ABSTRACT

This project is submitted as a requirement of completing pedagogy training and research development course. To achieve and physically achieve the goals of development by the ministry of higher education in Kurdistan universities this project suggests practicing the principles of biophilic in the existing university campus building. biophilia is a philosophical approach that reflects the innate human need to connect with nature. Studies have shown that biophilic surroundings help people feel less anxious, heal faster, have better attention and cognition, and have more positive views

Contents

1. Introduction

Biophilia is characterized as people's intrinsic liking of the common world, and it has been investigated in Psychology and humanism since the 1980s (Ransom, 2015; Toker and Gray, 2008). In design and plan, there has been a developing and later intrigued within the impacts of nature on individuals in buildings (Turner, 1984). Within the past decade, there has been a noteworthy increment in distributed peer-reviewed plan inquiries about the significance of biophilic plans (Arnett, 2017; Benfield et al., 2015; Cullen, 2016; Matteson,2013; Savanick et al., 2008).

In parallel, there has been a developing interest both in architectural practice and in the scholarly world relating to a superior understanding of the impacts of buildings and indoor situations on people's wellbeing and prosperity. The World Well Being Organization cites misery and mental wellbeing issues as the driving cause of inability around the world (Sidiropoulos, 2018) Since **individuals spend 90% of their time in buildings** (Giulia, Patrizia, &Lorenzo, 2016), the natural plan presents challenges and openings for originators. Within the context of COVID-19, there's expanded uneasiness around indoor situations and a critical center on making spaces that advance passion and physical wellbeing. Understudy and teachers' behaviour and

intelligence in college learning situations are changing quickly. for illustration, numerous campuses are ordering online learning, social removing, and for in-person instruction, littler gatherings (Fisher & Bonn, 2017). It is worth noticing that as colleges move to revive or to coordinate half-breed in-person and virtual educating models for numerous classes, the plan, and qualities of the environments where face-to-face intuition take on uncommon significance.

With numerous perspectives of college instruction being able to be effectivelyconveyed online, such as huge undergrad address courses, the campus encounter has to offer something the digital world cannot. It must be “worth it” for understudies to create the exertion and hazard of gathering in individuals. The Concerns appeared that there are physiological and mental wellbeing benefits to situations that consolidate biophilic plan qualities. Suchas higher than required levels of sunshine, carefully set windows to outline sees exterior, suitable assortment in lighting levels, utilizing common materials, bringing nature inside by consolidating plants, utilizing greenrooftops, and maximizing green spaces around buildings.

Edward O. Wilson (1984) demonstrates that the college situations that join these biophilic plan components might maximize the therapeutic qualities of the environment (Kellert, 2005). Making a difference understudies feel less stretched and be able to center on their learning. The move from an auxiliary to a post-secondary learning environment is imperative for understudies and is connects to expanded autonomy and development. In any case, consider thatit could be a time of instability that influences mental health and scholastic efficiency in a way that's special to this statistical bunch. Various ponders have distinguished mental well-being issues as a major deterrent for college understudies. Thinks about appearing college understudies involve higher misery rates than the common populace 1990s.

Along with encounter instability push, other aspekts such as, study related stretch, family push, and moneyrelated stretch have been related to college students (Zundel, 2013: Allen, 2006). In expansion, the college could be a competitive learning environment and there are tall scholarly desires (Jones, 2013) that cause the stresses to end up more troublesome to oversee for numerous understudies. Colleges have a long history of enhancing the social,and financial competitive focal points of social orders.

The relationship between colleges and their communities has ordinarily beencommonly strong. Colleges can act as testbeds for producing more inventive and dynamic communities and drawing in worldwide businesses and analysts (Wilson, E.O. Biophilia, 1984). To attract the most creative minds, college campuses are looking to imitate the innovation-friendly workspaces of knowledge-based organizations and leading tech firms, such as Googolplex and Apple Park. Subsequently, numerous educators of higher instruction have set up plans to upgrade the quality of their campuses to be more energetic in reaction to developing needs in instruction. The colleges of tomorrow will work on amassing their buildings and open spaces in a congruous setting that opens openings for imaginative learning (Salingaros, N.A. Biophilia,2020).

