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Review

A Study on Transformation of Housing Typology and Its Environmental and Social Effects on the Living Conditions of Residents in Planned Residential Neighborhoods of Kabul City

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Abstract: This study examines the transformation in housing typology from low-rise to apartment buildings in the formal neighborhood of Kabul city. These formal neighborhoods were developed according to plans from 1978. The majority of these neighborhoods were designed with detached houses that had courtyards. Literature reviews, field visits, opinions of residents, and a planning organization provided data for this study. In this study, the transformation of housing in planned neighborhoods is analyzed in relation to their social and environmental impacts. Researchers determined how varying housing typologies affected residents' health and quality of life in these planned neighborhoods. Initially, we assessed the physical characteristics of the study area and evaluated how much transformation volume is present in the study area. Second, we examined residents' views of residential development and its impacts, as well as their daily lives. In order to identify the relationship between these two aspects, the study examined the characteristics of the area (variables) from the perspectives of privacy, natural light, shading, sound pollution, air pollution, and energy use. We used several criteria to evaluate the accuracy of the physical characteristics and the respondents' opinions. Lastly, we provided some recommendations and solutions to improve the current situation.

Keywords: detached houses; apartment building; transformation; environmental impact; social impact; health

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1. Introduction

1.1. Background

Housing is one of the most important needs for human existence, along with food, enabling us to satisfy our basic needs for work, life, and recreation [1,2]. It is widely acknowledged that housing is one of the most fundamental societal needs, affecting a person's health, happiness, and productivity in many ways [3]. Housing is an exemplary expression of prosperity for a society and a determinant of health and wellbeing [4]. It is imperative that housing protects the self-esteem and value of human existence. While its importance cannot be underestimated, inadequacies in the supply are evident in many developing countries. In the world today, major demographic and socio-economic changes, technological advancements, and socio-political interventions have been instrumental in housing transformation [5–8]. In cities that have become centers of power, extensive development and exposure to more advanced urban development techniques led to the emergence of distinct trends [9]. Eventually, cities expand beyond their legal boundaries and their peripheries, violating the rules in order to accommodate rising populations [10,11]. Responding to the needs of urban populations presents a number of challenges, whether in terms of housing, transportation, energy systems, infrastructure, employment, or basic services. A residential structure generates a variety of externalities throughout its life cycle, and it has a significant environmental footprint [12]. After a structure is built, it continues to have environmental impacts through energy and water consumption, as

well as waste and sewerage generation. The impacts can be realized through land and material consumption, energy consumption, and transportation activity. As a result, urban residents are exposed to a variety of environmental and social issues and problems [13–16]. The relationship between housing and the health of the public has become more diffuse. Housing remains a key social determinant of health [17]. The urban environment generates substantial amounts of waste, most of which remains unmanaged and becomes harmful to the health of people and ecosystems. Air pollution is a critical environmental concern and is responsible for 9% of global deaths and a variety of health problems [18]. Meanwhile, noise pollution is emerging as another major environmental hazard to public health. Constant exposure to loud noise has been linked to high blood pressure, sympathetic nervous system activation, and the release of unbalanced hormones [19,20]. As an environmental factor, ventilation has the potential to significantly improve urban air quality. However, reduced ventilation rates have been linked to respiratory infections in infants, as well as asthma and allergic symptoms in adults and children [21–23]. Similarly, residential buildings generate social issues that contribute to health problems as well. Crowding has been linked to psychological distress in women [24]. Homelessness and living in substandard, temporary housing have been linked to behavioral problems among children [25]. Poor housing conditions may lead to social isolation because occupants are hesitant to invite guests into their houses. Moreover, since high-rise buildings lack common areas, they can inhibit social interaction [26]. Substandard housing, therefore, plays a significant role in undermining human health. Therefore, housing is an important determinant of health, and substandard housing is a major public health issue [27–33]. The aforementioned problems are causing living conditions to deteriorate day by day.

Living conditions and health are topics that health researchers, policymakers, and the general public are all interested in. Living conditions are fundamental social determinants of health, according to an increasing number of studies [34]. The quality of living conditions has a significant impact on the health of residents. Physical and mental health are affected directly or indirectly by living conditions [35]. Infectious diseases, chronic diseases, nutritional deficiencies, and mental health problems can all spread due to poor living conditions [36,37]. Many studies have found that worsening living conditions have a negative impact on occupants' health. Foster (1992) investigated the high living density in rapidly growing cities as a possible cause of epidemics such as plague [38]. Ineichen, 1993, investigated the relationship between housing conditions such as overcrowding or poor hygiene and diseases such as tuberculosis in the United Kingdom [39]. Lowry, 1991 also investigates the relationship between population health and housing [40]. Meanwhile, numerous studies are being conducted on housing factors and non-housing factors perspectives on housing conditions and health. Indoor air pollution and emissions from building materials were investigated as housing-factors issues, as were infestations, inefficiency of heating systems and insulation measures, or a lack of hygiene and sanitation amenities. Meanwhile, non-housing factors such as prospective crowding and noise related to house design and layout, as well as health, were investigated [41–44].

Kabul, the capital and primate city has also undergone extensive housing transformations in the last two decades. The transformation of houses was in direct correlation to population growth and unprecedented urbanization. Insufficient government policies and strategies, individual needs and the wants of higher-income groups, and a lack of resources to fight inappropriate construction led to the transformation of the planned residential district. In 2020, CSOIRA reported that Kabul's urban population had reached 4.5 million [45]. Over 41% of the population of the entire country lives in the capital city [46]. As the population of the city grew beyond expectations, informal settlements grew horizontally around it. Meanwhile, the planned residential areas experienced illegal vertical development.

There is a variety of housing types in Kabul including courtyard houses (traditional), detached houses, apartment buildings, and houses on preserved hillsides and mountains [47,48]. In the period between 1964 and 1978, three Master Plans were developed, and

technical assistance was provided in accordance with Soviet planning principles [49]. Based on these plans, a few districts were considered individual lots that could be developed as private houses. In these areas, low-rise residential housing was permitted, and detached houses were distributed to residents by the Kabul Municipality. Following a period of relative stability in 2001, planned residential districts were challenged by unprecedented growth. These plots were most commonly developed into apartment buildings. The development as a result of building substitution densified residential areas. Densification in developing-country cities faces numerous urban challenges, including severe housing conditions, infrastructure shortages, and an increasing number of squatters [50]. Vertical densification is more important in developing countries when growth rates are high, resulting in crowding and congestion. This model was also visible in Kabul, where densification caused by housing typology substitution put pressure on public spaces, activities, facilities, and public spaces. However, in developed countries, it is generally believed that densification is an important component of urban sustainability. Oyon et al. investigated the densification of Barcelona's working-class suburbs between 1939 and 1980 [51], focusing on the replacement of single-family homes with multi-story buildings. Their research explains how such densification has caused social consequences, particularly in the areas of water, congestion, sewage, and infrastructure. However, compact city development has solved many of the problems that developed countries faced in the past.

In the wake of the appearance of apartment buildings in Kabul city, many detached house plots were negatively impacted. The residents had to deal with many issues related to the environment and social factors, which made living there uncomfortable. Today, the area is overcrowded, and basic needs are not being met as a result of the emergence of these apartment buildings. Residents of detached houses no longer receive as much sunlight as they did before. In addition, residents cannot comfortably enjoy their open spaces. The traffic stream is extremely congested and makes quite unpleasant sounds. As a result, planned residential neighborhoods with single-family lots (housing schemes) have lost their identity.

The scope of this study is limited to focusing on environmental and social issues resulting from the transformation of detached houses into Apartment buildings in Planned Residential Neighborhoods. Our study aims to analyze the impacts of transformation on aspects of social and environmental issues regarding the living condition of residents. In this regard, we evaluated the level of transformation of housing typologies. Furthermore, we examined the factors associated with the transformation of housing typology in these study areas. Meanwhile, we evaluated the perception of residents regarding their living conditions regarding environmental and social issues based on questionnaire responses. As a final step, we offered some suggestions for reducing the impact of these issues in the study areas.

1.2. Literature Review

In a society, one can discern the lifestyle through the distinctive features of the residential units, which are rooted in socio-economic and cultural characteristics [52]. Changes in habits often reflect changes in public and private behaviors, and built environments reflect the way society lives [53]. People's perceptions of a place, their meanings attached to it, and their experiences of it are insights into how urban transformation affects citizens' lives locally [54]. The houses' changing shapes reflect the transforming socio-cultural structures of each specific era, and that transformed form of the house embodies the ideology of each era. [55]. A transformation can be defined as alterations, modifications, improvements, and changes. According to Tipple (1991), transformation is the process of altering or extending a dwelling using materials and technologies that are readily available [56]. A transformation, however, is described as the alteration of an entire building, resulting in changes to what is visible in various parts of the building [57]. Activities related to changes in housing ranged from redesigning the interior of a room and painting it to making structural modifications such as adding a room or even tearing down a building [58]. In the literature, several

theories have been put forward to explain housing transformation. One such theory is the theory of housing adjustment. According to Morris and Winter (1975), people typically evaluate their housing conditions based on their family and cultural norms. This is because settlements are designed to meet the needs, social norms, and lifestyles of the people living there [59].

A variety of factors can influence the transformation of housing within a place. In particular, when the government has failed to provide housing for its citizens, especially those with low and middle incomes [60]. The transformation of urban housing is often coupled with a sense of desperation among low-income households [61]. Housing has also changed as a result of failing to incorporate traditional lifestyles and socio-economic characteristics. Moreover, personalization also contributes to transformation, although it is more prevalent in developed countries than in developing countries [62]. As it is clear, low-income households often remodel or expand their homes through alterations or extensions. This phenomenon is prevalent in most cities in developing countries. In some cases, owning a residence is a major catalyst for transformation and can help some people break the cycle of poverty [63]. In Kabul, such initiatives are also observed by private owners. As it is clear, transformation usually occurs over time. However, the Kabul transformation was rapid and was more of a replacement than an adaptation.

The evolution and transformation of housing in Kabul, as well as in other cities in Afghanistan and abroad, have been extensively studied by scholars. The historical perspective and traditional architecture of housing were researched by Hallet 1980, William B 1989, Kazimee 2002, Abdul Najimi 2016, Blackwell 2018, Umar Azizi 2019, and Sendi 2021 [64–70]. Pilar Maria 2018, Hidayat 2020, Walid Ayobi, and Ebrahimi researched the transformation of housing (traditional and modern) from a cultural perspective [71–74]. Studies by Sharifzei, et al. (2016), Vijulie 2021, Scholz 2021, and Khadour 2021 explored historical and contemporary housing revolutions from an affordability and sustainability perspective [75–78]. Gaubatz Piper 1999 and Nabizada 2012 examined housing transformation from processing, pattern, and mechanism perspectives, while Bashir 2019 explored it from a reconstruction, management, and participatory perspective [79–81]. Olubi studied the transformation of houses from the perspective of their physical and functional aspects [82]. Florence studied the relationship between housing transformation and livelihood outcomes [63]. Dundar analyzed the housing transformation from the viewpoint of its impact on the physical and social topography [83]. Makachia examined the development of housing through dweller-initiated points and strategies [84]. Researchers Michael et al. conducted research on urban transformation and its impacts on health. They examined how urban health and wellbeing are shaped by migration, mobility, racism, sanitation, and gender [85]. Reviewing the above pieces of literature gives us the result that a variety of studies has been conducted regarding housing transformation from different perspectives. As a result, we discovered that the majority of the prior studies studied housing transformation from an adaptive perspective. These studies, on the other hand, leave gaps in the examination of housing transformation from a replacement perspective of housing typology and its effects on the original housing typology.

2. Materials and Methods

District 4 is located in the center of the city as shown Figure 1. There are 369,455 residents according to Kabul Municipality, and most people who own transformed houses are from the middle to upper classes, while residents living in courtyard detached houses are from low to middle-income families. The district has a land area of 11.63 km^2 of which 83.1% is the urban area located in the central part of the city [86].

