



In Pursuit of Identifying Urban Well Being through Built Environment: A Case Study of Abbottabad City

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ABSTRACT

Uncontrolled urbanization has harmfully affected the physical environment, the structure of cities, and, therefore, people's physical and mental well-being. The strong link between mental health, well-being, and architecture needs consideration. This paper attempts to identify factors that make places well-being and design interventions to improve or create well-being. For this research, field surveys, questionnaires, and observations were conducted in the public areas of Abbottabad, Pakistan. All the indicators of a well-being city, either weak or strong, highlighted in the built environment are based on the research-based designed questionnaire marked by the residents of Abbottabad. These deliberations and crafted skills etc are conventional to become valuable tools for future urban designers, architects, and urban planners, as they objectify to augment and articulate user's positive experientialism and set forth the urban- scope and city's contoured silhouette's policies for liveability and well-being of cities in future design.

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1. Introduction

In the past four decades, significant urbanization has enhanced both size and number of cities. Increasing urbanization has boosted the country towards better living conditions, such as growth opportunities for jobs and a safer living environment in terms of public services. However, urbanization has also caused negative impacts on the urban well-being, such as traffic problems and pollution. So, the effect of urbanization on the well-being of the citizens is paradoxical (Veenhoven, 2021). Urban life depends on public squares, parks, streets, roads, and pedestrian pathways because open spaces are responsible for mental, emotional, and ecological health as they provide peace of mind and a clean environment (Samavati & Ranjbar, 2019). Deciding whether an area is worth living in or not, it is based on many factors and indicators that can be tangible or intangible such as the design quality, the identity of the place, and accessibility. Urban well-being refers to '*The ability to satisfy people through urban well-being*' (Sepe, 2017). The standard is not only based on aesthetic and geometrical characteristics, but fundamental and elemental representations relating to the meaningful urban well-being are also included (Kim & Jin, 2018).

The design indicators (Accessibility, Greenery, social interaction, amenities, etc.) also fluctuate with the fluctuation in the social structure (Zandieh, Nieuwenhuijsen, & Zandieh, 2020). As social values (financial Status, education, relationships) confront a shift in the meaning of well-being, urban well-being also changes based on these patterns (Amoretti, 2018). The definition of urban well-being is intertwined with social, behavioral, psychological,

ecological, and economic studies, which follow new trends in the lifestyle and requirements of the people. Based on this perspective, it is safe to say that the philosophy of urban well-being is in continuous change (Wang, Jing, Zhang, & Zhao, 2009). Scholars have recently been interested in individual subjective well-being. This broad context includes physical, psychological, and social metrics that can be used to evaluate the effect of public goods, especially urban parks (Liao, Warner, & Homsy, 2020). Furthermore, many planning researchers have stressed that green spaces and urban parks contribute to residents' satisfaction. Urban parks enhance people's subjective well-being by offering substantial physiological and psychological benefits (Liao et al., 2020).

Public spaces might prove it to be most viable platform to study and analyze urban regenerative strategies primarily with the reason of possessing excellent potentiality to uplift and add value to the urban well-being of the potential residents and users. The vitality and need for aversion of depreciation in the planning procedures can be achieved through utilizing the experiential phenomena, opinion polls and the ideas linked to residents and users of a particular urban habitat. This would be critical in ensuring the rejuvenating of public spaces in the urban domain. Envisioning the intricacy to the feeling of inhabitants, their safety protocols perceptibility and the sense of analyzing the ambiance relevant to the public spaces' existent within the peripheral urban catalogue canvas. This shall act as a crucial shareholding in decision making procedures coherent to the domain of urban planning, design, and its architectonics. Moreover, subjective well-being of inhabitants is still the most important query, but unfortunately having short of information regarding the matter under discussion (Sepe, 2017). Emotional examination of inhabitants in conjunction to variable attributes of urban built environment is the question that remained mostly unaddressed by maximum research scientists. The perceptibility towards urban security is the prime influential key for inhabitant's and user's emotional state (Madanipour, Knierbein, & Degros, 2013), foliage and entourage with lush green plantation erecting sensual dichotomies such as Patios (Daniëls, 1991), or genius loci which is historical significance for urban identity (Habtour, 2016).