Inside such a setting, there is a rising request to coordinate other approaches into the arranging and plan of our colleges. Handfuls of experimental and test ponders have affirmed the positive effect of welcoming nature and characteristic highlights into the built environment of instructive education and work environments(Klepeis, N.E.; Nelson,2001). In the meantime, the term ‘feasible campus’ induces a complex set of an endeavor: maintainable instruction (SE) and educational modules (Salama, A.M.2020). Campus operations, question about and initiate maintainability within the community involvement and exercises (Browning, W.; Ryan, 2020), and economic behaviors change (Browning, W.; Ryan,2020) (Kaplan, S.1995).In any case,

the advertised activities of maintainable campuses were restricted to tending to fabric utilization, Nursery Gas Emanations, and administrative compliance. They do not give instruments for locks in individuals with nature in a comprehensive way to realize positive societal, physical, mental, and cognitive wellbeing impacts on the campus clients and their encompassing community.

This venture explores the potential of integrating biophilia in college arranging and engineering to assist develop a culture of supportability and inventive thinking within both the physical and organizational settings of our colleges. The biophilic plan concept was created over the past decade to utilize the conditions and components of nature to advance physical, mental, mental, and otherworldly human prosperity (Parsaee, M.; Demers, C.M.; Hébert, M.; Lalonde, J.F.; Potvin,2019). Biophilia may be a philosophical approach proposed by the American scholar (Edward O. Wilson,2012). Which holds that the natural human got to interface with nature requires a radical change of advanced society. Wilson's theory of biophilia has been reflected in anglesof a few investigated spaces, counting design, and the built environment.

A colossal body of investigation has tied particular prosperity and efficiency impacts to biophilic planning since the work of Calfskin, Pyrgos, Beal, and Lawrence within the 1990s. Calfskin et al. measured the effect of visual get to nature on employees' productivity, levels of push, and work life span. Encourage inquire about proceeds to connect thriving within the work environment to associations with nature. In reaction to this critical bond between human prosperity and nature, this extends centers on advancing biophilic plan standards inside the arranging and plan system of the college campus to be more imaginative and feasible. In addition, it proposes ways of producing a rousing, pensive, and inventive educating and learningenvironment.

The primary objective of this concept is to emphasize the importance of locksin nature in the organizing and planning forms of both organizational settings and the physical arrangements of creative and economical places in theacademic world. Few ideas that provide light on the link between the built environment and advancement based on logical premises were discovered in a review of the literature. (Africa, J.; Heerwagen, J.; Loftness, V.; Balagtas,2019). In addition, this inquiry did not discover a single consideration following the common grounds between biophilia and inventiveness in higher instruction. Encouraged inquiry and investigation are required into innovation-fostering design in higher instruction to develop a point-by-point understanding and details. Hence, this inquiry incorporates an audit of writing from a few disciplines on imaginative learning forms. The contention of this paper(project) is established on bridging the investigating crevices between the organizational structure of the 'innovative university' and the built environment of the 'biophilic university' on one side (Gillis, K. Nature,2020).

The association between maintainability and biophilic plan techniques and properties on the other side. This project begins by providing an overview of the corpus of observational and hypothetical research that has been conductedon the three connected topics of maintainability in higher education. Which are advancement in innovation interchange to the community and markets, as well as biophilia within the academic community's built environment. In this area, the ponder centers on subjective inquiry to discover the zones of cover among these spaces. Based on the investigate writing and the criteria depicted within the moment. To begin with the area a comprehensive intellect outline of the creation of an on-campus innovation-based space is outlined in a cross- linked way that ties biophilic plan components to the method of inventive learning and the system of sustainability or the triple foot line (TBL). These

proposed criteria interface the organizational structure of development in higher instruction and the physical environment of supportability with the qualities of biophilia. At last, they think about proposing a system for coordinating human and biodiversity benefits inside the college campus to support inventive learning encounters.

2. Project goals

Lately the Iraqi-Kurdistan region has steadily begun to emerge in the field of international education (Noruzi & Abdekhoda, 2014). Significant improvementsappear to be taking place in colleges across Iraqi Kurdistan with the goal of attracting foreign and regional students and elevating their education to a global level (Noruzi & Abdekhoda, 2014).

As it is demonstrated in the title of this project, the main aim of it is to boost student's achievement in university campus within the policies of the ministry ofhigher education and sustainable development goals. This project aims to bridge the gap between strategy-based research and the practical issues of designing innovation-friendly university campuses.

