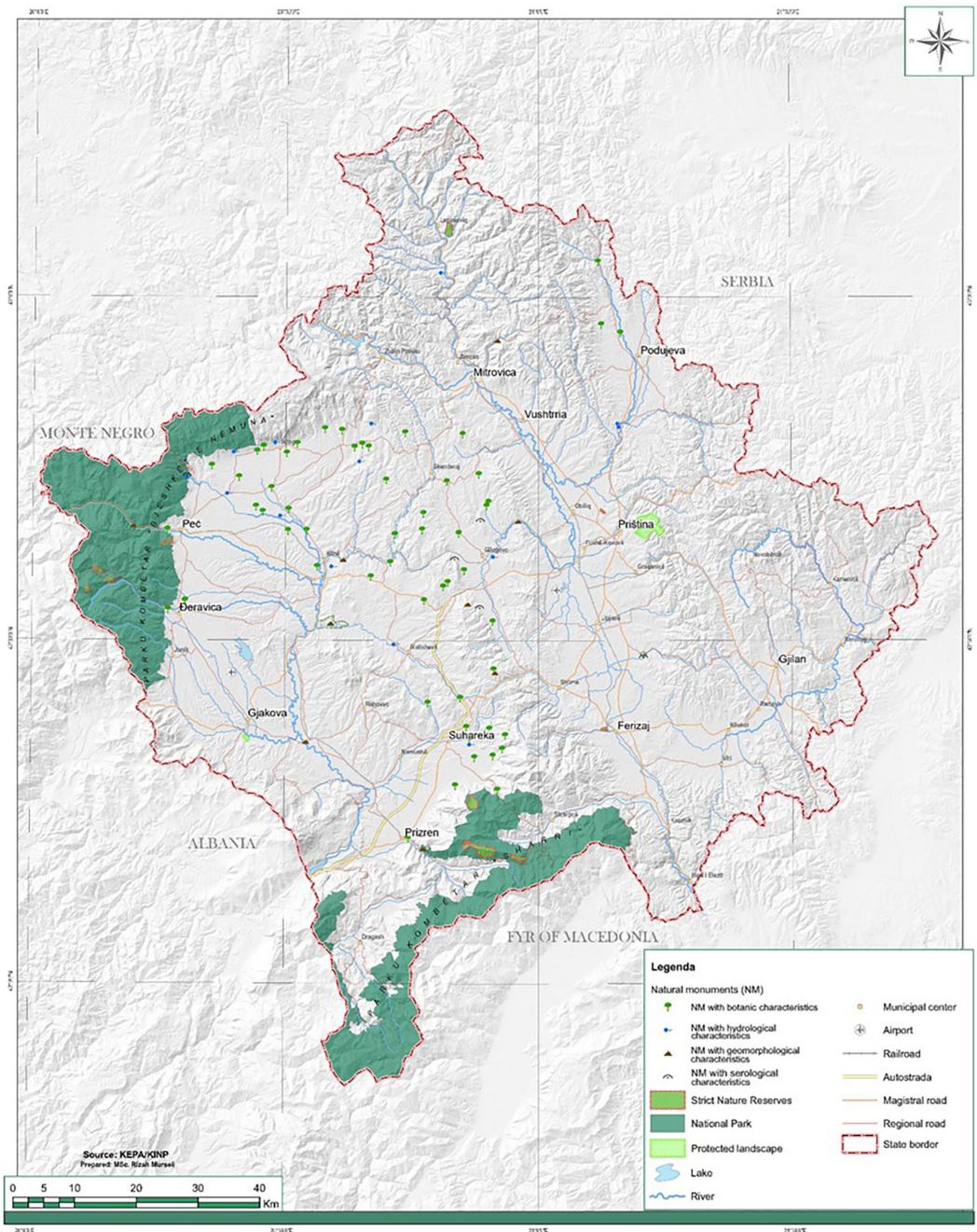


Fig 2 / Map of protected areas network in Kosova . Source / Kosova Environmental Protection Agency

of Obiliq, Prishtina District, that includes three coal mines operating on the territory of Obilić: Belačevac, Miraš and Sibovc. "Hade is again being threatened with destruction. This time, villagers and their advocates say, the threat to their homes is coming from their own country's government and the World Bank." (Michael Hudson, 2015)

"Regional Park of Germia is under management of the municipal company Horticulture" whose main responsibility is to maintain green spaces in Prishtina, the capital city. Marble Cave of Gadime so far has had a type of "private" management, but

without legal basis for privatization." (Veselaj & Mustafa 2013).