Diversified vistas and avenues are inevitable in formulating research opportunities, to objectively attain a very clear understanding of the attributes one to all, regarding subjective wellbeing of inhabitants, user, and people. Despite of being labeled as theoretical quantitative research and survey analysis, urban well-being is attaining great recognition and got acclaimed in number of aspects of the project (Wang et al., 2009). The plethora of information from multidisciplinary fields of social sciences, environmental science and engineering, philosophical science and studies, is articulated and well knitted with the conceptual idea of urban well-being. The highest level of sensitivity towards intense transformation of needs, habits and behaviors shall persistently evolve. The love, passion, impression of a place, the affection to live in a particular urban area for longer periods of time and experiencing the experience stated above again shall signify the manifestation of city's well-being or contentment for an urban area. This paper is an attempt and effort to understand the user's perspective in evolving and formulating the places as well-being. The place mapping project of well-being is aimed to recognize the factors involved in the process. Surveys, observations, analysis, and QGIS are used in this process.

1.1 Well-being City Design Indicators

Environmental factors affecting Urban well-being are divided into restorative and interactive categories (Fig 1). The therapeutic factors include nature, light, and surprise. Access, identity, and sociality are the interactive factors.

Figure 1: Environmental factors affecting Urban well-being (Charles, 2013)



1.2 Urban well-being indicators

Following are the designed based indicators for an urban wellbeing. The research concludes with six environmental factors that affect human well-being.

1.2.1 Nature

Increasing interaction with nature is a way of improving it.

1.2.2 Light

Our internal circadian rhythms are assisted by natural light cycles, raise our serotonin levels, and become necessary for good health and well-being. It may lead to depression, sleep disorders, and other diseases if there is too little daylight for too long. A sign of hope and promise is the rainbow. The literal source of life is light. How we filter light may give the spaces we inhabit unique significance.

1.2.3 Surprise

When surprised by something good, the brain's pleasure centers light up; when a pleasant thing comes before a person, more pleasure centers light up. A great way to react to this idea is to incorporate moments of impractical beauty and fun into design work—individuals who consider their beautiful city report a high level of well-being.

1.2.4 Access

Access to the basics, such as food, health, and banking services, is essential.

1.2.5 Identity

People anchor their feelings in places where they live, particularly places where they have shared their experiences with others. To spaces of quality, cultural and unique people are linked. Connections to areas can become essential elements of your identity, and a good sense of self is a characteristic of a well-being individual. A good indicator of well-being is the relation to place. People form emotional attachments to physical locations that can give those places a sense of joy.

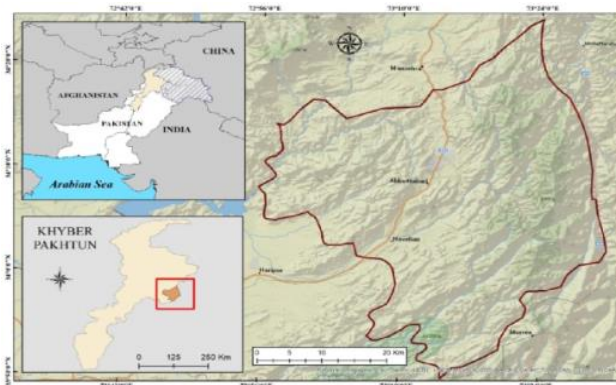
1.2.6 Sociality

How much you trust others correlates directly with your well-being. And the building of trust works better face to face. It means planning and design not only with partners, families, and close friends but also with neighbors and work colleagues. We must establish spaces and opportunities for individuals to feel comfortable connecting and developing trusting relationships. Without the added pressure you get from your more serious relationships, friendly interactions with people you meet on the street will boost positive oxytocin.

1.3 Study Area (Abbottabad City)

Located in the east of Khyber PakhtunKhwa (KPK) province of Pakistan, the district of Abbottabad is a significant part of the Hazara division. It is situated at 34 degrees 9 '21' North and 73 degrees 13 '10' east at the base of the Himalayan estate, with a total area of 1.967 square kilometers.

