KPU International Journal of Engineering & Technology
Volume 6, Issue 1, Mar. 2026
e-ISSN:2790-0819, p-ISSN:2790-0800

Date Received: 2023-10-02
Date Accepted: 2026-03-12
Date Published: 2026-03-30

A Study on Assessment of Socioeconomic Challenges of Houses: Converting Detached Houses into Apartment Buildings in Kabul City

SHARIF AHMAD FAIZI[1*], EZATULLAH YAQUBI[2], SALEH MOHAMMAD YARI[3] & MOHAMMAD IRSHAD ALOKOZAI[1]

[1]4th Semester Student of Master's Degree, Architecture Department, Kabul Polytechnic University, KPU campus, 5th District, Kabul, Afghanistan. Email: delyar.sharif@gmail.com,

[2]Assistant Professor, Department of Civil and Industrial Construction, Jawzjan University, Sheberghan, Afghanistan. Email: ezatullahyaqubi651@gmail.com.

[3]Professor, Architecture Department, Kabul Polytechnic University, KPU campus, 5th District, Kabul, Afghanistan. Email: saleh.m.yari@kpu.edu.af, salehmohammad.yari@gmail.com.

Abstract

In recent years, there has been a widespread trend of converting detached houses into apartment buildings. This conversion has significant social and environmental impacts. This paper examines the conversion of detached houses into apartment buildings and discusses the environmental and social issues arising from this process and its effects on residents, neighborhoods, and the environment over the past 20 years.
A case study was conducted on 50 apartment buildings in District 3 of Kabul city to identify the issues caused by the conversion of detached houses into apartment buildings. The study covers interconnected aspects such as natural ventilation, privacy, air pollution, noise pollution, sunlight, shadow impact, interior spaces, green areas, and drinking water. In addition, consultations with experts and households were conducted, which increased confidence in the validity of the findings regarding the issues and changes that have occurred during the study period (2002–2022).
The findings demonstrate that changes in housing conditions lead to significant changes in people's daily lives. Understanding the problems caused by the conversion of detached houses into apartment buildings and the resulting social changes can help guide the development of new housing options that better meet people's evolving needs and improve their quality of life.

Keywords: Air Pollution, Apartment Buildings, Detached Houses, Housing Conversion, Interior Space, Natural Ventilation, Noise Pollution, Privacy, Social Impact.

* Corresponding Author

1. Introduction

1.1 Background

Housing, as a word, which is a derivation of house, is the example that is discussed in this paper as a building and a place created to shelter humans and encompass everyday human operations. So, to fulfill the basic human needs to work, live, and be well, housing is said to be one of the most important needs of the human being, other than food. A house is not only a place where human beings stay physically, but also a location where they socialize and carry out social rituals. Housing is also a strong indicator of the development of a society, and shows the well-being and health of people.

It is necessary to address human dignity and the worth of life by providing proper housing. Although it is important, challenges in the housing supply continue to be experienced in many developing countries. Demographic and socio-economic transformations, technological changes, and socio-political interventions have been the main factors that have affected the evolution of housing in the modern world. The current age has made urbanization a significant issue in the world, especially in developing nations. The main reasons behind this scenario are rural-urban migration and the influx of migrants back to their home countries.

In the developing countries, urbanization is increasing at a high rate. The World Bank estimates that by 2035, a high level of poverty will be concentrated in urban areas. The rate of population increase in the cities has posed a great challenge to urban management. The growing sophistication of urban systems, the necessity to offer specialized services, and the decrease in social interaction of urban communities have complicated such concerns. Apartment housing as a type of urban life has gained significant discussion over the past few years since it has positive and negative consequences for communication and social interaction [6].

1.2 Research Gap and Objective

The evolution and conversion of housing in Kabul have been widely discussed by scholars. However, most previous studies have focused on the historical, cultural, and architectural aspects of housing transformation. These studies mainly examined housing conversion from an adaptive perspective, such as horizontal or vertical extensions of existing buildings.