Drastic environmental pollution

Water bodies contamination: "The protection, conservation and monitoring of the quality of water resources is one of the biggest environmental challenges facing our society. Industrial development, urbanization, intensive agriculture is just some of the factors that affect water pollution. Despite continued engagement, uncontrolled use of water resources and damage to river beds still remains one of the forms of degradation of our water resources.



Fig3 / Kosova , Obilic power plant. Source / Wikipedia, 2014

Other precipitation pressures are the irrigation of agricultural lands and other contaminants.

Among the biggest pressures on water bodies are industrial discharges of various activities. Soil pollution: "Soil pollution is considered to be the presence of hazardous waste, which is usually not a product of normal pedogenic processes and which causes soil functions to collapse."

(The annual environmental report on the state of Environment in Kosova , 2016) "Land degradation in Kosova occurs especially along the main roads and is one of the most widespread and threatening forms of damage to land and the environment. Various reports indicate land occupation by construction, land degradation for economic activities, improper land-use decision-making, indicating a negative trend of land conservation for future generations. (Annual Report State of the Environment in Kosova , Prishtina, 2017). Air pollution: This situation contributes discharge of pollutants from sources, such as industry, transport, and the consumption of solid fuels, used for heating, as well as, unfavorable conditions for distributing the pollution emitted into air. "existing

coal plants in Kosova cause a total health cost between 70 and 169 million euros per year to the region. Due to long-distance travel of pollutants in the air, Kosova power plants cause a total health cost between 144 and 352 million euro per year to Europe. Plants in Kosova generally operate with low environmental standards, generating high levels of polluting emissions" (J. Xharra .2016). "The electricity sector of Kosova relies on coal-fired power plants (97%)." (Government of Kosova . 2014).

"Prishtina's transport forms the hub of road, rail and air networks in Kosova . Analysis of Traffic Police have shown that from 240.000 cars registered in the Republic of Kosova , around 100.000 cars or 41% of them are from the region of Prishtina." (Sylejmani, 2014). Additionally, the environmental reports about Prishtina appear deficiency of scientific data and integrated environmental monitoring and weakness in legal basis and other institutional and sustainable integrated approach.

Biophilic design core concept, Integrating Nature into Urban Design and Planning



Fig4 / Hade, Prishtina. Source / Visar Kryeziu ,International Consortium of Investigative Journalists, 2015

"Among many recent books on urban nature, *Biophilic Cities: Integrating Nature into Urban Design and Planning* (2011), by Timothy Beatley, professor of sustainable communities at the University of Virginia, stands out as authoritative, practical and concise. ('Biophilic' refers to the term 'biophilia' that was invented by E.O. Wilson to describe the extent to which humans are 'hardwired' to need connection with nature.)" (IUCN, Trzyna, T. (2014). *Biophilic design: about the Importance of Nature and Wildness in Our Urban Lives*. "Our access to wild places and "nature" is shrinking and so is our will to get to those places. As we continue to select urban places to live, the impetus to embed nature, and specifically urban biophilic acupuncture, is paramount." (Jonce Walker, 2015) "Biophilic design can reduce stress, enhance creativity and clarity of thought, improve our well-being and expedite healing; as the world population continues to urbanize, these qualities are ever more important... in Context looks at the evolution of biophilic design in architecture and planning and presents a framework for relating the human biological science and nature." (Browning, W.D., Ryan, C.O., Clancy, J.O.

(2014).) "The conceptual framework for biophilic design that was first laid out by Cramer and Browning in *Biophilic Design* (2008), which established three categories meant to help define biophilic buildings – Nature in the Space, Natural Analogues and Nature of the Space – and a preliminary list of "biophilic conditions" (J.O. Clancy, S.L. Andrews, N.B. Kallianpurkar ,2014)) " Biophilic urbanism and design must occur at all scales, from room or rooftop to region. And it is multi-layered, with biophilic features at different scales reinforcing our biophilic sensibilities." (T. Beatley. 2011) "A biophilic city is a green city, a city with abundant nature and natural systems that are visible and accessible to urbanites. It is certainly about physical conditions and urban design-parks, green features, urban wildlife, walkable environments, but it is also about the spirit of a place, its emotional commitment and concern about nature and other forms of life, its interest in and curiosity about nature, which can be expressed in the budget priorities of a local government as well as in the lifestyles and life patterns of its citizens".(C.O. Ryan, W.D. Browning, 2014) "



Fig5 / Coal-fired power plant, Prishtina. Source / Visar Kryeziu, International Consortium of Investigative Journalists. 2015.