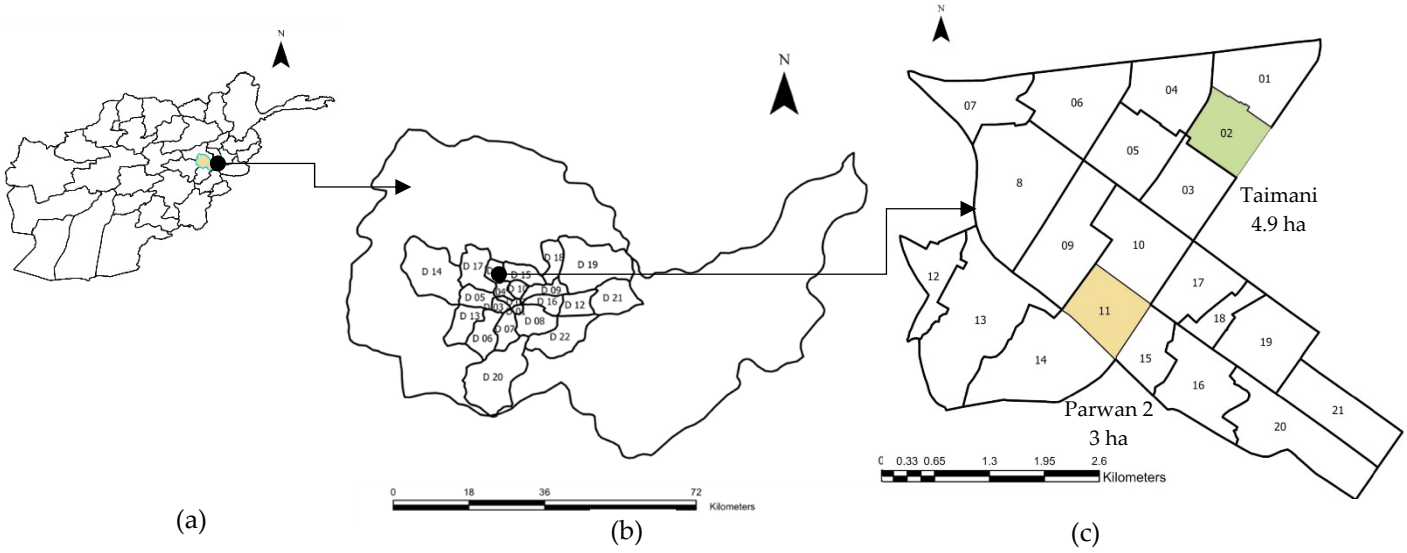


Figure 1. Location of the study area, source: Kabul Municipality; (**a**) Afghanistan and location of Kabul Province; (**b**) Kabul Province and Kabul city; (**c**) District 4: a central district in Kabul city.

In the course of our study, we discussed with the Kabul Municipality the availability of information and documents related to laws, regulations, and rules. In October 2021, aerial photographs and shape-files were collected, and some type of literature was reviewed until January 2022. The City Planning Department of Kabul Municipality provided a high-quality aerial photo of district 4. In addition, we also received rules and regulations regarding building a detached house from the Kabul Municipality Construction Permit Department. The study areas were mapped using the most recent enhanced and high-quality aerial photo of 2018. Additionally, we observed the field and took pictures of the buildings to update the features and elements of our map between January and February 2022. For physical feature analysis, a few characteristics such as the Building Coverage Area (built-up area) on a plot, the number of floors, and the typology of the buildings were considered during our physical element's analysis. We also observed the construction materials to determine the quality of the buildings.

In the next stage, to gather information related to the environmental and social impacts, we targeted the residents of detached houses. These residents were affected by the emergence of apartment buildings. We developed a semi-structured questionnaire including general instructions, personal information, and specific questions about apartment buildings and their impacts on environmental and social aspects. During our field visit, we conducted a paper-based interview. Two surveyors were assigned to administer the questionnaires. All the aspects of the questionnaires were tested on a small group of students in advance. The area was selected based on the willingness of residents to contribute and participate (resident's representatives' sessions), security, accessibility, and consultation with the Kabul Municipality authorities. The degree of transformation of housing typology was the main reason we selected the study areas. Aerial photos and our observation of buildings in each part of district 4 led to specifying the level and degree of transformation. Our research team used a simple random sampling method to collect data on social and environmental issues from affected residents living in these areas. A total of 32 responses were received from individuals, while approximately 40 houses were surveyed. Table 1 clearly describes the processes, including categories, methods, sources, and when the activities occurred. In order to analyze the questionnaires related to environmental and social aspects, descriptive statistics were applied to frequency counts and percentages. Likert scale data analysis was used to determine the weight given to variables such as ventilation, natural light, shadow effect, energy consumption, air pollution, sound pollution, and privacy. Likert scales with numerical indexes provide an effective way to judge people's opinions [70]. To analyze the resident's satisfaction scores, (5), (4), (3), (2),

and (1) were substitutes for strongly agree, agree, neutral, disagree, and strongly disagree. It was then divided by a total number of responses, which is 32, to obtain the satisfaction index. Then, it was divided by the total number of responses, which was 32, to obtain the satisfaction index.

Table 1. Data Collection Methods.

Categories	Methods	Sources	Dates
1. Documents, Records and Related articles (Laws and regulations, Statutes, Master plans and Detail Plans, Shape files)	• Reviewing • Examining	• Kabul Municipality • Websites,	October 2021 January 2022
2. Physical Features Analysis (Plot and Building Layouts, Quality of Housing, Building Height, Floor Count, and Types of Housing)	• Digitalization by ArcMap and AutoCAD • Observing through measurements, sketches, and photography	• Kabul Municipality, • Field Survey	January 2022 February 2022
3. Living Condition (Impacts of social and environmental factors on daily life)	• Questionnaires • Interviews	• Field Survey	January 2022 February 2022

To correlate the perceptions of the residents with the physical form of the houses in the study areas, impacts on the environment and social issues were classified into different types. For each type, there are specific conditions that indicate the intensity of the impact. In order to analyze all of the above issues, specific terms have been used that correspond to the actual condition. The plots were analyzed in relation to the areas around them. To simplify it, the impacts are divided into Satisfactory, Fair, and Critical Conditions:

- Ventilation is calculated on the basis of existing apartment buildings around the detached house. According to the criteria, the building should have at least three sides left open in order to be considered in a Satisfactory Condition. As long as two sides of a plot of land are enclosed by an apartment building and the other two sides are free, that plot is categorized as being in Fair condition. In contrast, a detached home that is surrounded by apartment buildings on at least three sides is considered to be in Critical Condition.
- Natural light, shadow effects, and energy consumption are evaluated based on available solar radiation from the east, west, and south. The effects of shade were studied in the morning, during the day, and in the evening. It is considered satisfactory if a detached house receives sunlight from at least two sides. In other words, the two sides of the detached house are not lined with apartment buildings. If only one side of the house receives sunlight, the condition of the single-family house is considered Fair. Detached homes may be classified as Critical if two or more sides are obscured by apartment buildings.
- Sound pollution is analyzed based on where the houses are in relation to the streets. This is because traffic is responsible for most sound pollution. For this reason, we considered the types of streets when measuring the effects of sound pollution. The Satisfactory Condition is for detached houses to be found on dead-end streets, where there is no traffic outside but only the owners' cars. In addition, they are not placed close enough to apartment buildings to hear sounds coming from human activity inside the apartments. Detached houses located on sub-main streets and not in direct view of apartment buildings are valued in Fair Condition. Among the detached houses most affected by sound are those located on collector streets. They are also being exposed to traffic sounds, human activities, and noise from crafting. Our assessment is based on the availability of streets, and the main street is not included.
- Air pollution is evaluated based on NEPA; Afghanistan Environmental Protection Agency. The evaluation was based on the average of the main air pollutants as specified by the National Protection Environmental Agency: PM2.5 = 75 $\mu g/m^3$, PM10 = 150 $\mu g/m^3$, NO_2 = 80 $\mu g/m^3$, SO_2 = 76 $\mu g/m^3$, and O_3 = 100 $\mu g/m^3$.

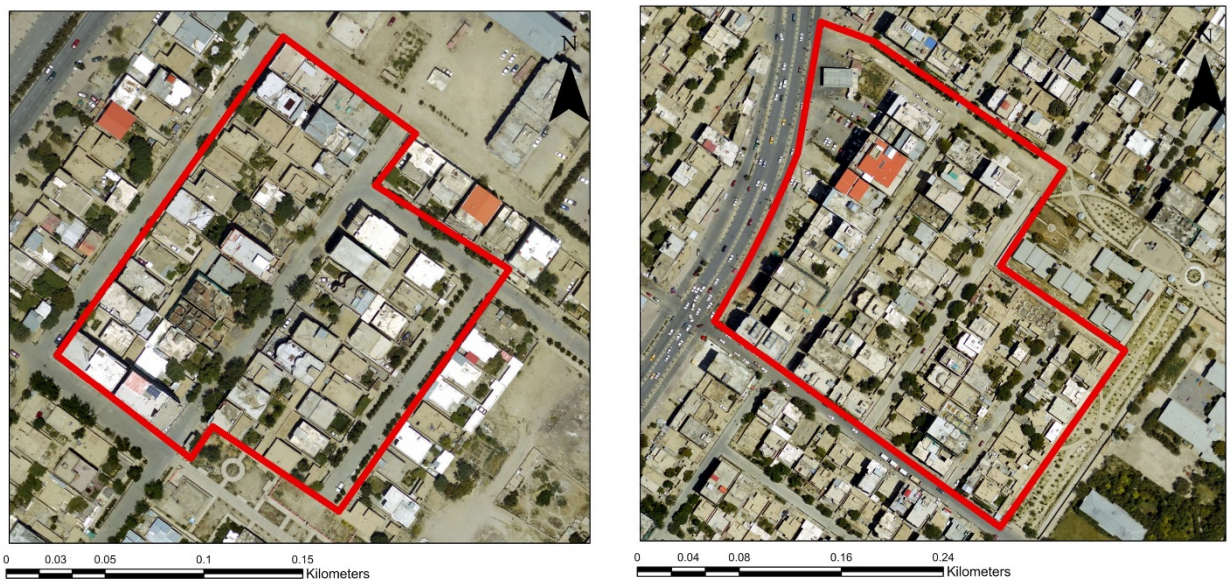
- Finally, a house has an acceptable degree of privacy if there are no apartment buildings surrounding it. Meanwhile, a house is considered in Fair Condition if it is not directly faced by apartments or if there are some apartments on the side of the house with head-level windows. On the other hand, a detached house surrounded by apartments would be rated as a Critical Privacy Condition.

3. Results

In the study, findings were derived from analyses of physical features, responses from households, and analysis of the responses to the actual conditions of study areas.

3.1. Examining Physical Forms

The analysis of the layout plan and number of stories of detached houses and multi-family dwellings in this article illustrates the transformation from detached houses to apartment buildings. Two study areas were selected for this purpose as shown in Figure 2. In addition, the typology of the buildings that Kabul Municipality specified for these were considered. The plots size is typical about to 300 square meters. The type of buildings which allowed to be built is detached houses. Based on Kabul Municipality typical plans, the building coverage ratio is about 40–50%. The residents can build a building in two floors based on construction perm it process.



(**a**) (**b**)

Figure 2. Aerial photos of study areas; (**a**) Parwan-2: a study area located in southern part of district 4; (**b**) Taimani: a study area located in northern part of district 4.

Our study areas underwent many changes between 2018 and 2021. According to the observations we made in the study area, many apartment buildings emerged in Taimani and Parwan-2. Originally, these two areas were intended to be low-rise, detached courtyard houses, as shown in Figure 3.

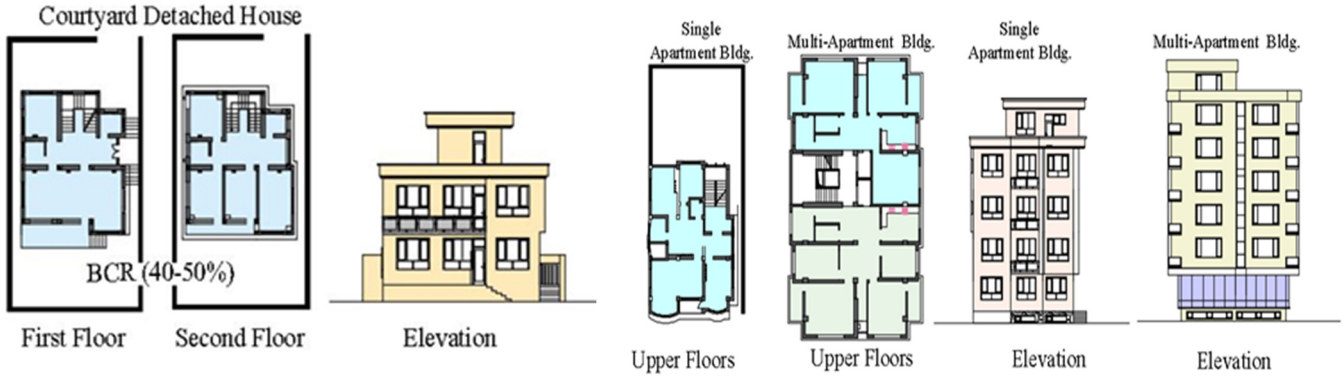


Figure 3. Existing types of buildings layouts in Study Areas; (**a**) detached house scheme designed for low rise residential neighborhoods; (**b**) transformed scheme of houses with single type apartment buildings and multiple apartment buildings.