Despite these contributions, limited research has examined the direct conversion of detached houses into apartment buildings and the environmental and social impacts of this transformation on residents and neighborhoods in planned residential areas of Kabul. As a result, an important research gap exists regarding how this type of housing conversion affects environmental conditions, social interaction, and the quality of life of residents.

Therefore, the main objective of this study is to examine the environmental and social challenges caused by the conversion of detached houses into apartment buildings in planned residential neighborhoods of Kabul city. The study focuses on understanding how these changes influence residents' living conditions, environmental quality, and social relationships.

2. Literature Review

Urban planning and architecture studies have become very concerned with housing transformation. The high rate of urbanization, population expansion, and emigration has had a great impact on residential settings in most cities worldwide. Housing conversion is one of the most widespread types of housing conversion, where detached houses are turned into apartment buildings. This has been witnessed in most of the developing countries where a growing urban population strains the housing supply and the accessible land. The recent research has focused on the environmental and social effects of housing typology conversion. Amiryar examined the housing typologies conversion in Kabul city and examined the environmental and social effects of the typology on the living conditions of the inhabitants. The paper has pointed out that the conversion of the isolated houses into apartment constructions has presented a number of environmental and social issues in the city areas, such as a lack of privacy, ecological issues, and overcrowding. Culture and social values are also close to housing [1].

According to Ozaki, the aspect of housing can be discussed as the manifestation of culture since residential space design and structure can depend on social traditions, lifestyle, and cultural requirements. Thus, any modification of the forms of housing can also indicate the more general social and cultural shifts [2]. Alterations in the built environment usually signify more social changes in society. Al-Betawi suggests that housing conversion and physical change of the buildings can be viewed as a manifestation of social change. With the development of cities and society, housing becomes adjusted to the new economic and social life requirements. [3].

Maina has also touched on the issue of the connection between housing and cultural identity, whereby residential settings have the power to affect social interaction and community life. As the traditional housing forms are substituted by new typologies of housing, the way people socialize and live their daily lives might transform [4]. On the same note, Irani looked at the social and cultural aspects of housing transitions and discovered that family organization, social practices, and economic conditions have a profound effect on housing transitions. Such aspects may create the alteration or substitution of conventional housing structures within the urban conditions [5]. The social effects of apartment housing on occupants have also been examined. With reference to the effect of apartment living on social interaction, Shabazi investigated this issue and came to the conclusion that apartment housing has been capable of transforming the conventional patterns of neighborhood relationship and communication between dwellers [6].

There has also been a housing transformation related to the urban development of cities that are rapidly developing. Al-Asad analysed the obstacles to urban development in cities with high population growth. As per this research, it is found that in the case of urban expansion, the density of buildings tends to be high, and the neighborhood structure may experience major transformation [7].

A number of researchers have also studied the cause of housing conversion. In this case, population growth, rise in land value, and economic incentives are some of the factors noted by Khan as key drivers of housing transformation. The owners of the property usually develop detached houses into apartment buildings so as to exploit the urban land

area as much as possible [8]. Government housing projects have also been characterized by housing transformation. Aduwo and Ibem examined the conversion of houses in residential estates in Lagos, Nigeria, and discovered that homeowners often convert the houses to suit more households or to generate rental income. Although such a process can potentially be used to remedy housing shortages, it can also bring forth environmental and infrastructural difficulties [9]. Social transitions are also closely related to housing transformation. Hirayama and Ronald focused on housing and social transition in Japan and highlighted that the role of demographic change, economic restructuring, and housing policies in creating housing systems and residential patterns is important [10].

Though these researches are very informative on the issue of housing transformation, most of them work on cultural, social, or architectural views. Nevertheless, there is a dearth of studies on the environmental and social effects of substituting disconnected houses with apartment complexes in premeditated housing neighborhoods in Kabul. Thus, it can be concluded that a significant research gap is still present in the analysis of how these changes in housing can affect environmental factors and the quality of life of people living in Kabul city.