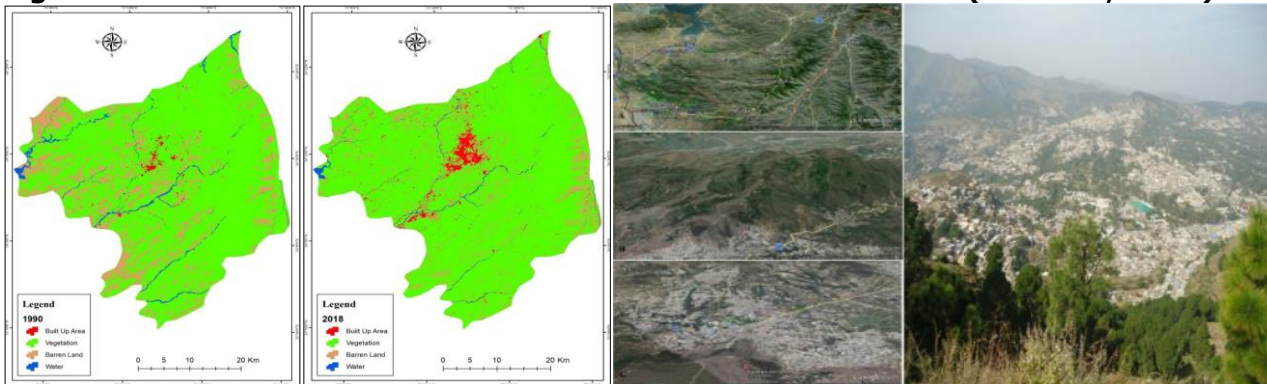
Figure 2: Study Area Map. (Fujiwara et al., 2020)



1.4 Urbanization

The population of Abbottabad has increased in recent years due to the developments made in the city. The movement of people to the area and the growing need for accommodation have changed the land use pattern and increased the ecosystem issues. Furthermore, 2005 seismic activity also caused land use changes, as people moved from rural to urban areas to build new houses (Gerstenberger et al., 2020).

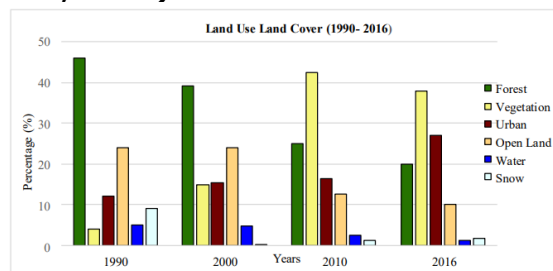
Figure 3: Left: Land use land cover Classification 1990 and 2018(Miandad, 2020)



1.5 Right: Urbanization of the city through an aerial view

In 1990, satellite imaging analysis showed that 81 percent of the area of Abbottabad consisted of vegetation cover. The developed area was 1.3 percent. Reduction in vegetation area implies the events of deforestation and barrenness of the land due to excessive forest and wood fuel use.

Figure 4: Along KKH (Barira, 2016)



Urbanization has upgraded Abbottabad's Status from a town to a developed city on its way toward expansion and further advancement. Karakoram Highway (KKH) is a vital part of the city because all the public and commercial places are built along the road. From June to September, Abbottabad becomes tourist-centered as people come to enjoy the scenic beauty and the pleasant weather in the summer. However, winter tourism in public spaces declines due to the harsh climate. Hence, surveys were conducted during peak hours (5pm-10pm) in August 2019 for two weeks. For this research, three sites have been selected on the Karakoram Highway: Jadoon Plaza, the City Center of Abbottabad located in Bilal Plaza, and the Lady Garden (Fig 5). These sites were chosen because an initial field survey exhibited maximum flux at these three locations.