Any other use of typology, on the other hand, must be approved by the Kabul Municipality Board. Despite this, many apartment buildings have been built to replace detached houses. Changes in housing typology led to significant changes in household numbers as well. Current condition of houses is shown in top view and three dimension in Figures 4 and 5. Both areas of focus were intended to have 97 households in total. This quantity has since increased to 395. Taimani is home to 219 households, while Parwan-2 is home to 176.

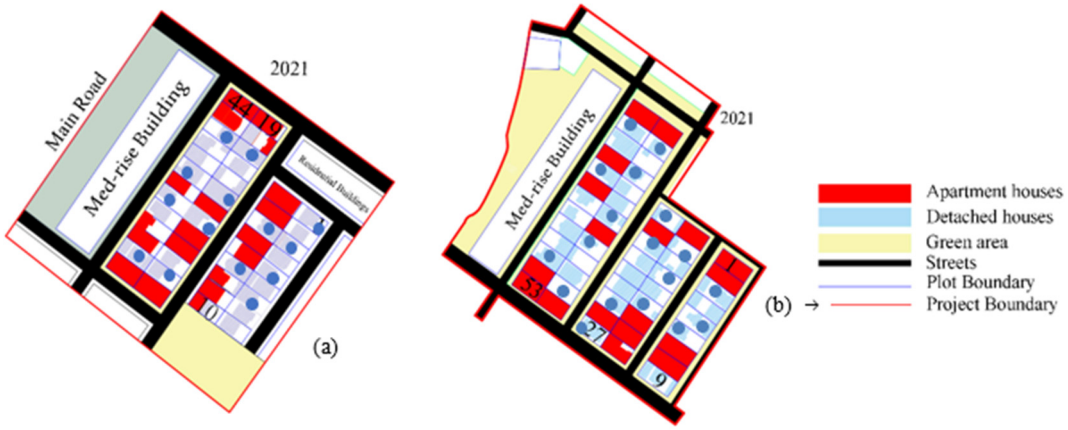


Figure 4. Current Condition of Study Areas and Surveyed Houses: (**a**) Parwan-2; (**b**) Taimani.

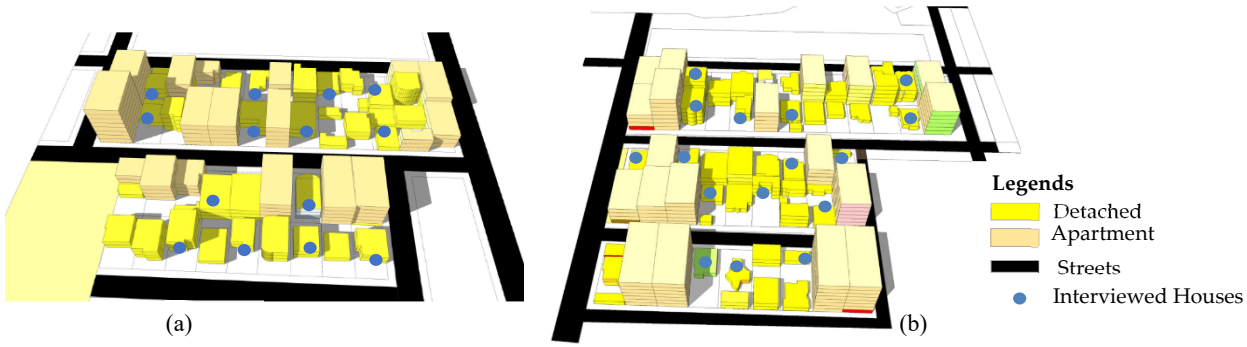


Figure 5. Three-Dimensional Version of Current Condition of Study Areas and Surveyed Houses: (**a**) Parwan-2; (**b**) Taimani.

According to our updated maps, 18 buildings in Taimani and 19 apartment buildings in Parwan-2 were identified in the study areas. The buildings that were transformed broke

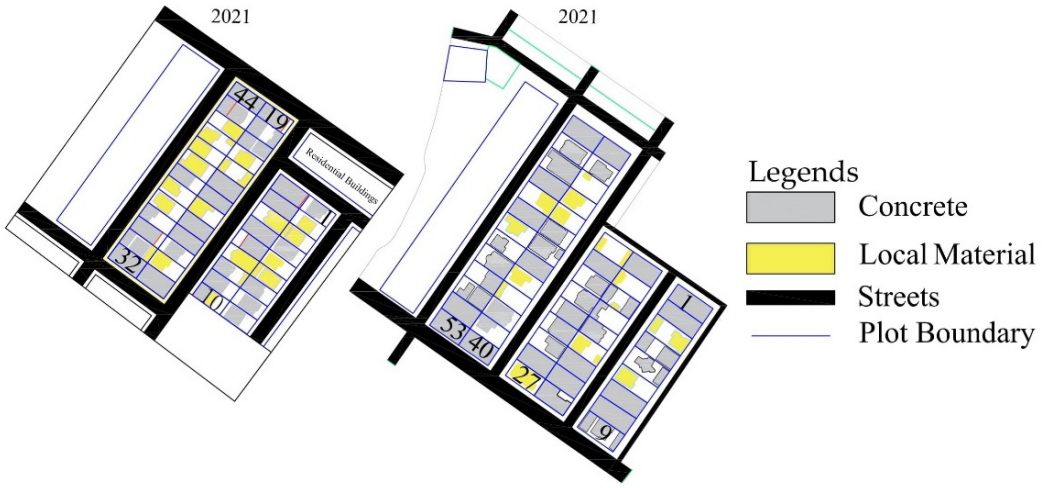
all the rules and regulations. In the case of the Building Coverage Ratio, both study areas were severely violated. However, when it comes to the number of floors, Parwan-2 is slightly superior.

According to Table 2, the number of floors is more ignored in Taimani. In general, both study areas accepted a large number of populations as a result of typology transformation. The houses are built of concrete and local materials as shown in Figure 6. Most of them are made of reinforced concrete, an expensive material, and were built recently according to our field visit photography as shown in Figure 7. This has virtually challenged the Kabul municipality to take immediate action. In order to understand better the impacts of these violations, in the next section, we discuss the perception of residents based on questionnaires.

To understand how much the areas have been densified, we must compare the density of our study areas before and after transformation. Both research areas cover 7.9 hectares. According to estimates, the family size is around 6.2 people. To calculate the previous time, 97 families lived in both study areas. There were 601 people living there, with a population density of 76 people per hectare. In comparison to the post-transformation period, 395 families result in 2449 people, which is a threefold increase. Based on current population, the density is approximately 310 people per hectare. Overall, the transformation increased population density as well as densified buildings.

Table 2. Statistic of Transformed Houses in Study Areas.

No	Content	Taimani		Parwan-2		Total
1	Number of Plots	53		44		97
2	Total Transformed Houses	18		19		37
3	Households	219		176		395
	Rules and Regulations	Considered	Ignored	Considered	Ignored	Total
4	Building Coverage Area	0	18	1	17	35
5	Number of Floors	6	12	9	9	21
	Housing Material	Concrete	Local	Concrete	Local	Total
6	Interviewed Houses	10	8	8	6	32
7	Study Area	40	13	31	13	97



(**a**) (**b**)

Figure 6. Housing Material in Study Areas: (**a**) Parwan-2; (**b**) Taimani.

Figure 7. Field survey photography: (**a**) Parwan-2; (**b**) Taimani.

3.2. Impacts of Housing Tranformation on Living Condition of Residents

Housing typologies transformation and violations of regulations have created a number of social and environmental problems. Following the emergence of apartment buildings, the number of households increased unexpectedly. The proliferation of apartment buildings in the study area has created negative impacts on the living conditions of residents. For this reason, we collected the opinion of residents through questionnaires. We targeted a total of 40 houses for our research; however, 32 houses supported us by giving their opinions.

3.2.1. Environmental Impacts

Ventilation

Natural ventilation contributes to the health of living spaces by ensuring adequate airflow through every room's external opening. As the building has windows formed on the perimeter, wind can circulate through these areas. Buildings surrounding these houses obstructed their external openings, resulting in a lack of air inside the houses. Based on our questionnaires, only one-third of the houses in our study area can be ventilated normally. However, about 66% of these respondents' houses rely on mechanical apparatus for ventilation. In addition to shortness of breath, constant headaches, and fatigue caused by inadequate ventilation, more than 59% of respondents indicated having experienced those symptoms as shown in Table 3.

Table 3. Ventilation Status.

NO	Ventilation	Taimani	%	Parwan-2	%	Total	Yes (%)
1	Can you normally get ventilation in your house?	4	22.0	7	50.0	11	36.0
2	Do you use mechanical apparatus to ventilate houses?	14	78.0	7	50.0	19	64.0
3	Have you ever experienced any illness (asthma, fatigue, headaches) due to lack of ventilation?	13	72.0	6	43.0	19	58.0
	Total Respondents	18		14		Frequency $N = 32$	

Energy Consumption and Shadow Impact

Lack of natural light as a result of constant shadow and inadequate ventilation directly contributed to an increase in energy consumption. According to 56% of respondents, they

have access to sunshine for less than 3 h during the day. The only time they see direct sunlight is during the morning hours, as indicated by their responses. As Kabul is cold in winter, the shading of these apartment buildings severely affects the residents' quality of life. The lack of sunshine has led to double combustion for heating according to 47% of affected residents in these study areas. A number of these affected owners even tried to leave the area, but because of these impacts, the cost of the plot has dramatically decreased. The majority of those interviewed, on the other hand, said summer was hot because of airflow disruptions. It is impossible to live without air conditioning or other forms of cooling. In these study locations, cooling costs represent a burden for 47% of the affected households as depicted in Table 4. The rise of apartment buildings boosted heating and cooling costs while also causing major bone ailments. As a result of consecutive shadow effects, 59% of respondents express concerns about orthopedics.

Table 4. Status of Energy Consumption and Shadow Impact.

NO	Energy Consumption and Shadow Impact	Taimani	%	Parwan-2	%	Total	Yes (%)
1	Did the shadow effects increase your heating cost during the winter?	8	44.0	7	50.0	11	47.0
2	Did the exterior openings blockage increasing cooling cost during summer?	8	44.0	7	50.0	19	47.0
3	Have your experienced illness(orthopedic) due to lack of sunshine?	13	72.0	6	43.0	19	58.0
4	How many hours the sun shining in your houses? (In case of less than 3 h)	11	61.0	7	50.0	18	56.0
	Total Respondents	18		14		Frequency $N = 32$	

Air Pollution

During the field visit, we learned that residents utilize coal and oak to heat their homes since electricity is scarce and gas is expensive. The heating system is decentralized, and different tools are used to heat the houses. In both study areas, these materials burned, adversely affecting the lives of the residents. The affected residents claim that the emergence of apartment buildings contributes to the maximum amount of smoke being emitted in winter. Moreover, public baths contribute to air pollution in large quantities due to burning tires and coal. They need to shut the windows frequently in the winter in order to avoid smoke coming into their houses. During the winter, when smoke is most abundant, they sometimes cannot see close distances, especially at night. In an analysis of questionnaire responses, residents stated that air pollution severely impacted their quality of life. Table 5 shows that 97% of residents suffer from respiratory diseases. Residents in both of the study areas were complaining about the deteriorating quality of life due to air pollution. Based on our survey, we found that only two houses in Taimani and one house in Parwan-2 use an air purifier which is not very common up to now. The rapid pace of housing transformation in the future will cause residents to suffer more without consideration.

Table 5. Air Pollution Status.

NO	Air Pollution	Taimani	%	Parwan-2	%	Total	Yes (%)
1	Does air pollution due to local material combustion affected quality of your life in winter?	18	100.0	14	100.0	32	100.0
2	Have you ever been ill from air pollution? (Respiratory diseases)	18	100.0	13	93.0	19	97.0
3	Do you use air purifier for your house?	2	11.0	1	7.0	3	9.0
	Total Respondents	18		14		Frequency $N = 32$	

Sound Pollution

We are constantly surrounded by noise, whether they are natural sounds such as bird sounds or human activities such as vehicles and crowds. The unwanted sound, however, can trigger anxiety and stress when it is loud and frequent. As a result of continued exposure to noise pollution, sensitivity increases, and human mood and behavior are affected negatively. Unfortunately, many residents in our study areas were also unsatis-

fied with the effects of the noises. These two study areas were supposed to be home to 97 families in total. However, because of changes to the housing typology, the number of families grew to 395. The most annoying sources of sound pollution, according to our site visit, are traffic noise, children's voices, and human activity. As a result of our analysis of the questionnaires from these study areas, we have concluded that the noisy environment is present from eight in the morning until four in the evening. In the daytime, 88% of residents regularly close their windows to avoid noise entering their homes. Meanwhile, about 56% of them experienced temporal behaviors due to a noisy environment. Even so, about 18% of them had physical and verbal conflicts in these study areas as stated in Table 6.