3. Study Area

This study was conducted in District 3 of Kabul city, Afghanistan. According to data from Kabul Municipality, District 3 covers an area of approximately 5.95 square kilometers and contains about 8,400 residential buildings with a population of nearly 227,250 residents. This district is considered one of the important residential areas of Kabul and has experienced significant changes in housing typology during the past two decades.

District 3 was selected as the main study area because a large number of detached houses in this district have been converted into apartment buildings. This transformation has created various environmental and social challenges for residents and the surrounding neighborhoods.

Within District 3, two specific locations, Karte 4 and Dehburi, were selected for detailed investigation. These areas were chosen because the rate of housing conversion is higher compared to other parts of the district, and several environmental and social problems related to apartment construction can be clearly observed in these neighborhoods.

The selected study areas represent typical planned residential neighborhoods where detached houses were originally designed for single-family living. However, due to population growth, housing demand, and insufficient urban control, many of these houses have been converted into multi-story apartment buildings.

4. Research Methodology

This study adopts a qualitative case study research approach to examine the environmental and social impacts of converting detached houses into apartment buildings in Kabul city. The research focuses on District 3 of Kabul, particularly the areas of Karte 4 and Dehburi, where the conversion of detached houses into apartment buildings has increased significantly over the past two decades.

Data for this study were collected using several methods, including field observation, interviews with residents, and visual documentation through photographs. Field visits

were conducted to observe the physical conditions of the buildings and the surrounding environments. During these visits, the researchers examined issues such as natural ventilation, privacy, building setbacks, shadow impacts, and the availability of green spaces.

A total of 50 apartment buildings that were previously detached houses were selected as case studies. Interviews were conducted with two groups of residents: those living in the converted apartment buildings and those living in nearby detached houses. These interviews helped identify environmental and social challenges such as air pollution, noise pollution, lack of privacy, insufficient sunlight, reduced green spaces, and pressure on drinking water resources.

In addition, building layouts and site conditions were analyzed to evaluate violations of building regulations, including Building Coverage Ratio (BCR), building height, and setback requirements defined by Kabul Municipality. Photographs taken during the field survey were used as visual evidence to support the analysis of the identified problems in the study areas.

5. Results

The results of this study are based on field observations, interviews with residents, and visual analysis of buildings located in the study areas of Karte 4 and Dehburi in District 3 of Kabul city. The findings show that the conversion of detached houses into apartment buildings has created several environmental and social problems in these neighborhoods.

5.1 Air Pollution

In today's era, one of the major problems affecting urban residents is air pollution. Air pollution has negative and sometimes irreversible impacts on human health. Its consequences are not limited to humans; it also affects other living organisms, including animals and plants. In addition, air pollution can damage buildings, historical monuments, and other physical structures. Kabul city is considered one of the most polluted cities in the world due to rapid urban growth, uncontrolled construction, and the widespread use of solid fuels for heating [11].

In the study areas of District 3, air pollution is further intensified by non-standard building construction. During field observations and interviews with residents, it was found that many apartment buildings use coal and wood as primary heating sources during the winter season. The smoke produced from these fuels significantly contributes to poor air quality in the surrounding neighborhoods. In this research, air pollution was assessed qualitatively through field observations and interviews with residents regarding heating practices and perceived air quality conditions in Karte 4 and Dehburi.



Fig. 1. Air Pollution

These images show examples of severe air pollution in Kabul city. Although the photographs represent general air pollution conditions in Kabul, similar air quality problems are also experienced in the study areas of Karte 4 and Dehburi in District 3. Field observations and interviews with residents indicate that air pollution in these areas is intensified by the use of coal and wood for heating during winter.

