



The Impact of Urbanization on Cultural Heritage Buildings in Jordan: As-Salt as a Case Study

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ABSTRACT

Uncontrolled urbanization in developing countries provides opportunities to create changes in cultural heritage. However, the relationship between the urbanization process and changes that appeared over time in cultural heritage buildings needs to be thoroughly investigated and empirically examined. This paper fills this gap by examining As-Salt in Jordan as a city inscribed on the World Heritage List. A cross-sectional survey methodology was adopted to collect data. The findings reveal that urbanization has led to physical changes in heritage buildings at a medium level. The number of occupants and rental revenues have contributed significantly to changes in heritage buildings. The study suggests that the impact of urbanization on heritage buildings can be controlled if urban policies consider the socioeconomic benefits of heritage buildings for residents. Future research is encouraged to further explore the topic by examining other cities in the Middle East since comparative research can enrich knowledge and improve urban policies to manage cultural heritage efficiently.

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1. INTRODUCTION

Urbanization is a universal phenomenon that cannot be avoided, particularly in developing countries. According to a report on world urbanization prospects issued by the United Nations (2018), 55% of the world's population living in urban areas, and by the year 2050, 68% of the world's population will be living in urban areas. The urbanization process in many developing countries is often rapid and uncontrolled, leading to transformations in land use and landscape (Alnsour, 2016). Built heritage is often at risk from economic, social, and local transformations that result from the urbanization process and lead to changes in form, function, and value of built heritage over time (Akil et al., 2022; Ashrafi et al., 2021; Adie & Amore, 2020; Guzman, 2020; Udejaja et al., 2020; Trillo et al., 2020; Agapioua et al., 2015; Eken et al., 2019; El Menchawy et al., 2011; Al-Houdalieh & Sauders, 2009). Such transformations resulting from urbanization are aggravated by urban planning gaps and a need for more financial resources to preserve heritage value (Chigudu & Chavunduka, 2021; Alnsour, 2011). Kiruthigan and Thirumaran (2019) argue that urbanization threatens most heritage sites in terms of architectural style and cultural-historical value. Agapioua et al. (2015) agreed that urbanization threatens archaeological resources; therefore, acceptable policies are required to meet destruction.

The reports and studies during the last decade emphasize how the evolving principles of cultural heritage conservation correlate with the global trend of urbanization (Vinas, 2020). The UNESCO Historic Urban Landscape (HUL) recommendation is a landmark in considering cultural heritage as a social, cultural, and economic asset (UNESCO, 2011). The HUL is a comprehensive approach to urban development planning that concerns physical infrastructure, socioeconomic considerations, urban governance, and cultural values by providing practical tools to protect heritage sites and manage urbanization (Adie & Amore, 2020; Hosagrahar et al., 2016; Al Rabady et al., 2014). Such practical tools can take different forms: plans, community participation, regulations, awareness, institutional capacity, and information quality (Dameria et al., 2022). For example, Chi-man Hui et al. (2021) linked urban planning practices through community participation and urban vitality and their influence maintenance cultural heritage of Xiamen in China. Even though urbanization in most developing countries has led to a decline in cultural heritage sites, outputs of HUL are still carried out in many heritage sites worldwide (Guzman, 2020; Zhang et al., 2018). These international efforts offer opportunities for maintaining sustainable relations between cultural heritage conservation and urbanization management (Vinas, 2020). In the same context, Husnéin (2017) confirms the importance of link between cultural heritage conservation and sustainable urbanization. As a result, built cultural heritage, which

can be viewed from different urban perspectives such as geometric (i.e. regeneration and conservation), social (i.e. values and traditions), environmental (i.e. sustainability) and economic (i.e. tourism receipts), is coexisted with the urbanization process that is a source of challenges for these perspectives.

The increasing pressure of urbanization around heritage buildings in the world is a key driver to occur changes in built heritage. The investment of heritage properties for residential and commercial purposes often leads to extend the space. The question of what is a sustainable change according to standards of original value of heritage building. Original value is likely to disappear with random physical changes, particularly if buildings suffer from a lack of maintenance. Changes also could appear in buildings materials, and colour, or they hinder the existing built heritage, or even impacts negatively on structure form. For sustainable changes, repairs and extensions should be in compatible with global standards and should be implemented by the related institutions.

Jordan has distinctively experienced a high urbanization rate. In 2021, Jordan's urbanization rate was estimated at 91.63%, with a population of 10,854,000 (Department of Statistics, 2022). Rapid urbanization has given rise to several spatial, environmental, and socioeconomic challenges in the Jordanian community (Alnsour, 2016 & Meaton and Alnsour, 2012). In most urban areas of the country, such as As-Salt city, heritage buildings are frequently surrounded by new urban activities (Alnsour, 2011). These activities influence the historic and symbolic value of these heritage buildings. Zhang et al. (2018) argue that the rapid disappearance of national heritage has become a common side effect of urbanization. Given this discussion, the importance of linking both urban policies and cultural heritage policies to the socioeconomic needs of people.