Table 6. Resident Response to Sound Pollution.

NO	Sound Pollution	Taimani	%	Parwan-2	%	Total	Yes (%)
1	Do you close windows to decrease the sound pollution due to over-crowdedness during the day?	15	83.0	13	93.0	28	88.0
2	Have you experienced harsh temper and debates with neighbor due to noisy environment?	4	22.0	2	14.0	6	18.0
3	Does the noisy environment affect your mentality and health?	10	56.0	8	57.0	18	56.0
4	What time of the day do you feel much noisy? (In case of 8–16 pm)	10	56.0	12	86.0	22	71.0
	Total Respondents	18		14		Frequency $N = 32$	

Natural Light

Ignorance of setback rules and floor number increments distorts natural light, which is one of the most significant aspects of display, prestige, and mood. Based on our interviews, we found that 53% of respondents experienced visual discomfort due to a lack of natural light as shown in Table 7. Over half of these respondents use artificial light in their homes during the day. In addition, the shadiness of apartment buildings and the resulting daytime darkness caused about 56% of residents to feel fatigued and nostalgic. Eventually, this issue resulted in mental and visual impairment.

Table 7. Responses of Residents to Natural Light.

NO	Natural Light	Taimani	%	Parwan-2	%	Total	Yes (%)
1	Does emergence of apartment buildings affect your visual discomfort?	10	56.0	7	50.0	17	53.0
2	Do you feel fatigue and nostalgic due to lack of natural light?	11	61.0	7	50.0	18	56.0
3	Do you switch on artificial light during the daytime?	10	56.0	8	57.0	19	56.0
	Total Respondents	18		14		Frequency $N = 32$	

3.2.2. Social Impacts

Privacy Issues

Creating houses is a way to hide your personal views. The high level of privacy in a space promotes a sense of satisfaction among its occupants. As long as the parties respect each other's rights, privacy is maintained. However, inadequate privacy provisions in rooms can cause social conflict and irritation among residents. In the study areas, the building height varies, and the proximity of the buildings makes most residents feel uncomfortable with their privacy being respected. Increased apartment construction led to an increase in the area's population. As a result, the house lacks privacy within its rooms. In Table 8, you can see that 88% of residents have to continually pull down their curtains to hide their houses from their neighbors. In addition, these issues, residents say it is difficult to have normal family conversations because of the proximity of the buildings. Based on questionnaire results, we concluded that women and girls in outdoor spaces of detached houses cannot spend their time as they used to. This led residents to feel depressed due to a lack of access to outdoor space. Our realization has led us to realize that the current living conditions are not optimal for most residents in terms of privacy.

Table 8. Residents view regarding privacy.

NO	Privacy	Taimani	%	Parwan-2	%	Total	Yes (%)
1	Do you often pull you curtains to hide the house from neighbors?	15	83.0	13	93.0	32	88.0
2	Is it possible for you to use the open space in your house conveniently?	7	39.0	7	50.0	14	44.0
3	Can you talk and make conversation with your family conveniently due closeness of buildings?	8	44.0	6	50.0	14	44.0
4	Have you experienced any depressed due to privacy issue?	10	56.0	8	57.0	18	56
	Total Respondents	18		14		Frequency $N = 32$	

Stepping outside and enjoying their leisure time is difficult for women in Afghanistan's conservative society. When there is a male partner, they tend to hang out. We spoke with several individuals about their access to parks and recreational amenities. Despite their availability, many respondents indicated that neighborhood parks and playgrounds were unsuitable for women and children. Parks are usually overcrowded and the view of inside is not protected. Non-residents from the local neighborhoods and from outside typically crowd the parks. Our inquiry into why this is happening discovered that the parks are managed by Kabul's municipal government, which does not include the city's people. The Kabul Municipality is now experiencing a human resource and technical labor deficit. As a result, they have a great deal of difficulty controlling the administration of parks and playgrounds.

Psychometric techniques are used to measure traits such as abilities, perceptions, and qualities in social science and educational studies. Resist Likert developed the Likert technique, which has gained widespread popularity. To assess attitudes, the scale provides a range of responses to a given statement or question [87]. In general, using this scale and the corresponding index number to measure people's opinions is a reliable method. Thus, by using the Likert scale, we determined the frequency of responses to each question. Alternatively, a range of numbers, such as 5, 4, 3, 2, and 1, is assigned to indicate strongly agree, agree, neutral, disagree, and strongly disagree. Each frequency is multiplied by its value to obtain the result. To obtain the result, each frequency is multiplied by its value. Each frequency is multiplied by its value to obtain the result. The satisfaction index was calculated based on the results and the number of respondents. The satisfaction index for each question is calculated using the equation below.

$$Satisfaction \frac{Total\ Score\ Weighted}{Responses\ Total}$$

Table 9 clearly shows the association between residents' responses and social and environmental issues. The satisfaction indexes are the interpretations of the Likert scale results. The lowest satisfaction pointed are highlighted in red color. According to the results, air pollution has the lowest satisfaction rate among other questions. Following, privacy has the highest amount of disagreement, while sound pollution ranked third in terms of disagreement. Other elements, such as ventilation, energy consumption, shadow effects, and natural light, are positioned in the final step. The majority of questions received less for the required level of satisfaction. These variables were either neutral or in the domain of disagreement. Meanwhile, as observed in Table 9, respondents expressed their satisfaction with only a few questions. Therefore, we conclude that based on the opinion of the respondents, those who are living in detached houses are adversely affected by apartment buildings. As a result, we infer that, in the opinion of the residents, apartment buildings are detrimental to those who live in detached houses. Residents have major health problems as a result of the appearance of apartment buildings, and their quality of life has decreased. The perspectives of residents are critical to the accuracy of our research. On the other hand, we would assess the current environmental and social repercussions based on physical feature analysis. This would ensure the validity of our research and confirm the respondents' opinions.

Table 9. Analysis of residents' opinion based on Likert scale.

Variables		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Liker Interpretation	
Likert Scale Score		5	4	3	2	1	Weighted Total	Satisfaction Index
		4.3–5	3.5–4.2	2.7–3.4	1.9–2.6	1–1.8		
Ventilation	Q1	0	48	18	24	2	92	2.88
	Q2	0	36	9	38	1	84	2.63
	Q3	0	28	15	38	1	82	2.56
Energy Consumption & Shadow Effects	Q4	0	56	21	22	0	99	3.09
	Q5	0	20	24	38	0	82	2.56
	Q6	0	20	24	38	0	82	2.56
	Q7	0	36	15	36	0	87	2.72
Air Pollution	Q8	0	0	0	28	18	46	1.44
	Q9	0	36	9	34	3	82	2.56
	Q10	0	116	0	6	0	122	3.81
Sound Pollution	Q11	0	12	3	56	0	71	2.22
	Q12	0	72	24	12	0	108	3.38
	Q13	0	28	21	36	0	85	2.66
	Q14	0	24	12	44	0	80	2.50
Natural Light	Q15	0	12	36	34	0	82	2.56
	Q16	0	36	15	36	0	87	2.72
	Q17	0	36	12	38	0	86	2.69
Privacy	Q18	0	0	0	44	10	54	1.69
	Q19	0	56	36	10	1	103	3.22
	Q20	0	56	39	10	0	105	3.28
	Q21	0	32	18	36	0	86	2.69

Q-Question

4. Analysis and Discussions

Apartment buildings are sprouting up all throughout the city. Less than 30% of the total urban area is constituted of planned resident districts. These areas were mostly designed and implemented in accordance with Russian Master Plans produced during the 1960s and the 1980s. District 4 was one of the city's first residential districts, built according to the designs stated above. The design relied on a regular distribution system and detached housing. Moreover, three-quarters of the district's land area is developed. The district is attractive due to its centrality and accessibility, as well as the affordable illegal apartments. An overwhelming level of urban growth resulted in multiple apartment buildings in these places. As a result, overcrowding, transportation congestion, building congestion, and a transformation in housing typology occurred. As a result of these challenges, several issues, including environmental and societal issues, have arisen. Poor ventilation, shadowing, air pollution, sound pollution, and privacy are just a few of the issues. Our paper's time and capacity constraints precluded us from focusing on numerous additional concerns related to the rise of apartment buildings.

High-density residential ventilation is heavily influenced by urban morphology and street-to-building interaction. As wind circulates around and between buildings and built-up areas, it increases pedestrian comfort, thermal comfort, and pollutant dispersal [88]. Reduced wind velocity, urban heat, noise, and pollution all impede the urban environment [89]. As a result of reduced airflow between buildings, human health is being targeted. In our case, apartment complexes also obstructed airflow in the study locations. The wind hit most buildings from two sides or less. This indicates that the majority of detached houses have Fair to Critical Conditions.

Meanwhile, a building's orientation, window ratio, and wall ratio all have an impact on energy efficiency. Urban energy consumption is widely acknowledged as an essential component of daily life and economic activity [90]. Buildings adjacent shade the residences in the targeted region, lowering cooling demand in the summer and increasing heating demand in the winter [91]. South-facing rooms receive a lot of sunlight in the winter. In the morning and evening, the east and west sides are the brightest. Because detached houses are bordered by apartment buildings, they generate long shadows during the day. Figure 8 shows how thoroughly the research areas were assessed in terms of the shadow effect. In the winter, the effects of shadow are closely tied to energy usage. At the same time,

consumption is also strongly related to ventilation when the wind direction is blocked by apartment buildings. Therefore, energy consumption is considered in two cases, winter and summer. In addition, the material of the house also plays a role in heating and cooling costs. Reinforced concrete is made of metal and stone and these two materials are efficient conductors of heat. In our study areas, there are more affected houses made of reinforced concrete. Consequently, they suffer more from heating and cooling aspects. Another consequence of urbanization is an increase in noise pollution. Because cities' land use is more prone to produce road traffic and other human activities, noise pollution has a severe influence on public health, particularly for urban residents [92]. Noise is psychologically annoying and can trigger strong feelings such as rage, disappointment, anxiety, and melancholy [93]. As a result of changes in the body system, long-term exposure to high-level noise damages the cardiovascular system, brain system, and endocrine system [94]. Our research analyzed this concern based on the types of streets and traffic.

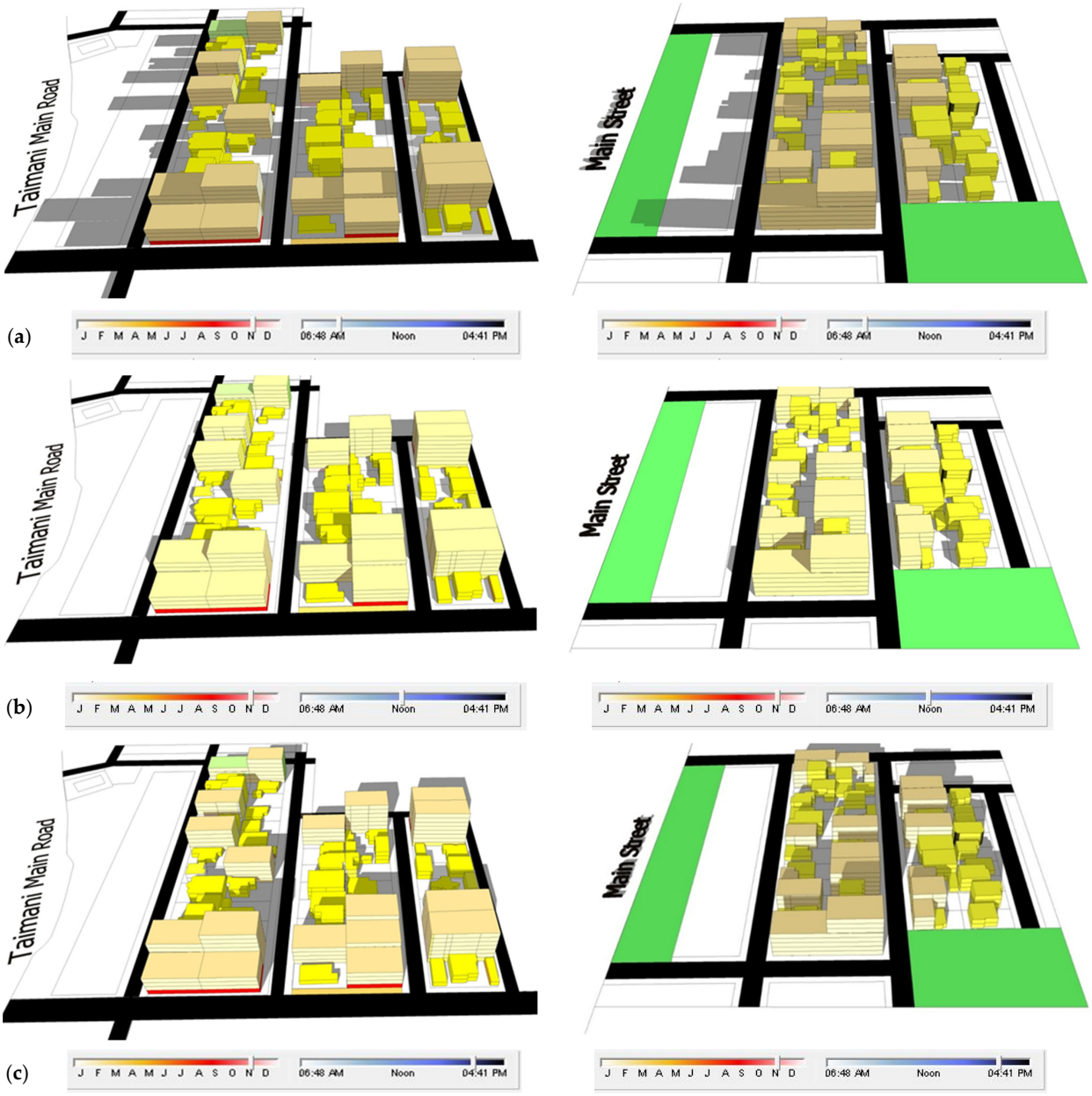


Figure 8. Shadow impact analysis projection of study areas: (**a**) morning times; (**b**) noon times; (**c**) afternoon times.