5.2 Natural Ventilation

In order to cool a room or a building, fresh air must enter while polluted air must be expelled. There are several ways to ventilate a space, including natural ventilation by opening doors and windows, which allows air to circulate when buildings are not blocked by nearby structures.

However, during the field survey in the study areas of Karte 4 and Dehburi in District 3 of Kabul city, it was observed that many buildings are constructed very close to each other. In several cases, the distance between buildings was about one meter or even less. This small distance prevents natural ventilation inside the buildings and creates an unpleasant indoor environment in many apartments.

Although some residents use electric fans to ventilate their apartments mechanically, due to the insufficient and unreliable electricity supply in Kabul city, this solution cannot fully solve the ventilation problems of the residents.



(a) (b)

Fig. 2. These photographs show examples of apartment buildings located in the study areas of (a) Karte 4 and (b) Dehburi in District 3 of Kabul city. The small distance between buildings prevents proper natural ventilation and creates poor indoor air circulation in the residential units. (Author)

5.3 Privacy

Afghans place a high value on the veil and hijab because they believe that it is one of the most significant aspects of Islam and Muslim culture. On the other hand, everyone has the unalienable right to privacy, but the neighborhood's privacy has been destroyed by the construction of high-rise buildings that exceed the permitted height limit between residential areas. This makes it very difficult for the residents to remain in their homes. They claim that because of the surrounding buildings' complete invasion of our privacy and the ability for these structures' higher floors to look inside our rooms, we are unable to live peacefully with our families inside our homes.



(a) (b)

Fig. 3. These photographs show high-rise apartment buildings located in the study areas of (a) Karte 4 and (b) Dehburi in District 3 of Kabul city. These buildings have been constructed among low-rise detached houses. Due to their height and close proximity to neighboring houses, the upper floors overlook surrounding residential properties, which significantly reduces the privacy of nearby residents. (Author)

5.4 Noise Pollution

Noise pollution refers to unpleasant and disturbing sounds produced by human activities, vehicles, and equipment. High levels of noise can negatively affect human health and may lead to hearing problems, stress, and other health issues. According to the building regulations of Kabul Municipality, when constructing a building on private land, at least 40% of the plot should remain open as green space so that the building is set back from the road and protected from external noise sources. However, in many apartment buildings located in the study areas, this regulation has not been followed, and buildings occupy almost the entire plot area.

As a result, many residential units are located very close to public roads. Residents reported that traffic noise from cars, motorcycles, and street vendors directly enters their homes during both day and night. In addition, the distance between some buildings is extremely small, which allows sounds from neighboring apartments to be easily heard, creating disturbances and reducing privacy.

In this research, noise pollution was assessed qualitatively through field observations and interviews with residents in the study areas of Karte 4 and Dehburi in District 3 of Kabul

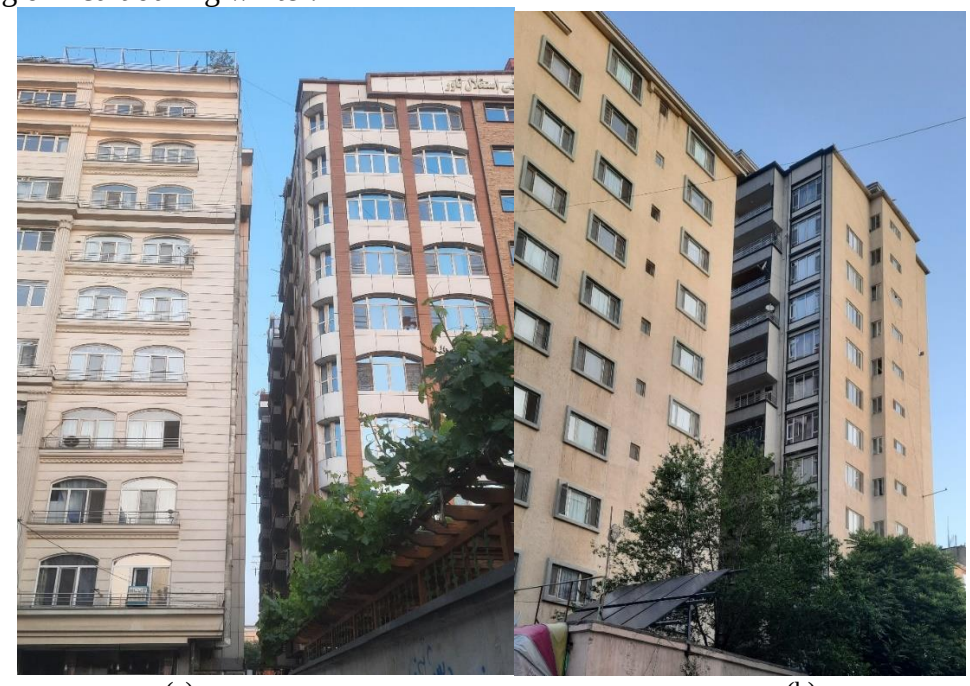
city. Residents were asked about their experiences with noise levels and the sources of disturbing sounds in their neighborhoods.