According to Fan (2012), many existing urban studies on the relationship between place and urban activities have focused on driving forces and consequences rather than evaluating planning practices for addressing this relationship. Despite the importance of the relationship between urbanization and built heritage, this topic has been less investigated in developing countries (Ashrafi et al., 2021; Guzman, 2020; Udejaja et al., 2020; Mubaideen & Al Kurdi, 2017; Abu-Khafajah et al., 2016; Hyasat, 2015; Al Rabady et al., 2014; Alnsour, 2011; Al-Houdalieh & Sauders, 2009). Understanding changes in cultural heritage buildings resulting from urbanization can improve knowledge. However, this study can enhance the ability of concerned institutions in developing countries, particularly Jordan, to benefit from empirical findings. Therefore, it has the potential to introduce a policy addressing the management of urbanization in the context of cultural heritage. To achieve such a contribution, this study aims to understand the impact of urbanization on cultural heritage buildings from a

holistic perspective taking into account the following methodological phases:

We conceptualize how the urbanization process leads to changes in cultural heritage buildings based on the dynamics of change.

We estimate the level of changes that occurred in cultural heritage buildings.

We examine the impact of urbanization factors on changes in cultural heritage buildings in the study area.

THE THEORETICAL FRAMEWORK

Over the past decades, many studies have examined the relationship between urbanization and cultural heritage (e.g., Alqahtany & Aravindakshan, 2021; Kristy, 2018; AbdelMaksoud et al., 2018; Kiruthiga & Thirumaran, 2019; Beatriz & Francisco, 2018; Agapiou et al., 2015; Pereira Roders & van Oers, 2011; Tweed & Sutherland, 2007). These studies are well-established implications for conserving and managing cultural heritage through urban planning, which links physical heritage characteristics and local context from socioeconomic, spatial, cultural, and environmental perspectives. Nonetheless, the majority of these investigations have failed to establish a clear cause-and-effect relationship between the process of urbanization and constructed cultural heritage. What sets this study apart is its comprehensive assessment of causality, which distinguishes it from prior research. Furthermore, this study is conducted in an unprecedented context where there is a dearth of research on cultural heritage in Jordan. As per Scopus database, until now, only 215 papers have been published regarding cultural heritage in Jordan. Regrettably, most of these works do not delve into the correlation between the process of urbanization and built cultural heritage.

Rapid urbanization has resulted in a decline in the cultural heritage buildings in As-Salt (Alnsour, 2011), whereas locals tend to invest in heritage buildings rather than caring about the heritage ones; thus, nowadays, many buildings are in a decayed state and need maintenance, (Trillo et al., 2020, p. 214). Fakhoury and Haddad (2017) found that changes in cultural heritage buildings resulting from rapid urbanization in As-Salt are noticeable. Therefore, urban policies need to address changes in the built cultural heritage suitably. These changes in the cultural heritage buildings led to negative consequences for the historical and cultural identity of the city (Al-Bqour, 2020). Therefore, the Municipality of Greater As-Salt, in cooperation with JICA, tended to rehabilitate several remarkable heritage buildings, aiming to maintain the heritage identity of the city. In

addition, the municipality executed several works to protect heritage buildings, such as the rehabilitation of commercial use of several heritage buildings and the pavement of some streets between heritage buildings.

The Jordanian government plays a crucial role in conserving the historic buildings in As-Salt. It has implemented various laws and regulations to protect these heritage sites from the impacts of urbanization. The Jordanian Antiquities Law, for example, provides legal protection to cultural and archaeological sites, including buildings and monuments. In addition to the laws, the government has also established several initiatives and programs to conserve and restore historic buildings in As-Salt. Despite these efforts, rapid urbanization over time increases the demand for space to meet residential and commercial needs (Alnsour, 2016).

Residentially, the house to live in is often influenced by space to accommodate the occupants. The increase in the number of occupants provides opportunities to increase demand for space vertically and horizontally, leading to changes in the external form, internal design, and building materials for heritage buildings. Hence, it is reasonable to examine such relationship as follows:

H1: The number of occupants directly impacts on changes in cultural heritage buildings.

Commercially, increased demand for space leads to increased land value. Increasing services and infrastructure aggravate this. Hence, the land becomes more transferable from residential use to commercial use by local authorities to satisfy peoples' needs. In this context, the economic value of land can be defined as land rent (El Araby, 2003). Land rent can be described as the economic return that accrues or must accrue to land for its use (El Araby, 2003). According to O'Sullivan and Gibb (2012), homeownership has economic benefits, including taxation, increased wealth accumulation, and an improved labour sector.