As the population grows, food production, transportation, and housing demand may increase, which could further contribute to air pollution [95]. The issue of air pollution is one of the most pressing concerns for residents. Almost all respondents expressed concerns regarding air pollution. In our research, we also found that apartment building owners complain about pollution during the winter. We, therefore, evaluated the air pollution of both study areas based on the report of the National Environment Protection Agency (NEPA) [95]. This report indicates that their focus was on the main air pollutants (PM2.5, PM10, NO_2, O_3, and SO_2) according to Table 10. In addition, we also considered the Average National Standards for Air Quality in Kabul city [96] according to their evaluation, which was conducted in two districts around our study areas in February 2021. All the above pollutants were higher than the NEPA standard. The report confirms that the responses are accurate and match the report of the National Environmental Protection Agency. For this reason, we gave air pollution a Critical condition evaluation mark.

Table 10. Air pollutants status.

Pollutants	ANAQS (Avg.)	NEPA	Period (h)
PM 2.5	75 $\mu g/m^3$	272 $\mu g/m^3$	24
PM 10	150 $\mu g/m^3$	344 $\mu g/m^3$	24
NO_2	80 $\mu g/m^3$	147 $\mu g/m^3$	24
SO_2	50 $\mu g/m^3$	76 $\mu g/m^3$	24
O_3	100 $\mu g/m^3$	123 $\mu g/m^3$	8

ANAQS: Afghanistan National Air Quality Standard NEPA; Afghanistan Environmental Protection Agency.

According to various definitions, privacy is mainly the need for space for visual, physical, and psychological separation [97]. In essence, privacy serves three main functions: limiting social interaction, developing strategies for managing it, and maintaining identity [98]. The uncontrolled construction of urban areas often results in many problems, including the difference in building heights, and the close proximity of buildings, especially in developing countries. We researched privacy in the context of unexpected buildings that were constructed at varying heights and distances.

As a result of the above evaluation, we were able to categorize the effects of various issues on detached house conditions into different categories as illustrated in Figure 9. In Figure 10, the type of impact on a detached house is shown. Type-A, for example, indicates that all variables such as ventilation, natural light, energy consumption, shadow impact, noise pollution, and privacy are marked with negative marks. Likewise, the B-type received the second-lowest score for these variables after Type-A. Therefore, Type A and B are determined to be in Critical Condition. The effects of these issues are classified as Type C when three or four of the aforementioned variables are acceptable to the residents. However, Type D and E have consensus from residents in no fewer than five variables. Determining the number of variables determines the types of impacts as shown in Figure 10. There are many subtypes embedded in each type, based on the similarity and closeness of effects. Depending on where the detached houses are located in relation to apartment buildings, they are classified into these sub-types.

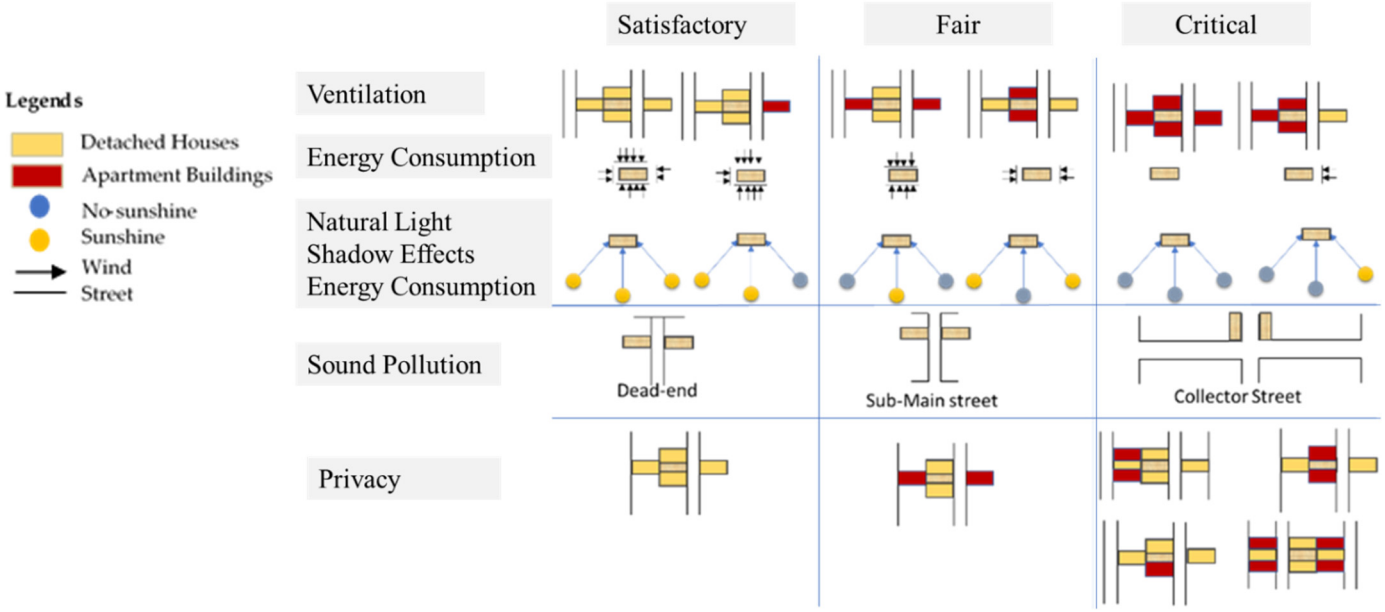


Figure 9. Categorizing of issues based on single impacts.

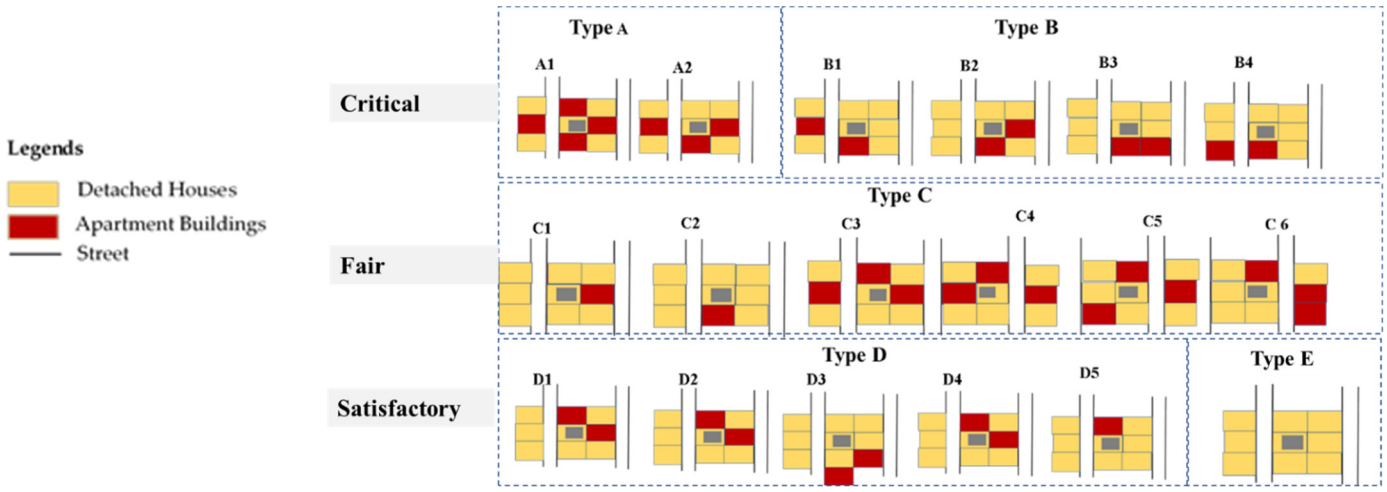


Figure 10. Categories for location layout of living environmental and social influences.

Tables 11 and 12 summarized the findings from both study areas, taking into account Figures 9 and 10. The issue of the impact of apartment buildings on detached houses is clearly stated. As shown in Table 10, the majority of houses in Taimani are of types A and B. As a direct consequence, the majority of detached houses in our study area are in Critical Condition. The status of two detached houses in the same table is now Fair and is heading toward Critical, as shown in light blue. Table 11 in Parwan-2 depicts the impact of apartment buildings on detached houses. Nearly half of the houses are classified as Type A or Type B, according to an analysis. However, 50% of the houses were rated as being in acceptable condition. Based on the current rate of development, the Satisfactory Condition is likely to worsen to a Fair Condition in the coming years. The most major issue, according to our analysis of the variable effects, was air pollution. Noise pollution came in second and privacy came in third. Residents in both study areas provided fair to good marks to other variables. The parties' privacy and identities are protected as long as they respect each other's rights. At last, the emergence of apartment buildings has a significant impact on both study areas.

Based on Table 13, the results of the above tables indicate that these issues are significant in study areas. We discovered that our study areas were most influenced by the

factors that had the lowest scores. A Type-B assessment earned the highest scores for both Poor (X) and Moderate (Δ) with 54 and 37, respectively. There is no Good(O) score for Types A and B. However, Type-C also achieved moderate to poor scores. This type has a higher incidence of mutations than Type-B. Our evaluation gave Type-D the mark of Good (O) score of 47. Based on all of the factors that have the greatest impact, the Critical condition obtained the highest score. The Satisfactory Condition takes second place, while Fair Condition take the last place.

Table 11. Result of Taimani Analysis.

Taimani Project														
No	**Affected Plots**	**Plot Position**				**Building Material**	**Issues**							
		Front	**Back**	**Left**	**Right**		**Ventilation**	**Natural Light**	**Shadow Effect**	**Energy Consumption**	**Air Pollution**	**Sound Pollution**	**Privacy**
1	3	Str+DH	Open	Str+DH	Ap.Bd	Local	O	O	O	O	X	X	Δ
2	5	Str+DH	Open	DH	DH	Concrete	Δ	O	O	O	X	X	X
3	6	Str+DH	Open	Ap.Bd	DH	Local	Δ	Δ	Δ	Δ	X	X	X
4	11	Str+Ap.Bd	Ap.Bd	Ap.Bd	DH	Local	X	Δ	Δ	Δ	X	X	X
5	13	Str+DH	DH	DH	Ap.Bd	Concrete	O	O	O	O	X	X	Δ
6	15	Str+DH	DH	DH	DH	Local	Δ	Δ	Δ	Δ	X	X	X
7	19	Str+DH	Ap.Bd	Ap.Bd	Str+DH	Local	Δ	Δ	X	X	X	X	X
8	21	Str+DH	DH	DH	Ap.Bd	Concrete	O	O	O	O	X	Δ	O
9	25	Str+DH	Ap.Bd	Ap.Bd	DH	Concrete	Δ	X	X	X	X	X	X
10	27	Str+Ap.Bd	Ap.Bd	Str+DH	Ap.Bd	Local	X	Δ	Δ	Δ	X	X	X
11	29	Street	Ap.Bd	Ap.Bd	DH	Concrete	Δ	O	O	O	X	X	Δ
12	31	Str+DH	DH	Ap.Bd	DH	Local	Δ	O	O	O	X	X	Δ
13	34	Str+DH	Ap.Bd	DH	DH	Concrete	Δ	Δ	Δ	X	X	X	Δ
14	36	Str+DH	DH	Ap.Bd	DH	Local	O	O	O	O	X	X	Δ
15	38	Str	DH	DH	DH	Concrete	X	X	X	X	X	X	X
16	42	Str	DH	Ap.Bd	DH	Concrete	Δ	Δ	Δ	Δ	X	X	X
17	45	Str	DH	Ap.Bd	Ap.Bd	Local	Δ	Δ	Δ	Δ	X	X	X
18	51	Str	DH	Ap.Bd	DH	Concrete	Δ	Δ	Δ	Δ	X	X	X

Str-Street, DH-Detached Houses, Ap.Bg: Apartment Buildings	Poor	X	Type A (Critical)
			Type B (Critical)
	Moderate	Δ	Type (Fair)
	Good	O	Type C&D (Satisfactory)

Table 12. Result of Parwan-2 Analysis.