5.5 Shadow Impact

Every country has specific building regulations based on its climate, including regulations related to the distance between buildings in order to ensure proper sunlight access. In winter, the shadow of one building should not fall on the elevation of another building and should not block sunlight from reaching neighboring buildings.

However, most of the buildings constructed in District 3 of Kabul during the past two decades have not followed these regulations. Field observations in the study areas of Karte 4 and Dehburi show that many apartment buildings are constructed very close to each other and with irregular orientations. Most of these buildings are oriented parallel to the street rather than according to climatic design principles. As a result, taller buildings cast long shadows on adjacent buildings and nearby streets during the winter season.

In several cases, the shadow of these high-rise buildings falls directly on neighboring houses and side roads, reducing sunlight access and creating icy road conditions that make driving difficult during winter.



(a) (b)

Fig. 4. Due to the proximity of these buildings, which are located in Karte 3, the shadow of one falls on the apartments of the other building, and the apartments of the second building are deprived of sunlight. (Author)

5.6 Sunlight

Sunlight plays an important role in human health, as exposure to sunlight helps the human body produce vitamin D and strengthens the immune system. Lack of sunlight may lead to vitamin D deficiency and other health problems. One of the problems caused by the

construction of high-rise apartment buildings in residential areas is the creation of shadows on neighboring buildings, which prevents adequate sunlight from reaching them. Field observations in the study areas of Karte 4 and Dehburi in District 3 of Kabul city indicate that the distance between many apartment buildings ranges from approximately 12 to 15 meters. Most of these buildings are oriented parallel to the street rather than according to climatic design principles. Due to the height of the buildings and their orientation, long shadows are cast on neighboring buildings, which reduces sunlight access for nearby residential units.



Fig. 5. (Author) location Karte 4

5.7 Energy Consumption

Equipment connected to heating and cooling systems, water supply facilities, and lighting systems is the main energy-consuming component in residential buildings. Kabul city has a relatively cold climate with long winters. Traditionally, houses in Kabul were designed and oriented in such a way that sunlight could enter interior spaces during winter and help warm the houses naturally.

However, in many of the apartment buildings observed in the study areas, this climatic design principle has not been properly considered. As a result, residents rely more on artificial energy sources for heating and ventilation.

Field observations and interviews with residents indicated that most of these buildings do not use proper thermal insulation materials in walls and roofs. Residents reported that their apartments become very cold during winter and very hot during summer. Due to the lack of thermal insulation and limited natural sunlight, residents are forced to use additional heating and cooling systems, which increases overall energy consumption.