The availability of services and space influences the supply and demand for commercial use in heritage buildings, and the interaction between supply and demand determines rental revenue. In the city of As-Salt, owners of heritage buildings often rent their properties for commercial and residential purposes (Hyasat, 2015). Commercial use is a source to generate reasonable income for both tenants and owners (Al-Bqour, 2020). To increase rental revenue, owners often change their heritage properties' external form and interior design (Hyasat, 2015).

Residential use is rented by low-income people (Hyasat, 2015). Therefore, rental revenue from commercial and residential uses of heritage buildings is expected to provide opportunities for emerging changes in heritage buildings. This relationship can be hypothesized as follows:

H2: Rental revenue resulting from cultural heritage buildings increases the changes in cultural heritage buildings.

Urbanization brings both chances and challenges, predominantly in the realm of cultural heritage conservation. As the world experiences rapid urbanization, the preservation of cultural heritage buildings becomes increasingly critical (Fu et al., 2023). In the context of global urbanization and heritage conservation, characterized by rapid urban growth, has far-reaching insinuations for cultural heritage worldwide (Ashrafi et al., 2021; Wang et al., 2020; Rössler & Lin, 2018).

Regarding the position of heritage protection, Wangfang and Wennan's study (2019) emphasizes the implication of heritage protection in the context of new urbanization trends. Their research highlights that the protection of cultural heritage, counting rural industrial heritage, is important for preserving a nation's industrial civilization (Wangfang & Wennan, 2019). This underlines the value of protection of cultural heritage in the face of urbanization.

In the process of urbanization, the protection of intangible cultural heritage faces multifaceted challenges, including insufficient government investment and the risk to heritage inheritors (Qi, 2019). The study by Qi (2019) highlights these issues and suggests measures such as government leadership, talent development, and effective publicity to address these challenges.

To delve deeper into the effects of urbanization on heritage characteristics, Kiruthiga and Thirumaran's study (2019) on historical heritage buildings in Kumbakonam, India, provides valuable insights. Their research utilizes an ordinal regression model to identify the specific physical, socioeconomic, and sociocultural issues of urbanization that influence heritage characteristics. Alqahtany and Aravindakshan's study (2021) on urbanization in Saudi Arabia sheds light on the trade-offs between heritage site conservation, population growth, and economic

demands resulting from increased urbanization. Their findings highlight the challenges faced by governments in balancing these competing interests. Finally, Ombeni et al., study (2021) on urban heritage conservation in Surat, India, emphasizes the need for thoughtful integration of sustainable heritage urban conservation into local development frameworks. It also highlights the position of recognizing the plurality of heritage values in the urban context.

3. RESEARCH METHODOLOGY

3.1 THE CASE STUDY

Jordan has a remarkable wealth of historic sites and buildings inscribed on the World Heritage List (WHL). As-Salt is a city in Jordan that holds an important place in the country's history and culture, with a population of 170,000 inhabitants (Department of Statistics, 2022). The city is located northwest of Amman (Figure 1), the capital of Jordan.

As-Salt was once the capital of Trans-Jordan and a significant trade centre during the late Ottoman period, experiencing a "Golden Age" between the 1860s and the 1920s (Hyasat, 2015). This period of prosperity attracted urban merchants from cities like Nablus, Beirut, Damascus, and Jerusalem, leading to the growth of trade, agriculture, and cultural exchange (Hyasat, 2015). As-Salt is famous for its unique architecture, combining local yellow stone with original and European styles, and its tolerance, hospitality, and social welfare traditions (Alnsour, 2011). In addition, the city was recently listed as a UNESCO World Heritage Site for its outstanding universal value, intercultural exchanges, urban form, and cultural traditions associated with the "Golden Age."

To ensure the preservation of the city's heritage, the As-Salt Greater Municipality has established the As-Salt City Development Projects Unit (ASCDP) and added a