Abbottabad is a city with diversity in urban patterns and culture. This research is centered on the urban ways following residents' well-being. The emphasis of this study lies in analyzing the elements of the city's public spaces (built environment) that aid the citizens' enjoyment. Some questions tap into the previous research are what factors determine urban well-being in a city, how can the built environment, urban design, and architecture affect the well-being of a city, and what are the advanced geospatial methods for analyzing urban well-being. The primary objective of this research was to study existing parameters for the measurement of urban well-being, which made the research more systematic and easily organized. To build criteria for analysis of urban well-being in the built environment based on previous studies and measure the urban satisfaction of Abbottabad city based on the analysis criteria both through field surveys and interviews.

Figure 5: Study areas on Karakoram Highway Abbottabad (Source: Author)



2. Methodology

The methodology consists of the following phases:

- A field survey for data collection
- QGIS database assembly and record analysis

Based on structured research indicators, data collection from sites is done through observation and analysis. And assemble through the QGIS database. After assessing site conditions and summing up study indicators, with the help of QGIS, a graphical representation of a descriptive survey from selected sites. A field survey was conducted in the region to determine city well-being; interviews work with several participants.

3. Analysis

The analyses of the three chosen sites in support of positive features of urban well-being are conducted according to six critical factors mentioned earlier: nature, light, surprise, access, identity and sociality.

3.1 Nature

3.1.1 Jadoon Plaza

Jadoon plaza is where residents of all ages, genders, races, and classes come together. Green places serve as areas for get-togethers. The site presents a connection between empty lots and buildings. Nature in such places can influence the surrounding environment if public places intervene. Community engagement can be enhanced positively if accessibility is provided to these public places. The parking spaces along the road inside Jadoon plaza phase 1 and 2 aid the tourists visiting the area.

The context of the Jadoon plaza has green patches, as shown in figure 7; during peak hours, when the plaza becomes overcrowded, the green area adjacent to the Jadoon plaza is used for outdoor dining. On the other hand, the Burn Hall green area has shadow trees on the roadside in front of Jadoon Plaza. This is advantageous for visitors who wait for public transportation. The maple trees in the front view of both Jadoon plaza phases enable the people to enjoy the site and bring an element of refreshment (Figure 7). The water element is not observed in both phases; there is no designed fountain for public attraction to the site's beauty or to add a point of interest for the public. Both phases of the Jadoon plaza are not intended as enclosed spaces, so it is open air space for wind and sunlight (Figure 8).

Figure 6: Jadoon Plaza context, interior view indicated by black arrow (From this point the above picture is taken) (below) contextual green patches mentioned in the map



Figure 7: Interior view of parking and road of Jadoon Plaza Street light in Ferdinand VII style indicated as a yellow dot on the map



Figure 8: Jadoon Plaza's front view is in the West direction of the building



3.1.2 Light

Unobstructed exposure to the natural light in Jadoon Plaza provides visitors an opportunity to experience light and warmth in the winter, making this a tourist attraction. While in the summer, in the Jadoon plaza, both buildings cast shadows which visitors utilize as a shaded area during daytime. There are street poles in golden light for nighttime for the feasibility of visitors. Both phases of Jadoon plaza are a breeze and openly designed, meaning there is no dark space or dead space at corners. All areas are well ventilated and naturally lighted, as shown below. Both the phases are the ground and the first floor, suitable for sunlight and air.

Figure 9: Jadoon Plaza 3D view and plan



3.1.3 Surprise

The artistic features added to the plaza entrance are considered as delight elements having a pleasing effect on the visitors. Pakistan Military Academy (PMA) is located near Jadoon, which adds to the monumental scale of the area. The horse statue at the plaza signifies the site's context as a community place. Landmarks provide a room with a more straightforward orientation, giving the visitors a sense of relaxation.

Figure 10: Detailed Elements of Jadoon Plaza



(a) Sculpture at entrance

(b) Outdoor Street light in Ferdinand VII style

In figure 10, Light poles at night enhance aesthetic value to the site and provide artistic beauty to the space, increasing the environmental positivity. They are designed aesthetically in

London-style post lamps. They add a beautiful ambiance to the night time space with golden lights. It adds beauty and an element of attraction to the area at night.