5.8 Darkness in Interior Spaces

In order for a building to be naturally illuminated, it must be far enough away from its neighboring buildings, but there are high-rise residential buildings in the third district that are only open from one side, and inside the public corridors of these buildings were completely dark, and nothing could be seen without artificial light. This problem did not only exist in the public corridors, but some of the interior spaces of these buildings also faced such a problem, and their residents had to use artificial lighting to light up their rooms even during the day.

5.9 Reduction in Quality of Life

In detached houses where one or two families used to live in the past, after being converted into apartments, apartments are planned for 15 to 30 families on the same land. It has caused a decrease in the quality of services and facilities in the same area, such as less electricity, less drinking water, less green space, less health services, more traffic congestion, more garbage, and dozens of other problems.

5.10 Destruction of Green Spaces

Normally, detached houses have a garden and a green space where the trees can provide the family with the oxygen they need and absorb the carbon they produce. However, when these houses become residential blocks, the first thing that happens in the area is cutting down the trees and destroying the green space, which increases noise pollution, air pollution, climate change, and many other problems.



Fig. 6. Location: Karte 4 and Dehburi, District 3, Kabul (Author)

Detached houses in Kabul traditionally included gardens and green spaces with trees that provided shade and improved environmental conditions for residents. However, during the field survey in the study areas of Karte 4 and Dehburi in District 3 of Kabul city, it

was observed that many of these green spaces have been removed in order to construct apartment buildings and parking areas.
Interviews with long-term residents also confirmed that many trees that previously existed in these residential plots were cut down during the construction of apartment buildings. As a result, the amount of green space in these neighborhoods has significantly decreased, which has negatively affected the environmental quality of the area.

5.11 Decreasing Drinking Water and getting it polluted

As a result of the increase in population density in these areas, underground water resources have significantly decreased and, in some locations, are close to drying up. According to information obtained from residents, the groundwater level that previously existed at a depth of about 15 meters has now reached approximately 70 meters.
One of the main reasons for this situation is the conversion of detached houses into apartment buildings. Previously, one detached house was usually occupied by one or two families. However, after conversion into apartment buildings, the same plot of land now accommodates between 15 and 30 families. This significant increase in population density leads to a higher demand for drinking water and consequently increases groundwater extraction.
Another problem is that some of the apartment buildings constructed in recent years have sewage wells that are not properly insulated, which has increased the risk of groundwater contamination.

5.12 Moving Away from Nature

Apartment dwellers are typically less attracted to nature and more focused on controlled built-up environments. Up until recently, Kabul residents were able to maintain a connection to nature through their homes' private gardens and balconies. Direct interaction with nature piqued people's attention. Family members used to get together throughout the summer to enjoy the outdoors and the fresh air while spending enjoyable time together. Nowadays, closed areas play a more important role, whereas open and semi-open spaces lose their importance and presumably a portion of their original function. This idea can be generalized, given the lack of public open areas.

6. Discussion

The conversion of detached houses into apartments has become increasingly common in recent times, particularly in densely populated urban areas. This trend entails converting the existing structure of a house into separate dwelling units to be occupied by multiple families or individuals. Such a conversion can have both positive and negative social impacts.
On the one hand, the creation of more housing alternatives through the conversion of detached homes into flats may assist to ease housing shortages and lessen homelessness. Building flats may also aid in advancing urban development, which will enhance employment prospects and spur economic growth. Additionally, apartments frequently provide more affordable housing alternatives, making it possible for families and individuals to live in upscale areas that they may not otherwise be able to afford.

On the other hand, the conversion of detached homes into apartments may also have detrimental social effects on the neighborhood. One big problem is that it frequently results in overpopulation, which increases noise, parking concerns, energy consumption, and traffic congestion. Additionally, the construction of flats could have a detrimental effect on the neighborhood's current cultural or visual environment. A weaker feeling of community might also result from the proliferation of apartments, as occupants frequently have little contact with their neighbors.

As well as, there may be conflict amongst the current occupants if detached homes are turned into flats. A clash of cultures and a collapse of community cohesion can result from the process, which frequently draws in new inhabitants who may have different lives and tastes.