CLIMATE POSITIVE DESIGN



Fig6 / Climate Positive Design / Pamela Conrad, ASLA, CMG Landscape Architecture

A Biophilic city, is even more than simply a biodiversity city: it is a place that learns from nature and emulates natural systems, incorporates natural forms and images into its buildings and cityscapes, and designs and plans with nature. " (T. Beatley. 2011) Although there are many social, cultural, legal,

economic and regulatory obstacles embedded in the Biophilic design approach, but it could find its way in nowadays innovative urban design.

Additionally, Biophilic city core concepts can associate with urban agriculture policies that will produce



Fig7 / Biophilic design: Rua Gonçalo de Carvalho in Porto Alegre, Brazil, is a stunning example of a natural urban Eco link. Source / Wikipedia, 2018



Fig8 / Biophilic city core concepts. Landscape Architect: dwg. Source / Website: studiodwg.com, Austin, Texas, USA, 2017)



Fig9 / City Farms grows in view of the Chicago skyline

edible natural vegetation in modern cities. Urban agriculture has a variety of sustainable advantages in economic, social, environmental, nutrition and quality of food.

“Modern cities almost exclusively rely on the import of resources to meet their daily basic needs. Food and other essential materials and goods are transported from long-distances, often across continents, which results in the emission of harmful greenhouse gases. As more people now live in cities, rather than in rural areas and all future population growth is expected to occur in cities, the potential for local self-reliance in food for a typical post-industrial city was determined.” (S.Grewal. 2011)

IUCN practical guidelines for protecting urban natural landscape:

The Cities and Biodiversity Outlook, published in 2012 by the Secretariat of the Convention on Biological Diversity, speculates that “globally more than 60 per cent of the area projected to be urban by 2030 has yet to be built. The total urban area may triple between 2000 and 2030, while urban populations could nearly double. ‘In other words, urban areas are expanding faster than urban populations. ...Most of this urban expansion will occur in places with low economic and human capacity to protect biodiversity. ... Moreover, many of the world’s cities are located in biodiversity-rich areas such as floodplains, estuaries, and coastlines. ... Urban expansion and habitat fragmentation are rapidly transforming critical habitats that are of value for the conservation of biodiversity across the globe—so-called biodiversity hotspots” (SCBD, 2012). “As our cities continue to grow, we must not abandon the protection of natural areas to the pressures of urbanization, but should instead defend such places, and indeed try to create new space for nature within the urban fabric—even within the

centers of cities urban protected areas are distinctive in two fundamental ways: they offer experiences in nature to the large numbers of people who live near them; and they build urban constituencies for nature conservation.” (IUCN,2014)

Regarding natural restoration of protected areas, conforming with the Land Use Laws is the most important issue in many protected areas in underdeveloped regions. “land use laws from countries on each continent that attempt to achieve sustainable development. Since 1992, when one hundred seventy-two nations met in Riode Janerio, Brazil, and adopted a 300-page plan for sustainable development (Agenda 21), the need for effective legal reform has become more and more evident.” (John R. Nolon,2006)

“The first principle of the Rio Declaration is that “human beings . . . are entitled to a healthy and productive life in harmony with nature.” (Organization of African Unity, 1982) Land use planning laws and policies must emphasize with the other categories of urban landscape like suburban, exurban, and rural more comprehensively. Regarding the national legal laws and international consortiums about protected lands is the priority step to urban planning in these vulnerable landscapes.

Urban protected areas as peripheral regions of populated cities have these distinctive characteristics:

- “They receive large numbers of visitors, including many of them who visit frequently, even daily.
- They relate to numerous actors in the urban arena, including government decision-makers, communications media, opinion leaders, and key educational and cultural institutions;
- They are threatened by urban sprawl and intensification of urban development;
- They are disproportionately affected by crime, vandalism, littering, dumping, and light and noise pollution;



Fig10 / Construction on the natural landscape around Prishtina city. Source / author 2018



Fig11 / Prishtina map. Source / Aguljeln, M. Hoxha, K. Pouryousefzadeh, S. Sulaj, E. Sali, E. Lieshaj, K. 2018.

- They are subject to such urban edge effects as more frequent and more severe fires, air and water pollution, and the introduction of invasive alien species." (Dudley, N. (eds.) 2008.) Urban protected areas are significant for a variety of profits for society, regarding the strategic situation of urban protected areas around the cities they provide unique opportunities

far from other categories of remote natural landscapes. The highest social-economic benefit of restoration of protected areas that is more crucial for edge regions of Prishtina is Poverty relief with Urban protected areas restoration: Investing in natural restoration and ecosystems offers a high positive impact on regional economic development "Experience



Fig12 / BIOPHILIC Design Elements. Source / author

has shown that restoring degraded and deforested landscapes can replace expensive engineered infrastructure, create economic growth, and offset global emissions." (IUCN ,2014)