3.1.4 Access

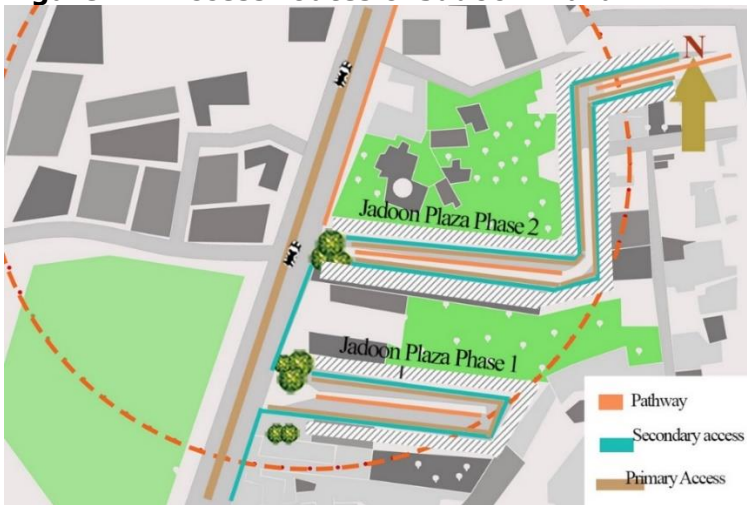
The easy access to the plaza is from the direct route of KKH or the second pathway from the missile chowk, as exhibited in the picture above. Overall, the area is considered walkable because it has pretty urban solid edges; however, public traffic services are everywhere in the city.

Figure 11: Access routes of Jadoon Plaza



With all the basic facilities present in it, such as food restaurants, prayer arrangements, and parking in its internal structure, Jadoon catches the attraction of the visitors. The parking road is constructed in a loop form, providing visitors food access.

Figure 12: Access routes of Jadoon Plaza



3.1.5 Identity

The most iconic building in the context of Jadoon is the Army burn hall, established in 1943 by Saint Joseph's Missionary Society of Mill Hill (MHM). Historic fabrics lay deeper emotional foundations in the city of Abbottabad. The architecture of the city is authentic to the present yet brings nostalgia by connecting people to the past. The building was constructed in colonial style. A gable roof is the main feature of British architecture. This building is built with red brick, which is the traditional material of Abbottabad. The top has dormer windows for sunlight, as the prominent element of this building. This approach allows this building to be very distinctive while also complementing the surrounding context's size and materiality

Figure 13: Historical building in the Jadoon Plaza context



Figure 14: Burn Hall front elevation



3.1.6 Sociality

The strategy was implemented within the Jadoon Plaza to create multiple options for flowing around the space and a range of places apart for people to relax, connect, and engage in conversations. Jadoon has two types of areas for social gathering.

Figure 15: Social Gathering areas at Jadoon Plaza



At night, the light pole becomes the center of the seating arrangement for people to gather. Mostly, after shopping, people take their food and sit there.

3.2 City Center

3.2.1 Nature

As a center for shopping, it is an attraction for all genders, races, and communities but cannot be used for get-togethers due to the absence of green spaces.

Figure 16: Location of City Center on KKH of Abbottabad map Source: Google Earth



There are no proper food cafes in the city center. The hawkers stand outside the plaza on the roadside and sell food. Visitors buy food from these hawkers. There is no proper sitting space for visitors to enjoy their food; they used to sit in their cars (Figure 16).

Figure 17: City Center context and Exterior perspective of the city center view taken from the direction mentioned in the orange arrow



The area is commercial, and there is hustle due to school, bank, and communal areas around the place.

Figure 18: City Center Section (West side of the building)



The basement area is used for commercial purposes. This space has no green places and has a low natural light aspect.

3.2.2 Light

Due to the columns at the front, the city center exhibits a closed structure that does not allow natural light to enter, causing a decline in visitors in the winter season. See figure 19; the orange color indicates the location of columns. Unlike Jadoon, the light intensity inside the place is low. The corridor transitions between shops and outdoor spaces, causing a blockage of light.

Figure 19: City Center front view Elevation and plan



3.2.3 Surprise

The city center's unique feature of vibrant colors and columns at the front of the facade adds to its beauty. This specific public zone attracts visitors by its unique architectural design, vibrant colors, and differential materials.