However, creating flats from detached homes can also pose societal problems. Long-term inhabitants being uprooted is a worry, particularly in gentrifying districts. When single-family homes are converted into apartments, the rents or selling prices are frequently higher, which can drive away occupants with lesser incomes. Additionally, the building and remodeling necessary to turn homes into flats can disturb nearby communities and lower the quality of life for locals.

In conclusion, the conversion of detached houses into apartment buildings can have both positive and negative social impacts, depending on how the conversion is implemented. It is important for policymakers to carefully consider the social implications of such developments and ensure that the conversion is carried out in a sustainable, well-planned, and socially balanced manner. Proper urban planning and management are necessary to ensure that such developments provide the best outcomes for residents and other stakeholders.

7. Recommendations

To reduce the environmental and social impacts caused by the conversion of detached houses into apartment buildings in Kabul city, the following recommendations are proposed:

1. Kabul Municipality should strictly enforce existing building regulations related to building height, setbacks, and Building Coverage Ratio (BCR).
2. A minimum distance between buildings should be maintained to ensure adequate natural ventilation and sunlight access.
3. Building orientation should follow climatic design principles to maximize sunlight during winter and improve indoor comfort.
4. The conversion of detached houses into apartment buildings in planned residential neighborhoods should be regulated through urban planning policies.
5. Developers should be required to allocate a specific percentage of land for green spaces and open areas.
6. Existing trees and green spaces should be preserved during construction to maintain environmental quality.
7. Thermal insulation materials should be used in residential buildings to reduce excessive energy consumption.

8. Sustainable building design principles should be implemented in new residential developments.
9. Public awareness programs should be organized to educate residents and developers about environmental impacts and sustainable housing practices.
10. Traffic management strategies should be introduced to reduce congestion and noise pollution in residential areas.
11. Proper wastewater management systems should be installed to prevent groundwater contamination.
12. Groundwater extraction should be monitored to prevent excessive depletion of underground water resources.
13. Building permits should only be issued after verifying compliance with urban planning regulations.
14. Regular inspections by municipal authorities should be conducted to ensure compliance with building standards.
15. Future urban development plans should prioritize balanced residential growth, environmental protection, and improved quality of life for residents.

References

[1] Amiryar, "A Study on Conversion of Housing Typology and its Environmental and Social Impacts on the Living Condition of Residents in Kabul City," Urban Science, 2022.
[2] R. Ozaki, Housing as a Reflection of Culture. Carfax Publishing, 2002.
[3] Y. Al-Betawi, "Conversion in the Built Form as a Reflection of Social Change," ResearchGate, 2020.
[4] J. Maina, "Housing and Culture," West African Journal of Buildings, 2015.
[5] Z. Irani, "The Impact of Social and Cultural Factors in Housing Transition in Iran," ResearchGate, 2016.
[6] A. Shabazi, "Apartment Housing Impacts on People Social Interaction," Current World Environment, 2015.
[7] M. Al-Asad, "Amman: The Challenges of Continuous Growth," in Urbanization and the Changing Character of the Arab City, Economic and Social Commission for Western Asia (ESCWA), United Nations, New York, NY, 2005.
[8] T. H. Khan, "Explicit Reasons Behind Housing Conversion," in Houses in Conversion, Springer Briefs in Geography, Springer, Cham, Switzerland.
[9] Y. Hirayama and R. Ronald, Housing and Social Transition in Japan. London, UK: Routledge, 2017.
[10] E. B. Aduwo and E. O. Ibem, "Housing Conversion in Government Constructed Residential Estates in Lagos, Nigeria," International Journal of Humanities and Social Science Invention, vol. 6, pp. 13–22, 2017.
[11] United Nations Environment Programme (UNEP) and World Bank, Air Pollution and Environmental Challenges in Kabul, 2019–2020.