Biophilic design policies in Prishtina protected area:

Establishing distinct patterns is not an attempt to create cookie-cutter solutions for human-centric design, but rather to provide a framework through which any variable, with the appropriate care, could be adapted with locally appropriate and user-centred biophilic design. Appropriate solutions will result from understanding what suits the unique programmatic needs of a space and its intended user group (R. Kaplan et al., 1998) Considering Biophilic design and IUCN practical guidelines for protected areas and on the other hand, environmental challenges that Prishtina confronts set out above, it could be suggested to draw principles in natural restoration of this region according to the following table:

SCALE	BIOPHILIC Design Elements	IUCN guidelines
BUILDING	Green rooftops for commercial and high-rise residential building. Sky gardens and green atria. Rooftop garden. Green walls to cover neglected facades Daylight interior spaces	Demonstrate, facilitate and promote the health benefits of contact with nature and of good eating habits. Monitor and manage water
BLOCK	Green courtyards Clustered housing around green areas Native species yards and spaces	Demonstrate, facilitate and promote good environmental behaviour. Control encroachment. Reduce impacts of noise and artificial night time light; keep aware of research on electromagnetic radiation.
STREET	Green streets Sidewalk gardens Urban trees Low-impact development Vegetated swales and skinny streets Edible landscaping High degree of permeability	Provide access for all; Breaking down the cultural barriers between the 'natural' and the 'urban' For example, accommodate disabled people and choose words and symbols for compliance signs carefully
NEIGHBORHOOD	Stream daylighting, stream restoration. Urban forests Ecology parks. Community gardens. Neighbourhood parks and pocket parks. Greening grey fields and brownfields.	Engender a local sense of ownership. Engage writers, artists and other creative people and draw on their works and ideas. Promote appreciation of cultural, as well as natural assets. Reduce human wildlife interaction and conflict; keep aware of emerging infectious diseases/ Control invasive species of animals and plants/Cast a wide net for advocates and allies.
COMMUNITY	Urban creeks and riparian areas/Urban ecological networks/Green schools/City tree canopy/Community forest and community orchards/ Greening utility corridors	Communicate carefully and use a range of communication technologies/Cooperate with agencies that have shared or adjoining jurisdictions/Learn from others' experience with collaboration; pay careful attention to structure and process, as well as substance/Seek funding from a wide range of sources.
REGION	River systems and floodplains. Riparian systems. Regional greenspace systems. Greening major transport corridors.	Promote connections to other natural areas/Monitor and manage water/ Cooperate with institutions that have complementary missions/Cooperate with universities in training managers for urban protected areas; facilitate use of these areas for academic research and advanced learning/Take advantage of international organizations and exchanges Promote and defend urban protected areas/Work to make urban protected areas national and global conservation Priorities/ Create and expand urban protected areas./Promote rules and organizational cultures that respect the differences/between urban and more remote protected areas/ Improve urban protected areas through research and evaluation.



Fig13 / Kosova capital - Prishtina city. Source / Wikipedia,2016.



Fig14 / Prishtina city lack of green public spaces. Source / author 2018



Fig15 / Prishtina city lack of green public spaces. Source / author 2018

Conclusions

As more of the world's population shifts to urban settings, the need for biophilic design will become more important (C.O. Ryan, W.D. Browning 2014) Biophilia design suggests that there is an evolutionary and biological need for contact with nature that is not optional but essential in city lives, from this perspective cities are not a combination of senseless buildings and streets, city breaths and grows like an alive creature in the nature. Despite the holistic approach of Biophilic design, there are "Some aspects of biophilia that are inherently difficult to quantify, and due to the relative infancy of the field of biophilic design, we recognize there is a significant need for additional research." (Bilotta & Evans, 2007). Furthermore, monitoring and measuring efficacy of biophilic patterns needs interdisciplinary studies and experts in variety factors create the image of a city from tangible aspects to hidden and intangible values. As this review of evidences about environmental challenges in Prishtina shows, this capital city suffers from many crucial issues that root to unsustainable approach to development and human ignorance in this city. The body of literature cited in this paper is part of efforts to study about integrated design strategies in vulnerable environment in Prishtina. By gathering reports and evidence recording during visit of the peripheral regions of this city in February 2018 and research about innovative and proper approaches in protecting areas in under developed cities, the main guidelines for confront to challenges are declared in this paper.

For Prishtina to create a new image as a European capital city, it requires to follow environment laws from International Union for Conservation of Nature (IUCN) and apply its guidelines. By considering biophilic design and implementation of its patterns could help re-focus the design process

approach to protect and regenerate the natural layers and socio-cultural expectations from inside to city image.

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