In order to achieve and physically achieve the goals of development by the ministry of higher education in Kurdistan universities this project suggestspracticing the principles of biophilic in the existing university campus building. Studies have shown that biophilic surroundings help people feel less anxious, heal faster, have better attention and cognition, and have more positive views (Jim Determan et al., 2019).

The objectives of this project can be described as follows:

•Use innovative thinking, opportunities, and design to improve learning and achievement for university students. Diverse areas have different methods to the

design process, but none of them strays too far from the core purpose of the process, which is to address issues through ordered processes.

•Use these enforced facilities by biophilic design to further researches on the subject, because universities are the core centers of research and development. Although it is impossible to build the ideal room, the space can be strategically utilized based on the task that individuals are expected to complete and the people (age, gender, and culture) that will use the area (Andréa de Paiva, 2018). On the other hand, it is important to remember that spaces do not always affect people in the same way. It cannot be assumed that using architecture; architects will be able to design "the perfect environment," in which all brains will function optimally (Andréa de Paiva, 2018).

•Creating exciting, flexible, healthy, safe, secure, and environmentally sustainable learning environments. Depression and mental health difficulties are the main cause of disability globally, according to the World Health Organization, and since people spend 90% of their time indoors environmental design poses both obstacles and opportunity for designers. In the context of COVID-19, there is heightened concern about indoor settings, as well as a pressing need to create conditions that support mental and physical well-being (Peters & D'Penna, 2020).

•Enhance diversity in universities and create a space that have impact on other aspects of student's life. The architectural environment directly affects the human brain. The physical environment can influence social relationships, focus, cognition, creativity, memory, and well-being (Andréa de Paiva, 2018). Every location, whether natural or man-made, will be processed differently by the brain. Some environmental aspects may be taken as a representation of authority or a hierarchical position, while others may surprise and awe, recall memories, or inspire learning and awareness. (Andréa de Paiva, 2018).

•Seize opportunities through new technologies and applications. Several characteristics of the physical school environment have been related to higher teaching and learning levels. Researchers uncovered a huge number of studies and substantial evidence supporting the benefits of visual connection to nature in university settings. Visual biophilic applications include landscape and green views through windows, nature posters, pictures, murals, indoor plants, the colorgreen, and nature walks, to name a few (Peters & D'Penna, 2020).

•Increase community use of university campuses. To increase the use of existing building and produce more sustainable universities. Self-depended building can provide income to the facility and assists in maintain and sustaining the university campuses.

3. Collaborators

To carry out and implementing this project different sectors and departments willbe required including:

- University council and dean of departments
- University Engineering and project directorate
- University garden directorate
- University financial directorate

4. Theoretical Background

Most of the old studies on Biophilic in the education process, emphasized on theneed to change the study environment from a closed classroom only, to a conduct

study activities outside the classroom (Campanelli, 1997). meanwhile other study applied the biophilic design matrix by linking and integrating the materials that taken from nature and placing them in classroom furniture also the chairs were placed between students at good distances and not too close together, as a result it had positive impact on the students in that they did not feel bored and mentally distracted in the classroom (McGee, Park, Portillo, Bosch, & Swisher, 2019).

on the other hand, there is a study that emphasized the necessity of applying the biophilic thought to individuals, then applying the biophilic to the architectural aspect of universities (Jones, 2012). Moreover another study was reviewed the effect of a winter season and low temperatures on the student's capacity, so the study made use of the direction of the sun's rays as well as the placing of a window against the direction of the strong winds, in order to reduce the impact of low temperatures on the classrooms and on the students' performance (Watchman, Demers, & Potvin, 2020) .

There are many studies on biophilic design, some studies focused on the architectural aspect in terms of the use of biophilic design in the university campus, such as using the materials that have a connection with nature inside theteaching class because it has an impact on the student's psyche and academic performance, likewise the utilizing of colors in the design that attracts attention and the student remains attracted to reading furthermore the employing of nature sounds such as water fountain as well a bird sounds speeds up in the process of returning the student's attention (Terri, & Kristen , 2020) .

Meanwhile, my reading of these two studies, that confirmed the impact of the establishment of a biophilic classroom on the health status of the student by measuring

the students' heartbeat. The study confirmed the classroom designed in a biophilic way very much reduce the level of the heart rate as it is within the normal limit and the student is not exposed to psychological pressures (Determan, Akers, Albright, Browning, Martin-Dunlop, Archibald, & Caruolo, 2019) as a result the student is not exposed to nervous and psychological pressure, whateverthe condition of the classroom (Ebbini, 2021).