Parwan-2 Project														
NO	Affected Plots	Plot Position				Building Material	Issues							
		Front	Back	Left	Right		Ventilation	Natural Light	Shadow Effect	Energy Consumption	Air Pollution	Sound Pollution	Privacy
1	1	Str+DH	Ap.Bd	Str+DH	DH	Concrete	Δ	O	O	O	X	Δ	Δ
2	3	Str+DH	DH	DH	DH	Local	Δ	Δ	Δ	Δ	X	O	Δ
3	5	Str+DH	Ap.Bd	DH	DH	Local	O	O	O	O	X	Δ	Δ
4	7	Str+DH	Ap.Bd	DH	DH	Local	O	O	O	O	X	Δ	Δ
5	13	Strt+DH	DH	Ap.Bd	DH	Concrete	Δ	X	Δ	Δ	X	X	X
6	16	Strt+Ap.Bd	DH	Ap.Bd	Ap.Bd	Local	X	X	Δ	X	X	X	X
7	21	Strt+DH	DH	Ap.Bd	DH	Local	O	O	O	O	X	X	Δ
8	24	Str+DH	DH	DH	Ap.Bd	Concrete	O	Δ	X	Δ	X	X	X
9	26	Str+DH	DH	Ap.Bd	Ap.Bd	Concrete	X	X	Δ	Δ	X	X	X
10	30	Str	DH	DH	Ap.Bd	Concrete	X	X	X	X	X	X	X
11	33	Str	Ap.Bd	Ap.Bd	Ap.Bd	Concrete	Δ	x	x	x	X	X	X
12	37	Strt+Ap.Bd	DH	DH	Ap.Bd	Local	Δ	Δ	Δ	Δ	X	X	X
13	40	Strt+Ap.Bd	Ap.Bd	Ap.Bd	DH	Concrete	O	O	O	O	X	X	Δ
14	42	Strt+Ap.Bd	DH	DH	DH	Local	O	O	O	O	X	X	Δ
Str-Street, DH-Detached Houses, Ap.Bd: Apartment Buildings							Poor	X		Type A (Critical)			
										Type B (Critical)			
							Moderate	Δ		Type (Fair)			
							Good	O		Type C&D (Satisfactory)			

Table 13. Total issues results.

	Name	O	Δ	X	%	Condition
Type	A	0	0	14	100.0	Critical
	B	0	37	54	59.3	
	C	0	10	11	52.4	Fair
	D	47	21	23	25.3	Satisfactory
	E	5	1	1	14.3	
	Total	52	69	103	46.6	

The results of each study area are shown separately in Table 14. Taimani has a lower satisfaction rate than Parwan-2, according to our physical analysis. In both study areas, however, the number of residents who are satisfied with the minimum condition is similar. Meanwhile, our physical inspection revealed that there are more houses in Taimani with Fair conditions than in Parwan-2. Three houses are classified as being in Fair Condition, two in Taimani and one in Parwan-2. Even so, since the level of satisfaction in Parwan-2 is nearly 10% higher than in Taimani, Critical Condition is lower. Our research discovered that both study areas in District 4 are vulnerable; however, the northern area is the most likely to be impacted.

Table 14. Result of Study Areas.

Condition	Taimani	%	Parwan-2	%
Satisfactory	7	38.9	7	50
Fair	2	11.1	1	7
Critical	9	50	6	43
Total	18	100	14	100

We can confirm that the residents' concern about the critical condition is accurate based on the physical analysis and our findings. The identity of these areas as low-rise housing areas has been lost. Despite the fact that these areas were preferred for our study, District 4 and all other residential neighborhoods confront the same challenges. Current trends in housing development appear to suggest that the issues will get worse in the future. In such a case, early intervention against apartment building developments in low-rise residential neighborhoods is truly unavoidable.

This study has enormous practical significance. The emergence of apartment buildings increased the number of housing units from 97 to 395. The difference between the actual number of houses in the back and the current number is approximately 295. Consequently, there was overcrowding and heavy building congestion in the study area. However, it also caused numerous environmental and social issues. The transformation of the housing typology from a replacement perspective has left half of the area in critical condition from a health and living standpoint.

To conclude, overpopulation, pollution, and the use of fossil fuels are just a few of the ways humans harm the environment. Human interactions with the environment have resulted in climate change, land degradation, air pollution, poor ventilation, and housing congestion. This environmental transformation is the result of people meeting their own needs. Drilling holes, building dams, and constructing new houses can all have a significant impact on the environment, either positively or negatively. Hammond in 1995 [99] theoretically justified this relationship between human activity and the environment. As a result of this interaction, human health is impacted by polluted air and water, degraded services, and a number of other factors [100]. As a consequence of our research, we have concluded that housing transformation has a profound impact on society. These adjustments (Morris and Winter, 1975) may make a substantial difference to our living and health conditions.

5. Recommendations and Suggestions

Our entire housing typology must be preserved in planned residential neighborhoods in order to limit problems in planned neighborhoods. Despite the existing laws and regulations, detached houses may still be converted into apartments in the future. Besides these laws and regulations, it is imperative to pay attention to the actors and stakeholders involved in the enforcement of construction projects. According to our investigation, buildings are currently monitored, inspected, and enforced by just one organization, the Kabul Municipality. Recent figures indicate that there are too few engineers overseeing and inspecting the construction work in Kabul compared with the number of houses. We learned from our interview with Kabul Municipality officials that about 40 engineers are responsible for monitoring and checking residential buildings. Kabul's urban area consists of 359,178 residential plots, out of which 291,948 need to be checked by monitoring officers (Kabul Municipality). As a result, a large number of construction activities cannot be monitored due to a shortage of monitoring officers. Therefore, it is essential to involve many stakeholders to reach the goal of monitoring demand. For this very reason, there is a huge need to change the top-down model to a bottom-up one. Engineering Associations and Residents' Councils (Gozar Assembly and Community Development Councils) are suitable from both a technical and a social perspective. By including these stakeholders, rules and regulations can be enforced more easily, as well as responsibilities can be shared more equally. Furthermore, because the neighbors will be impacted, they should be a part of the decision-making process. As part of the agreement, owners should be obligated to

comply with rules and regulations. In addition to the above points, the following could also prevent the transformation of housing typology:

- Land uses rules and regulations should be revised based on the current situation. In addition, zoning plans with detailed specifications should be prepared to control the development in every district of Kabul city.
- To prevent the further emergence of apartment buildings in the study areas, residents' councils should be part of decision makers for construction permit issuances. In this case, the violation of the construction rules shall be minimized.
- To obtain more effective results from involving stakeholders, Kabul Municipality should provide some awareness programs such as training, workshops, and installing informative billboards in residential neighborhoods.
- In order to discourage the further practice of apartment buildings in the planned residential districts, taxes should be increased and the disallowed floors should be confiscated.

Some solutions to the above problems can only be applied in specific cases; however, to reverse the situation, the source of the problem must be removed. One solution is to reverse the main layout in the study area based on the primary design in a detailed plan. The main layout of the study area should be based on the cul-de-sac streets, as shown in the detailed plan. In this case, the green stripe returns to its original shape. Therefore, a significant area for recreation and other uses will be provided.

The space can also provide children with a specific area to play, and the sound they create will be concentrated in a specific area. Such a space may be helpful for houses that do not normally receive direct sunlight during the day. The width of the green stripe in Figure 11 should be approximately 25 m. These types of green strips are frequently included with detailed plans for the city of Kabul.

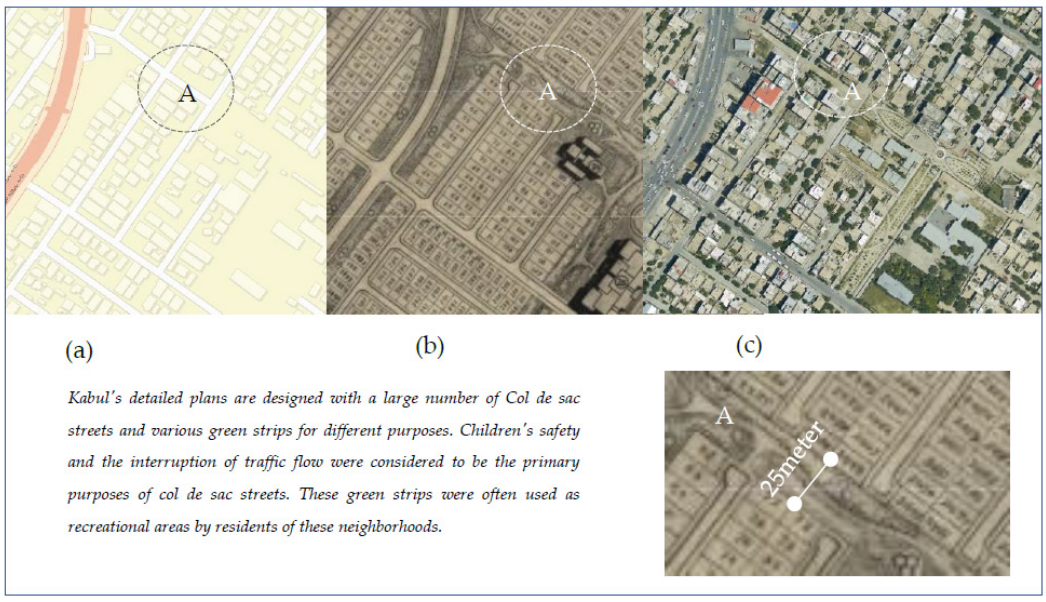


Figure 11. Structure layout differences; (**a**) focused map road; (**b**) detailed plans designed in late 1970s; (**c**) aerial photograph.

Meanwhile, to reduce smoke that contributes to air pollution, the quantity of emissions from a heating system could be reduced through the use of a filtration system. It is critical to remove wood particles and charcoal smoke from the air. This can be achieved by deploying an effective filtration system for the removal of small particles. In apartment buildings, in particular, filtration systems have the potential to reduce the amount of smoke leaving the building.

Privacy as an important social issue is difficult to address. Most of the zones planned around Kabul are designed according to the detailed plan concept. One of the strictest rules in the past was to keep the interior of the house out of sight. As apartment buildings started to emerge, it became evident that those rules were not as intended. Today, any changes to the area would not make a significant difference. As an alternative, residents may install invisible windows to block the view of the inside of the apartments during the day. A little relief might come from the municipality of Kabul by applying human-headed window restrictions on the direct sides of the buildings.

At the same time, residents still need to use artificial lights to reduce their visual discomfort. Kabul benefits from plenty of sunshine, allowing the installation of solar panels on rooftops. Renewable energy sources remain the most effective way to meet the growing demand for electricity [101]. Momand's research indicates Afghanistan has the highest solar energy capacity in South Asia [102]. As a result, solar energy is the most efficient form of supplying artificial light and reducing wood and coal combustion. Residents' health and living conditions could be improved somewhat by the aforementioned solution. However, removing the impact will only be possible if the cause of the problem is removed.

6. Conclusions

Uncontrolled urbanization leads to chaotic development, particularly in underdeveloped countries. Kabul, as the capital, was also affected by urban development, which resulted in a transformation in housing types. In the last two decades, apartment buildings in low-rise residential zones increased in 1970 Master Plan-based planned neighborhoods. The transformation of houses as a result of building substitution densified residential areas. Building substitution resulted in the transformation of houses, which further densified residential areas. Kabul city's densification faced numerous urban challenges, including severe housing conditions, infrastructure shortages, and an increasing number of squatters. The appearance of these apartment buildings caused overcrowding, air pollution, traffic congestion, and an increase in sound pollution. Kabul's planned residential areas experienced densification as a result of vertical housing transformation. This resulted in a scarcity of many resources as well as increased pressure on public spaces, activities, facilities, and public spaces. The situation had a significant impact on the living conditions in the study areas, both indoors and outdoors. As a result of the transformation of houses into apartment buildings, a number of environmental and social issues have arisen. Residents' health suffered directly as living conditions deteriorated. Infectious diseases, chronic diseases, nutritional deficiencies, and mental health issues all spread as living conditions deteriorate. Our examination of the physical shape of the research areas allowed us to gain a better understanding of the study areas' precise situation. Following that, we solicited feedback from the residents to assess the impact of the housing transformation on their quality of life. Their health complaints were accompanied by diseases such as respiratory, orthopedic, asthma, headaches, fatigue, and mental and visual impairments. We established several criteria to better determine the relationship between a physical aspect and residents' opinions. Based on our criteria, we classified the issue's impacts into three categories: Critical, Fair, and Satisfactory. According to our findings, more than half of the houses are in critical condition. To avoid the construction of additional apartment buildings, it is critical to focus not only on laws and regulations, but also on their enforcement. As a result of our findings, we have proposed some solutions that may help to mitigate the impact of these issues.