Figure 20: City Center Front view



Figure 21: Night view of the city center



A light display, to create a visually endearing surprise moment in the urban environment, gives people an urge to inhabit the sites at night and makes them feel engaged and secure. In the façade of the city center, columns are designed that are relevant to the historical colonial architecture of the city but also add something new among the modern style buildings in the immediate surroundings. The semi-covered veranda running at the front of the building offers a different experience from the otherwise fully enclosed modern facilities.

3.2.4 Access

The city center has a single access route that is from KKH. It is a commercial hub on both sides of the KKH Plazas. It is a two-way road in front of the city center, but the issue faced by the visitors during the visit to this site is U-turn being 3 km away from the site, as

presented upon the map with a red arrow. A further 3km drive is required to be on the other side, which is a hindrance for the visitors.

Figure 22: Access routes of City Center



The city center is one of the most successful shopping places in the city. Well-established and local brands are marching towards the city center to enhance their businesses because it has easy public accessibility. Also, it has all the basics of an ideal public place, such as food, toilets, banking, parking, and seating arrangements for the public.

3.2.5 Identity

The city center has an enriched context. In front of this building is a commercial building called Kashmir mall and Bilal Plaza, mentioned with red arrows on the map. Both are well known in the city for their modern style and building material. These buildings are in contrast to the city center. The city center is a double-floor building compared to Kashmir mall and Bilal Plaza. Kashmir mall and Bilal Plaza are more than four-floor buildings; the style is considered contemporary. Because of this characteristic, they are prominent in the context of the city center.

Figure 23: Important contextual buildings in the City center

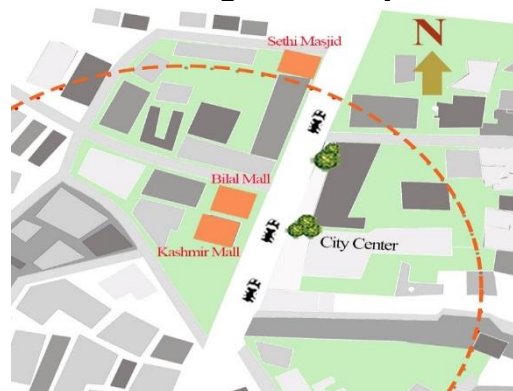


Figure 24: City Center contextual buildings Left: Kashmir mall. Right: Bilal Plaza



As an example of the amalgamation of both Islamic and modern architecture, Sethi masjid is one of a kind. It contains minarets and pillars, but there is no fencing or any ornamentation in the Elevation. There also is no dome and portal in the whole infrastructure.

Figure 25: Sethi mosque near City Center



3.2.6 Sociality

The city center has no specifically designed sitting area for social get-togethers, but food vendors are commonly present outside the city center. People use this space for relaxation and gathering. Social interactions on the urban level in more walkable and mixed-use locations are essential. The connection between satisfaction and facility access is also significant, such as food corners, areas for relaxation, and concert halls. Such aspects of the built environment affect social connections important for well-being and likely relations to the site.

Figure 26: Gathering points at the City center



3.3 Lady Garden

3.3.1 Nature

This public place is used for family gatherings because it has specified areas for families. The tree cover in the region serves the purpose of privacy and provides a healthy environment in the busy city. The facilitated parking area is mentioned in Fig 28 as blue, which is at the entrance of the lady garden. This area is 0.258 acres.

Figure 27: location of Lady Garden on KKH of Abbottabad map



The trees hold historical importance because they were present in Abbottabad from British rule.

Figure 28: Lady Garden context: Front View at NorthWest direction of the plan



Despite its busy context, the Lady Garden is adding to the aesthetics of the city while providing visitors with refreshments due to its enhanced foliage.

Figure 29: Lady Garden contextual view



The natural value is enhanced with pine, maple and palm trees adding to the cover. Such an addition to the natural environment enables people to connect with the landscapes more meaningfully. The Lady Garden adds the water element by designing a fountain with the vernacular material of Abbottabad city: stones. The fountain not only adds beauty and nature to the space but also gives water facility to the birds, as shown in Figure 29. The garden is designed, so visitors get maximum sunlight in the cold winters of Abbottabad.