Relying on the previous studies, we conducted this study for Raparin Universityon the application of the biophilic to the classroom as the corridors, an attempt tomodify the existing teaching halls to the biophilic design as well as increasing thecompetency of the students.

5. University of Raparin as a case study

Raparin university is a public university which is in Ranya in the Kurdistan region of Iraq. The University was established in 2011 and includes: five colleges including a biology department; a faculty of education; a nursing school; engineering college, basic education and humanities sciences. Its name came from the kurdish Uprising that started in the Raniya district for the first time on 5March 1991.

The masterplan of the Raparin campus was designed in 2014. Only a few buildings have been constructed due to the financial crisis. Most of the campus masterplan will be constructed in future. The university consists of four major zones including 1. Educational (Engineering Faculties, Theoretical Faculties and Medical Faculties); 2. Cultural (Conference Center); 3. Residential (Students' Housing, Sports Fields and Staff Housing). 4. Administrational buildings.

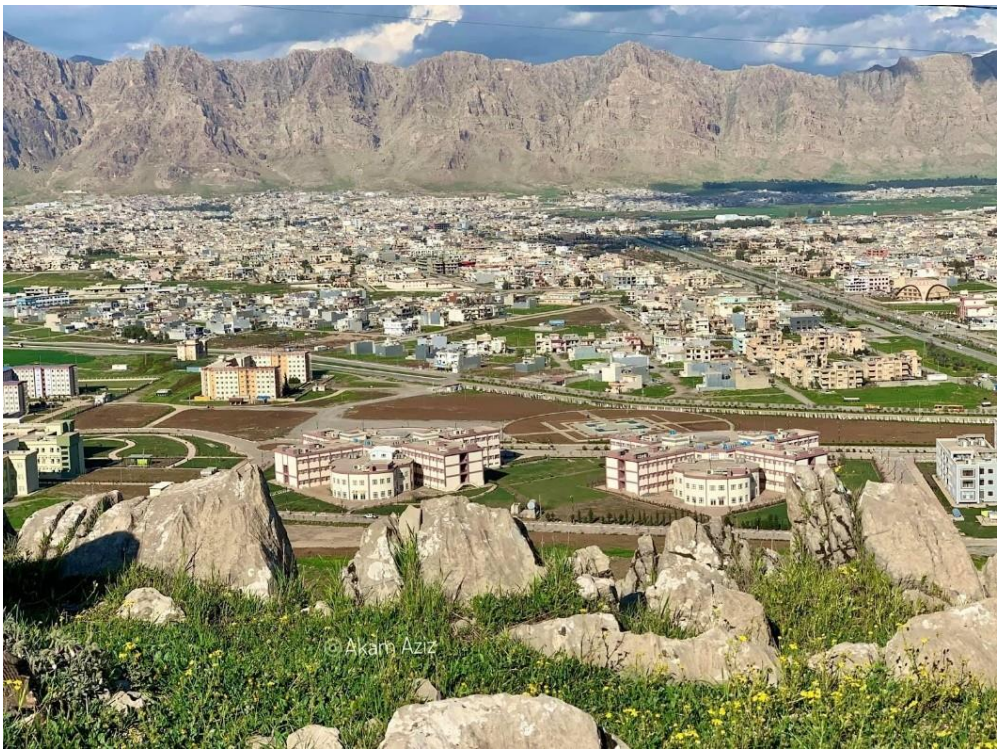


Figure 1 Rania city

Figure 2 Master plan of university of Raparin

6. Project implementation plan

The university campus can be called a community or neighbourhood because of the variety of sizes and quality of buildings and areas. Implementation of Biophilic should not be limited to classrooms or other learning environments because of having many other connections and activities that affect campus quality of life. Designers should consider designing transition spaces between university classes and buildings and the natural environment. The impact and beneficial features of biophilic design elements isolated in specific parts of a university campus will be reduced. Designers must realise that biophilic design works to bring natural experiences in the built environment.

Universities have a wide range of places and activities including lecture halls, classrooms, study rooms, and libraries, recreational spaces, and student dormitories, centre courtyards, university landscapes, and social spaces. As wellas the university has a diverse population on campus including professors, researchers, staff, and students. The types of spaces, as well as how and whenthey are used, are influenced by the university users.