7. Research Limitation

Our research has some limitations that must be acknowledged. A larger sample area would have been advantageous. It was extremely time consuming and tedious to reach out to residents and reach an agreement on questions and research. Another critical point is that we have been unable to reach all planned residential neighborhoods due to security concerns. We enquired paper-based questions instead of online questions and interviews due to a lack of internet access and knowledge. Authorities were overburdened and non-

supportive of our research. We were unable to select additional sampling areas due to financial constraints. Due to sensitive cultural reasons, we were not permitted to take photographs or conduct research from within. A lack of policies, rules, and regulations pertaining to our study hindered our research.

8. Direct of Future Research

Opportunities for future research are abundant. Our study was concentrated on planned areas; we encourage other researchers to also include an informal settlement in their study. Future research could be focused on also other environmental issues including water pollution, wastewater treatment, solid waste management, and others as a result of housing transformation. Our study contributed to helping other researchers understand the condition of detached houses. However, studies could be performed on the living conditions of the transformed buildings. Researchers can also conduct research on other aspects of issues, such as cultural and religious aspects. In particular, future research should seek to improve the satisfaction of residents in the areas by finding comprehensive solutions to the current situation.

Author Contributions: The study is the result of experimental research. Conceptualization, Data collection, research design, writing, analyzing, utilizing software such as ArcMap, AutoCAD, and SketchUp, and preparation of the first draft and final submission conducted by M.R.A. The research was supervised by J.A., particularly in writing, editing, and reviewing the final draft. All authors have read and agreed to the published version of the manuscript.

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Data Availability Statement: Kabul Municipality provided data for the research. Kabul Municipality employees were interviewed, and aerial photographs were collected during these interviews. Furthermore, shape files were also provided by the Planning Department of the Kabul Municipality. Data regarding the living conditions of residents were collected through questionnaires filled out by residents. The field trip also provided us with physical data by way of measuring, photographing, and sketching.

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References

1. Dunn, J.R. Housing and Health Inequalities: Review and Prospects for Research. *Hous. Stud.* **2000**, *15*, 341–366. [CrossRef]
2. Ojikpong, B.E.; Agbor, A.E. The Impact of Building Use Conversion on Residential Accommodation in Calabar, Cross River State Nigeria. *Int. J. Sci. Environ. Technol.* **2016**, *5*, 1445–1467.
3. Jinadu, A.M. *Understanding the Basics of Housing*; Jos University Press Ltd.: Jos, Nigeria, 2007.
4. Rolfe, S.; Garnham, L.; Godwin, J.; Anderson, I.; Seaman, P.; Donaldson, C. Housing as a social determinant of health and wellbeing: Developing an empirically-informed realist theoretical framework. *BMC Public Health* **2020**, *20*, 1138. [CrossRef] [PubMed]
5. Herrfahrdt-Pähle, E.; Schlüter, M.; Olsson, P.; Folke, C.; Gelcich, S.; Pahl-Wostl, C. Sustainability transformations: Socio-political shocks as opportunities for governance transitions. *Glob. Environ. Chang.* **2020**, *63*, 102097. [CrossRef]
6. Hirayama, Y.; Ronald, R. *Housing and Social Transition in Japan*; Routledge: London, UK, 2017; ISBN 13: 978–0–415–38361–5.
7. Aduwo, E.B.; Ibem, E.O. Housing Transformation in Government Constructed Residential Estates in Lagos Nigeria. *Int. J. Humanit. Soc. Sci. Invent.* **2017**, *6*, 13–22.
8. Khan, T.H. Explicit Reasons Behind Housing Transformation. In *Houses in Transformation*; Springer Briefs in Geography; Springer: Cham, Switzerland, 2013; pp. 1–7. [CrossRef]
9. Roggema, R. The future of sustainable urbanism: A redefinition. *City Territ. Arch.* **2016**, *3*, 22. [CrossRef]

10. Mahtta, R.; Fragkias, M.; Güneralp, B.; Mahendra, A.; Reba, M.; Wentz, E.A.; Seto, K.C. Urban land expansion: The role of population and economic growth for 300+ cities. *npj Urban Sustain.* **2022**, *2*, 5. [CrossRef]
11. Bokova, I.G. *Culture: Urban Future*; Global Report on Culture for Sustainable Urban Development; UNESCO: Paris, France, 2016; ISBN 978-92-3-100170-3.
12. OECD. Reconciling Housing and the Environment. In *Brick by Brick: Building Better Housing Policies*; OECD Publishing: Paris, France, 2021. [CrossRef]
13. Rademacher, B.A. When Is Housing an Environmental Problem? Reforming Informality in Kathmandu. *Curr. Anthr.* **2009**, *50*, 513–533. [CrossRef]
14. Fatti, C.C. Towards just sustainability through government-led housing: Conceptual and practical considerations. *Curr. Opin. Environ. Sustain.* **2022**, *54*, 101150. [CrossRef]
15. Remali, A.M.; Salama, A.M.; Wiedmann, F.; Ibrahim, H.G. A chronological exploration of the evolution of housing typologies in Gulf cities. *City Territ. Arch.* **2016**, *3*, 14. [CrossRef]
16. Önder, M.S. Social Impact of the Urban Transformation (Diyarbakir Sampe). In *Recent Ideas and Research in Social Sciences*; EUSER: London, UK, 2016. [CrossRef]
17. Ige, J.; Pilkington, P.; Orme, J.; Williams, B.; Prestwood, E.; Black, D.; Carmichael, L.; Scally, G. The relationship between buildings and health: A systematic review. *J. Public Health* **2018**, *41*, e121–e132. [CrossRef] [PubMed]
18. Murray, C.J.; Aravkin, A.Y.; Zheng, P.; Abbafati, C.; Abbas, K.M.; Abbasi-Kangevari, M.; Borzouei, S. Global burden of 87 risk factors in 204 countries and territories, 1990–2019: A systematic analysis for the Global Burden of Disease Study 2019. *Lancet* **2020**, *396*, 1223–1249. [CrossRef]
19. Van Kempen, E.E.; Kruize, H.; Boshuizen, H.C.; Ameling, C.B.; Staatsen, B.A.; de Hollander, A.E. The association between noise exposure and blood pressure and ischemic heart disease: A meta-analysis. *Env. Health Perspect.* **2002**, *110*, 307–317. [CrossRef] [PubMed]
20. Ising, H.; Braun, C. Acute and chronic endocrine effects of noise: Review of the research conducted at the Institute for Water, Soil and Air Hygiene. *Noise Health* **2000**, *2*, 7–24. [PubMed]
21. Kovesi, T.; Gilbert, N.L.; Stocco, C.; Fugler, D.; Dales, R.E.; Guay, M.; Miller, J.D. Indoor air quality and the risk of lower respiratory tract infections in young Canadian Inuit children. *Can. Med. Assoc. J.* **2007**, *177*, 155–160. [CrossRef]
22. Wang, J.; Engvall, K.; Smedje, G.; Nilsson, H.; Norbäck, D. Current wheeze, asthma, respiratory infections, and rhinitis among adults in relation to inspection data and indoor measurements in single-family houses in Sweden-The BETSI study. *Indoor Air* **2017**, *27*, 725–736. [CrossRef]
23. Bornehag, C.G.; Sundell, J.; Hägerhed-Engman, L.; Sigsgaard, T. Association between ventilation rates in 390 Swedish homes and al-lergic symptoms in children. *Indoor Air* **2005**, *15*, 275–280. [CrossRef] [PubMed]
24. Gabe, J.; Williams, P. Women, crowding and mental health. In *Unhealthy Housing: Research, Remedies and Reform*; Burbidge, R., Ormandy, D., Eds.; Spon Press: New York, NY, USA, 1993; pp. 191–208.
25. Zima, B.T.; Wells, K.B.; Freeman, H.E. Emotional and behavioral problems and severe academic delays among sheltered homeless children in Los Angeles County. *Am. J. Public Health* **1994**, *84*, 260–264. [CrossRef]
26. McEwen, B.S.; Seeman, T. Protective and damaging effects of mediators of stress: Elaborating and testing the concepts of all stasis and allosteric load. *Ann. N. Y. Acad. Sci.* **1999**, *896*, 30–47. [CrossRef]
27. Sharfstein, J.; Sandel, M. (Eds.) *Not Safe at Home: How America's Housing Crisis Threatens the Health of Its Children*; Boston University Medical Center: Boston, MA, USA, 1998.
28. Selçuk, I.; Ipek, E.; Köktaş, A.M. How Housing Conditions Affect Health: Findings From the Turkish National Household Panel Survey. *Hous. Policy Debate* **2021**, *31*, 1–16. [CrossRef]
29. Ekstam, H. Residential Crowding in a "Distressed" and a "Gentrified" Neighbourhood—Towards an Understanding of Crowding in "Gentrified" Neighbourhoods. *Hous. Theory Soc.* **2015**, *32*, 429–449. [CrossRef]
30. Pevalin, D.J.; Taylor, M.P.; Todd, J. The Dynamics of Unhealthy Housing in the UK: A Panel Data Analysis. *Hous. Stud.* **2008**, *23*, 679–695. [CrossRef]
31. Bratt, R.G. Housing and Family Well-being. *Hous. Stud.* **2002**, *17*, 13–26. [CrossRef]
32. Jones-Rounds, M.L.; Evans, G.W.; Braubach, M. The interactive effects of housing and neighborhood quality on psychological well-being. *J. Epidemiol. Community Health* **2014**, *68*, 171–175. [CrossRef]
33. Shaw, M. Housing and public health. *Annu. Rev. Public Health* **2004**, *25*, 397–418. [CrossRef]
34. Rahkonen, O.; Lahelma, E.; Huuhka, M. Past or present? Childhood living conditions and current socioeconomic status as determinants of adult health. *Soc. Sci. Med.* **1997**, *44*, 327–336. [CrossRef]
35. Barskova, T.; Oesterreich, R. Post-traumatic growth in people living with a serious medical condition and its relations to physical and mental health: A systematic review. *Disabil. Rehabil.* **2009**, *31*, 1709–1733. [CrossRef]
36. Saegert, S.C.; Klitzman, S.; Freudenberg, N.; Cooperman-Mroczek, J.; Nassar, S. Healthy Housing: A Structured Review of Published Evaluations of US Interventions to Improve Health by Modifying Housing in the United States, 1990–2001. *Am. J. Public Health* **2003**, *93*, 1471–1477. [CrossRef]
37. Myhrvold, T.; Småstuen, M.C. The mental healthcare needs of undocumented migrants: An exploratory analysis of psychological distress and living conditions among undocumented migrants in Norway. *J. Clin. Nurs.* **2016**, *26*, 825–839. [CrossRef]
38. Foster, H.D. *Health. Disease and Environment*; Belhaven Press: London, UK, 1992.