3.3.2 Light

Situated in the Kehal area, citizens approach the lady garden for the winter sun, but the trees shed leaves in the winter and provide natural shade in the summer. The flux of people remains constant in both seasons.

Figure 30: Left: Lady Garden plan Right: Gazebo in Lady Garden



The park's north side has a female area covered for privacy by trees. These trees provide privacy not only from the male side but also from the side attached to the main KKH. It is suitable for summer as this place is breeze and cold, but in winter, this park area is much more relaxed and has no sunlight. Hence female visitors face the issue of the sun in winter. The male or family area of the part is on the west side of the plan, which is open to the sky but has shade areas under trees as well as designed gazebos for sunlight protection in summer, as shown in Figure 31 (Right). At night, there are electric poles for those visitors who used tracks for running.

3.3.3 Surprise

The Lady Gardens beautify the city by adding positivity to the environment. Adding narratives to the places (such as colors, texture, and elements) also significantly impacts a place's perception of interest and aesthetics, suggesting that aesthetics can be related to one's emotional links with the places.

Figure 31: Detailed sitting area around trees



The pebbles are arranged around the trees so that they become a sitting arrangement without harming the tree, giving people a sense that they are close to nature.

Figure 32: Detailed urban beauty of Lady Garden



Left: Fountain at Lady Garden Right: Artificially designed water body having a fountain in Lady Garden

Adding the elements of art also adds to the overall interaction of the visitors. A fountain made of stones in the garden catches visitors attraction because it is a visually pleasing piece of work see figure 32. As a therapeutic part of the design, green additions can promote creativity and interest in the sight. Visual marks play an important role in orienting the tourist to be at ease.

Figure 33: Detailed urban furniture of Lady Garden

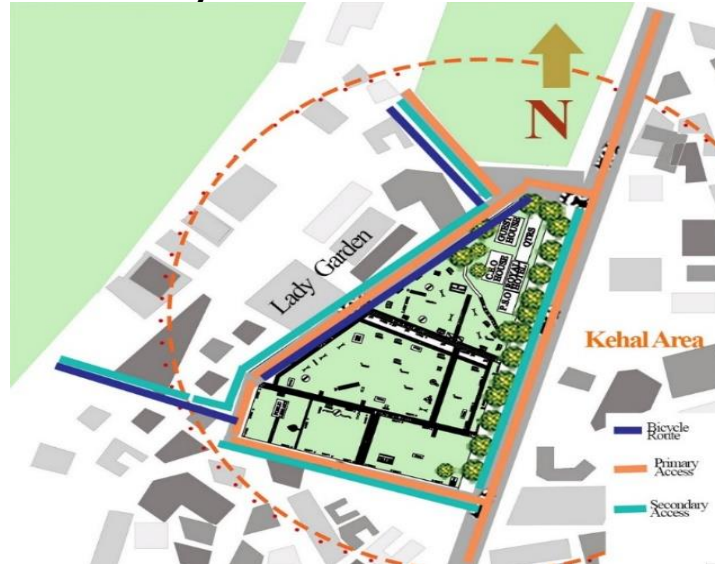


The presence of gazebos and bridges also adds to the surprise element of the lady garden see figure 34. Our sensory organs engage with the environment positively when subjected to music, flowers, art, water, and rocks.

3.3.4 Access

It has public accessibility from all four sides and is connected with the Cantt Bazar, the city's main bazaar. For the residents, there are pedestrian pathways designed explicitly for walkers and visitor-specific parking areas at the entrance.

Figure 34: Access routes to Lady Garden



One lane containing a buffer that gives cycling space narrows pedestrian crossings and slows the traffic down. This site is adjacent to the public transport stop. That makes it well placed for the people who are willing to utilize the public transport system of Abbottabad.