• Biophilic design achievement

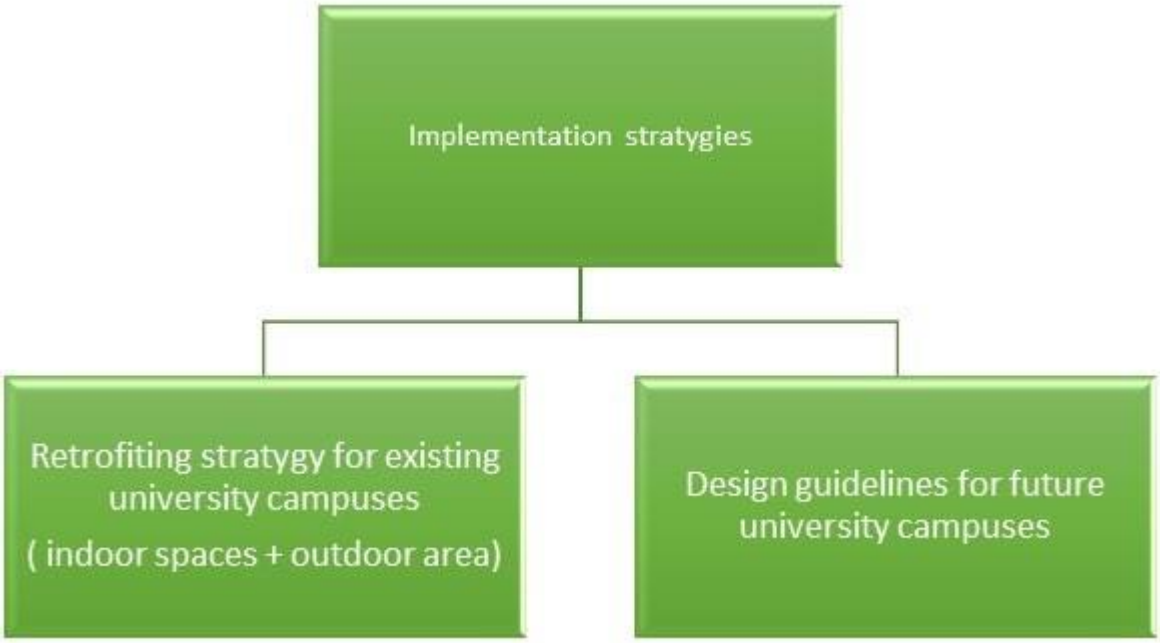
Biophilic principles could be achieved by following methods

1. **Direct connection:** this type can be achieved by having direct access to living natura elements such as garden, rooftop garden, nature walk, courtyard garden, natural light, living green wall or plant.
2. **Indirect or visual connection:** this type can be achieved by having non-living natural elements such as nature image, colours (green, blue, yellow), window view, natural materials (wood, ornamental stone).

- **Implementation strategies in this project**

Two different strategies being carried out to implement and achieving biophilicprinciples in university campus. These are

1. Retrofitting strategy for existing campus
2. Design guidelines for future campus as shown in the following diagram.



First: Retrofitting strategies

University of Raparin as a case study and it is more likely represented as a typical university in Kurdistan particularly at designing indoor spaces such as classes. although Raparin university has a plenty of amazing landscape, it still has many problems at indoor spaces.

- **Problems with existing campus**

1. Lack of the connection between exterior landscape (natural elements) and indoor spaces (classes, corridors, staff room).

2. Lack of the natural elements in indoor spaces**.**

- **Proposed biophilic element to Raparin university**
  1. Repainting indoor walls of classes, corridors, library, and staff rooms by natural colours pallets such as green.
  2. Providing printed of large-scale nature graphics for classes.
  3. Providing living green or simulated walls and living plants for indoor corridors.
  4. Providing living plants and grass for courtyards.
  5. Providing window view to outdoor nature elements

- **Preliminary bill of quantity for proposed biophilic elements**

No.	Item	Unit	Quantity	Cost (IQD)
1	Repainting indoor walls of classes, corridors, library, and staff rooms by natural colours pallets such as green	M2	1	3500
2	Providing printed of large-scale nature graphics for classes.	M2	6	150,000
3	Providing living plants for indoor corridors	unit	1	50,000
4	Providing living green walls	M2	1	150,000
5	Providing simulated green walls	M2	1	50,000