39. Ineichen, B. *Homes and Health How Housing and Health Interact*, 1st ed.; Routledge Tylor & Francis Group: London, UK, 1993; p. 117. ISBN 9780419171003.
40. Lowry, S. *Housing and Health*; Bmj Publishing Group: London, UK, 1991.
41. Fuller-Thomson, E.; Hulchanski, J.D.; Hwang, S. The housing/health relationship: What do we know? *Rev. Environ. Health* **2000**, *15*, 109–133. [CrossRef]
42. Mackenbach, J.P.; Howden-Chapman, P. Houses, neighborhoods and health. *Eur. J. Public Health* **2002**, *12*, 161–162. [CrossRef]
43. Bonnefoy, X.; Braubach, M.; Krapavickaite, D.; Ormand, D.; Zurlyte, I. Housing conditions and self-reported health status: A study in panel block buildings in three cities of Eastern Europe. *Neth. J. Hous. Built Environ.* **2003**, *18*, 329–352. [CrossRef]
44. WHO Regional Office for Europe. *Housing and Health, Health and Environment Briefing Pamphlet Series 41*; WHO Regional Office for Europe: Copenhagen, Denmark, 2004.
45. CSOIRA. *Estimated Population of Afghanistan 2019-20*; Central Statistics Organization: Kabul, Afghanistan, 2020; pp. 1–319.
46. GoIRA. *State of Afghan Cites in 2015*; Government of the Islamic Republic of Afghanistan: Kabul, Afghanistan, 2015; Volume 1, pp. 1–156.
47. Bertaud, A. *Kabul Urban Development Current City Structure, Spatial Issues, Recommendations on Urban Planning*; Urban Land Management in Afghanistan: Paperzz, Afghanistan; The World Bank: Kabul, Afghanistan, 2005.
48. The World Bank. *Kabul Formal and Informal Housing, Kabul Urban Policy Note. 2&3*; The World Bank: Kabul, Afghanistan, 2006.
49. Calogero, P.A. Planning Kabul: The Politics of Urbanization in Afghanistan. Ph.D. Thesis, University of California, Berkeley, CA, USA, 2011.
50. Dave, S. High Urban Densities in Developing Countries: A Sustainable Solution? *Built Environ.* **2010**, *36*, 9–27. [CrossRef]
51. Oyón Bañales, J.L.; Guàrdia Bassols, M.; Rosselló i Nicolau, M.; Hernández Falagán, D.; Roger Gonce, J. The residential revolution of Barcelona working-class suburbs, 1939–1980: Nou barris as case study La revolución residencial de la periferia obrera en barcelona, 1939–1980: Nou barris como estudio de caso. *Scr. Nova Rev. Electron. Geogr. Y Cienc. Soc.* **2021**, *25*, 271–306. [CrossRef]
52. Alagbe, O.A.; Aduwo, E.B. The Impact of Housing Transformation on Residents' Quality of Life: A Case Study of Low-Income Housing Estate, Ipaja, Lagos. *Covenant J. Res. Built Environ.* **2014**, *2*, 2.
53. Yıldız, B.Y.; Ek, F.İ.; Can, I. Transformation in a housing design story: Reading the spatial typologies of apartment projects in Hatay-Izmir. *A/Z ITU J. Fac. Archit.* **2018**, *15*, 123–137. [CrossRef]
54. Dianati, V. The Interplay between Urban Densification and Place Change in Tehran; Implications for Place-Based Social Sustainability. *Sustainability* **2021**, *13*, 9636. [CrossRef]
55. Dener, A. *The Transformation of House Types in Istanbul in Relation to the Socio-Cultural Changes*, 33rd ed.; IAHS World Congress on Housing: Pretoria, South Africa, 2005.
56. Tipple, A.G. *Self Help Transformation in Low Cost Housing. An Introductory Study*; CARDO in Association with the International Urban Press: Newcastle upon Tyne, UK, 1991; pp. 55–76.
57. Kim, S.; Yang, I.; Yeo, M.; Kim, K. Development of a Housing Performance Evaluation Model for Multi-Family Residential Building in Korea. *Build. Environ.* **2005**, *40*, 1103–1116. [CrossRef]
58. Popkin, S.J.; Rich, M.J.; Hendey, L.; Hayes, C.; Parilla, J. Public Housing Transformation and Crime: Making the Case for Responsible Relocation. *Cityscape* **2012**, *14*, 137–160. [CrossRef]
59. Morris, E.W.; Winter, M. A Theory of Family Housing Adjustment. *J. Marriage Fam.* **1975**, *37*, 79. [CrossRef]
60. Hasan, A. *The Scale and Causes of Urban Change in Pakistan*; Ushba Publishing International: Karachi, Pakistan, 2006.
61. Tipple, A.; Owusu, E.; Pritchard, C. User-initiated extensions in government-built estates in Ghana and Zimbabwe: Unconventional but effective housing supply. *Afr. Today* **2004**, *51*, 79–105. [CrossRef]
62. Mohammed Mai, M.; Shamsuddin, S. Urbanization and globalization of Gbagyi housing transformation. *Int. J. Sustain. Trop. Des. Res. Pract.* **2007**, *1*, 49–58.
63. Avogo, F.A.; Wedam, E.A.; Opoku, S.M. Housing transformation and livelihood outcomes in Accra, Ghana. *Cities* **2017**, *68*, 92–103. [CrossRef]
64. Hallet, S.I.; Samizai, R. *Traditional Architecture of Afghanistan*; Garland STM Publshing: Oxford, UK, 1980.
65. Bechhoefer, W.B. 16. Contextual Transformations of Traditional Housing in Kabul, Afghanistan. In *Housing, Culture, and Design: A Comparative Perspective*; Low Setha, M., Chambers, E., Eds.; University of Pennsylvania Press: Philadelphia, PA, USA, 2016; pp. 335–356. [CrossRef]
66. Kazimee, B.A.; Mcquillan, J. Living Traditions of the Afghan Courtyard and Aiwan. *Tradit. Dwell. Settl. Rev.* **2002**, *13*, 23–34. Available online: https://www.jstor.org/stable/41757892 (accessed on 8 May 2022).
67. Najimi, A.W. Studies in vernacular architecture in Afghanistan: Training in conservation of historic structures in Kabul Old City. *Int. J. Environ. Stud.* **2016**, *73*, 512–523. [CrossRef]
68. Blackwell, T.; Kohl, S. Urban heritages: How history and housing finance matter to housing form and homeownership rates. *Urban Stud.* **2018**, *55*, 3669–3688. [CrossRef]
69. Azizi, M.U.; Ando, T. Transformation of the Traditional Landscape of Kabul Old City: A Study for Its Conservation. In Proceedings of the ICPUD: 21st International Conference on Planning and Design, Glasgow, UK, 11–13 September 2019; Volume 13. [CrossRef]
70. Sendi, R.; Kerbler, B. The Evolution of Multifamily Housing: Post-Second World War Large Housing Estates versus Post-Socialist Multifamily Housing Types in Slovenia. *Sustainability* **2021**, *13*, 10363. [CrossRef]

71. Guerrieri, P.M. *Negotiating Cultures: Delhi's Architecture and Planning from 1912 to 1962*; Oxford University Press: Oxford, UK, 2018. [CrossRef]
72. Hidayat, O.; Kajita, Y. Influences of Culture in the Built Environment; Assessing Living Convenience in Kabul City. *Urban Sci.* **2020**, *4*, 44. [CrossRef]
73. Ayoobi, A.W.; Inceoglu, M. Mutual Relationship of Culture and Architecture: Focused on Residential houses in Kabul City. *J. Sci. Part B Art Humanit. Des. Plan.* **2021**, *9*, 345–356.
74. Ebrahimi, M.H.; Devillers, P.; Garcia-Diaz, E. Sustainable construction for affordable housing program in Kabul. *J. Contemp. Urban Aff.* **2021**, *6*, 23–35. [CrossRef]
75. Sharifzai, M.S.; Kitagawa, K.; Halimee, M.K.; Habib, J.; Sakaguchi, D. A comparative study of Afghan traditional and contemporary courtyard housing regarding affordable planning and sustainability. *Int. J. Archit. Environ. Eng.* **2016**, *10*, 412–417.
76. Vijulie, I.; Lequeux-Dincă, A.-I.; Preda, M.; Mareci, A.; Matei, E.; Cuculici, R.; Taloș, A.-M. Certeze Village: The Dilemma of Traditional vs. Post-Modern Architecture in Țara Oașului, Romania. *Sustainability* **2021**, *13*, 11180. [CrossRef]
77. Scholz, W. Appropriate Housing Typologies, Effective Land Management and the Question of Density in Muscat, Oman. *Sustainability* **2021**, *13*, 12751. [CrossRef]
78. Khadour, N.; Basha, N.; Sárospataki, M.; Fekete, A. Correlation between Land Use and the Transformation of Rural Housing Model in the Coastal Region of Syria. *Sustainability* **2021**, *13*, 4357. [CrossRef]
79. Gaubatz, P. China's Urban Transformation: Patterns and Processes of Morphological Change in Beijing, Shanghai and Guangzhou. *Urban Stud.* **1999**, *36*, 1495–1521. [CrossRef]
80. Nabizada, T.; Kita, M. A study on the process and mechanism of transformation in settlements in kabul city. *J. Arch. Plan.* **2012**, *77*, 2533–2543. [CrossRef]
81. Samimi, S.A.B.; Ando, T.; Kawish, K. Analysis of the Transformation of Herat Old City, Afghanistan. *Conserv. Manag. Archaeol. Sites* **2019**, *21*, 143–159. [CrossRef]
82. Olubi, A.; Ayoola, H.A. Assessment of Residential Transformation in Oyo Town, Nigeria. *Environ. Technol. Sci. J.* **2020**, *11*, 1.
83. Dündar, Ö. Models of Urban Transformation: Informal Housing in Ankara, Cities. *Cities* **2001**, *18*, 391–401. [CrossRef]
84. Makachia, P.A. Evolution of urban housing strategies and dweller-initiated transformations in Nairobi. *City Cult. Soc.* **2011**, *2*, 219–234. [CrossRef]
85. Keith, M.; de Souza Santos, A.A. *Urban Transformations and Public Health in the Emergent City*; Manchester University Press: Manchester, UK, 2020. [CrossRef]
86. JICA. *Draft of Kabul City Master Plan, Project for Promotion of Kabul Metropolitan Area Development*; RECS International Inc.; Yachiyo Engineering Co., Ltd.: Tokyo, Japan, 2011.
87. Joshi, A.; Kale, S.; Chandel, S.; Pal, D.K. Likert-scale: Explored and Explained. *Br. J. Appl. Sci. Technol.* **2015**, *7*, 396–403. [CrossRef]
88. Maing, M. Superblock transformation in Seoul Megacity: Effects of block densification on urban ventilation patterns. *Landsc. Urban Plan.* **2022**, *222*, 104401. [CrossRef]
89. Ghiaus, C.; Allard, F.; Santamouris, M.; Georgakis, C.; Nicol, F. Urban environment influence on natural ventilation potential. *Build. Environ.* **2006**, *41*, 395–406. [CrossRef]
90. Ürge-Vorsatz, D.; Cabeza, L.F.; Serrano, S.; Barreneche, C.; Petrichenko, K. Heating and cooling energy trends and drivers in buildings. *Renew. Sustain. Energy Rev.* **2015**, *41*, 85–98. [CrossRef]
91. Ichinose, T.; Lei, L.; Lin, Y. Impacts of shading effect from nearby buildings on heating and cooling energy consumption in hot summer and cold winter zone of China. *Energy Build.* **2017**, *136*, 199–210. [CrossRef]
92. Yuan, M.; Yin, C.; Sun, Y.; Chen, W. Examining the associations between urban built environment and noise pollution in high-density high-rise urban areas: A case study in Wuhan, China. *Sustain. Cities Soc.* **2019**, *50*, 101678. [CrossRef]
93. Moudon, A.V. Real Noise from the Urban Environment: How Ambient Community Noise Affects Health and What Can Be Done About It. *Am. J. Prev. Med.* **2009**, *37*, 167–171. [CrossRef]
94. Münzel, T.; Sørensen, M.; Schmidt, F.; Schmidt, E.; Steven, S.; Kröller-Schön, S.; Daiber, A. The adverse effects of environmental noise exposure on oxidative stress and cardiovascular risk. *Antioxid. Redox Signal.* **2018**, *28*, 873–908. [CrossRef]
95. Zhai, T.; Wang, J.; Fang, Y.; Qin, Y.; Huang, L.; Chen, Y. Assessing ecological risks caused by human activities in rapid urbanization coastal areas: Towards an integrated approach to determining key areas of terrestrial-oceanic ecosystems preservation and restoration. *Sci. Total Environ.* **2019**, *708*, 135153. [CrossRef]
96. NEPA 2021, National, Environment Protection Agency, Government of the Islamic Republic of Afghanistan. Available online: https://www.nepa.gov.af/airpollution (accessed on 4 April 2022).
97. Gove, W.R.; Altman, I. The Environment and Social Behavior: Privacy, Personal Space, Territory, Crowding. *Contemp. Sociol. A J. Rev.* **1978**, *7*, 638. [CrossRef]
98. Lang, J. *Creating Architecture Theory: The Role of the Behavior Sciences in Environmental Design*; Van Nostrand Reinhold: New York, NY, USA, 1987; p. 278.

99. Hammond, A.L. *World Resources Institute. Environmental Indicators: A Systematic Approach to Measuring and Reporting on Environmental Policy Performance in the Context of Sustainable Development*; World Resources Institute: Washington, DC, USA, 1995.
100. Akintunde, E. Theories and Concepts for Human Behavior in Environmental Preservation. *J. Environ. Sci. Public Health* **2017**, *1*, 120–133. [CrossRef]
101. Slimankhil, A.K.; Anwarzai, M.A.; Sabory, N.R.; Danish, M.S.S.; Ahmadi, M.; Ahadi, M.H. Renewable energy potential for sustainable development in Afghanistan. *J. Sustain. Energy Revolut.* **2020**, *1*, 8–15. [CrossRef]
102. Momand, R.; Mohan, A. Potential of Solar Energy in Afghanistan. *J. Crit. Rev.* **2020**, *7*, 2644–2652.