3.3.5 Identity

Squash complex (mentioned with an orange arrow) and Kakul (mentioned in the map) act as an identity for the lady garden. Kakul is a military academy built on British architectural design, and its building holds national importance. Red bricks are the building material built-in British architecture for the Junshar khan squash complex. Near the Lady's Garden is the Kakul Academy Mosque. Through its architecture, this mosque captures a visitor's attention. This mosque is built with marble, a dome, columns, arches, a minaret, and a courtyard. Both buildings provide the city with giving the visitors a nostalgic feel whenever they visit the lady garden. Hopefully, it is an active area at night and during the day.

Figure 35: Famous Lady garden contextual buildings

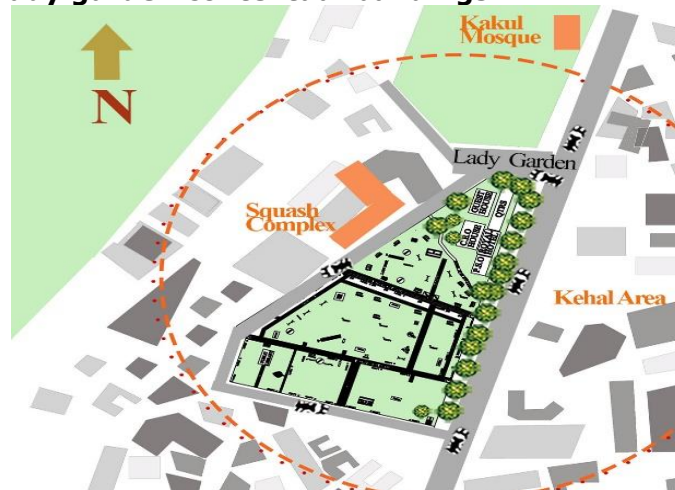


Figure 36: Lady Garden contextual buildings Left: Squash Complex Right: Kakul Mosque



3.3.6 Sociality

This place is located at the threshold of many social layers. To provide several options to flow through space and various places for people to rest, hang out, and talk.

Figure 37: Gathering point for socialization at Lady Garden



It has multiple spaces for social get-togethers, including the cafeteria, a sitting area under the designed gazebos, a sitting place designed around trees, and an area around the fountain for sitting. All these spaces provide numerous opportunities to visitors for social arrangements.

Figure 38: Internal Details of Lady Garden for social gathering



Lady garden seating prompts social interaction with people. These rocking street benches around trees, which enable users to connect, are inventive methods to create urban furniture.

4. Findings and Conclusion

The research presents the impact of the built environment on the well-being of urban people through urban design analysis. It gives the idea that a physical space can provide an individual with a positive feeling of well-being. Previous literature stated that physical stimulus impacts one's well-being and satisfaction along with the design strategies, which also affect the individual's well-being. Previous research shows the design strategies and well-being indicators of the "Urban Design for Well-being." The research aimed to study existing parameters for the measurement of urban well-being, to build criteria for the analysis of urban well-being in the built environment based on previous studies, and the urban well-being of Abbottabad city based on the analysis criteria. The design strategy is analyzed through observation and people's perceptions. The research paper denotes the physical impact of

urban residents' satisfaction through the construction environment on the scale of urban architecture.

The results illustrate how physical stimuli impact pleasure in an urban setting and how services such as Public Park or Public squares are established to increase the quality of the urban environment. Current residents are more expressive, socially connected, and culturally rich than in their past city. They have built trust in each other by helping each other. They brought an emotional value to the area by celebrating holidays and religious events in public spaces, giving them nostalgia related to the city. Places like Lady Garden are still enjoyable to visit. During the research, citizens want more general areas in their study and pavements and cycling tracks. They desire to celebrate those public spaces connected to emotional attachments from their childhood. This research observes that urban areas' well-being indicators are based on citizens' culture and city typology.

The "Urban Design for Well-being Indicators" is meant to become adaptable tools for administration, practice, and research to guide the improvement or creation of well-being that the urban design project will bring in the future. Based on this research, these indicators and strategies will become reference tools for urban designers, architects, and urban planners, as they will aim to design positive user experiences and, in future planning and design, to set city-shaping well-being policy.

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