Second: Biophilic design guideline for future universitycampuses

1. Providing green outdoor spaces for learning
2. Consider Transition Spaces Between Indoor and Outdoor Environments.
3. Taking into consideration of the positioning, Size, and Orientation of Buildings and Classrooms for Views
4. Windows should be provided for all Classrooms and Offices either from exterior façade of the building or atrium.
5. Providing natural daylight and shading device to optimize the daylight.
6. Using natural patterns to provide visual simulation of connecting nature such as green wall covering and furniture patterns.
7. Using natural materials in the class such as wood furniture
8. Providing proper outdoor landscape
9. Using the Biomorphic Forms: Natural patterns and shapes have long been employed in architecture, and they can inspire, provide comfort, and increase one's connection to nature.

Figure 3 Raparin university landscape (disconnected with indoor spaces)

Figure 4 Raparin university landscape (disconnected with indoor spaces)

Figure 5 Raparin university class (Lack of indoor natural element and lack of outdoor connection)

Figure 6 Raparin university corridor (Lack of indoor natural element and lack of outdoor connection

Figure 7 Presidency of Raparin university courtyard (lack of natural element)

Figure 8 painting class wall by green colour

Figure 9 using a printed large-scale nature graphic on class wall

Figure 10 using green wall at corridors

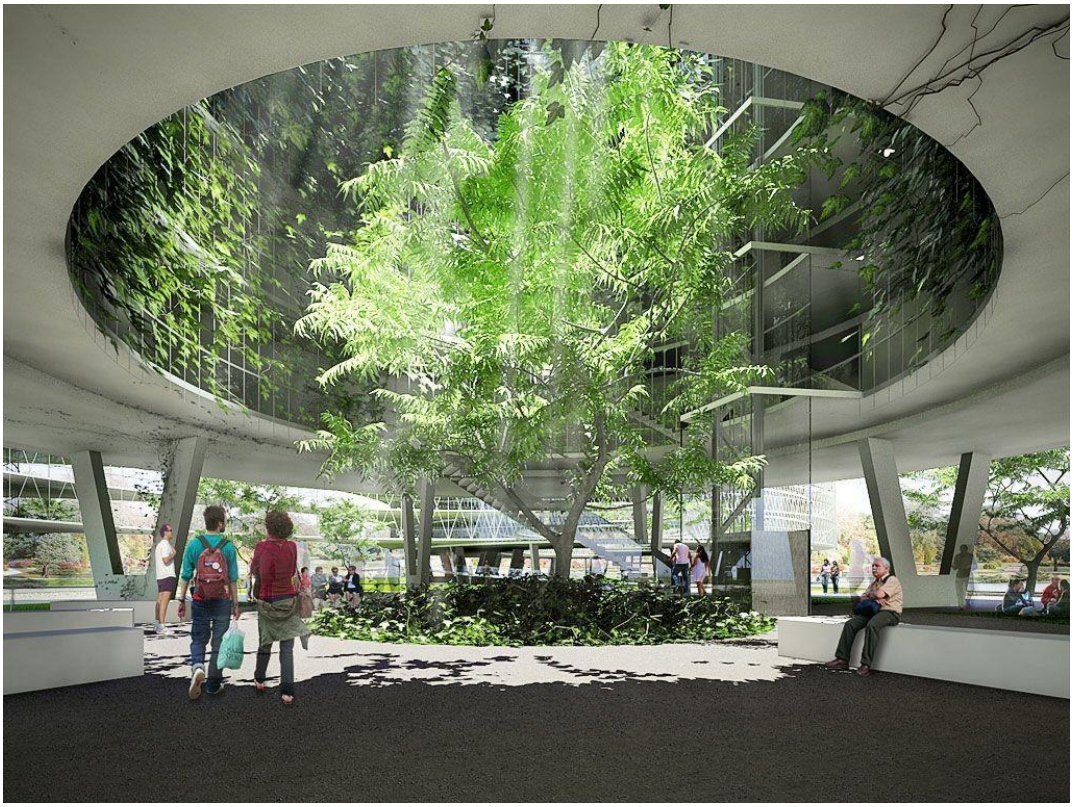


Figure 11 Providing living plants at courtyards

Figure 12 Providing window view to outdoor nature

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