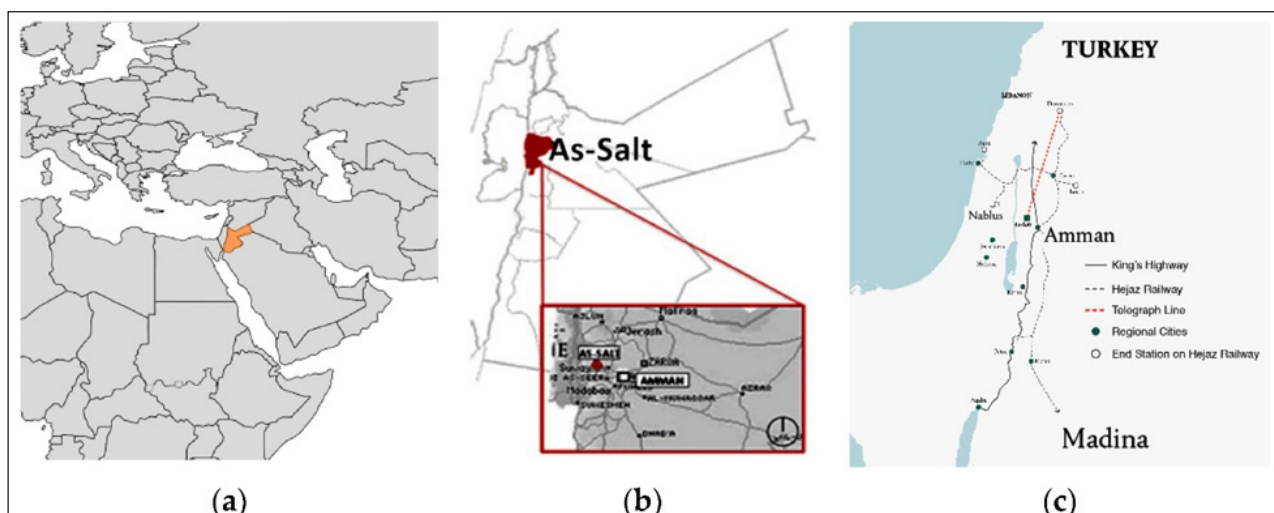


Figure 1 (a) Jordan location within the MENA region, (b) As-Salt location. (c) Mapping Security & Ottoman Reforms during the golden era (Communication, Road & Rail Networks). Source: El Faouri & Sibley, 2021, p.5.

Heritage Section to coordinate efforts in safeguarding, conserving, and managing the city's heritage (UNESCO, 2021). In addition, the Ministry of Tourism and Antiquities, in coordination with the World Bank, Euronet Consulting, and Dar Omran, has developed the Special Regulations project, a five-volume study, to provide guidelines for the conservation and management of four historic towns in Jordan, including As-Salt (El Faouri & Sibley, 2021). The City Core Special Regulations were approved in 2014 and contained 16 articles to regulate the process for permits of demolition, alterations, and conservation and rehabilitation works (UNESCO, 2021).

The As-Salt Greater Municipality has implemented a classification system for historic buildings in the city based on five tiers, from Grade I to Grade V. Grade I buildings are considered to be of significant importance to the architecture, history, and cultural heritage of both Jordan and As-Salt and must be preserved and restored to their original state (UNESCO, 2021). On the other hand, Grade V buildings are of limited value, and their loss would be minor. The ASCDP regulates the permit process and performs supervision and monitoring during the implementation of projects.

The historic city core of As-Salt is facing threats from development and urban encroachment, as well as demolition or insensitive additions to historic buildings. The As-Salt Greater Municipality has implemented urban heritage regulatory tools, such as the City Core Special Regulations and the designation and grading of historic buildings, to manage, protect and conserve the city's heritage (UNESCO, 2021). Insensitive additions are mitigated through a design review process. As a result, the property is not facing environmental pressures, but there is a risk of seismic events (El Faouri & Sibley, 2021). Research has shown that businesses in As-Salt are less aware of the potential income from tourism, but the condition of tourism has improved over time (El Faouri & Sibley, 2021; Fakhoury & Haddad, 2017; Alnsour, 2011). The number of tourist facilities is expected to increase with the property's inscription on the World Heritage List, and the municipality has increased parking facilities outside the historic core (El Faouri & Sibley, 2021). However, to overcome the threats and build a solid tourism-friendly basis, we will focus on the effect of the status of the historic buildings of the City Core and its relation to urbanization. This phenomenon is affecting As-Salt in the historical overview we listed earlier. In this context, it might be necessary to explain that tourism is one of the driving forces for urbanization. Mullins (2003) defines tourism urbanization as a process in which cities are constructed or regenerated for leisure and pleasure, and thus urbanization is closely linked to tourism-related industries (Mullins, 1991, 1992). Hence, the relationship between urbanization and tourism does not necessarily mean urban tourism (Mullins, 2003). Urban tourism concerns the city as the destination, rather than the

product of tourism that provides spaces, opportunities, and facilities to attract people to live and work.

3.2 MEASUREMENT OF VARIABLES

This study is concerned with examining the impact of urbanization on heritage buildings. The dependent variable is the changes to heritage buildings (i.e., external form, internal design, space, and building materials) due to urbanization. Based on Kiruthigan and Thirumaran (2019, p. 98–99) have measured the percentage of changes made in heritage scale using ordinal scale (i.e. low, medium, and high changes), this study measures the changes by a five-point scale to measure the level of changes to heritage buildings as shown in Table 1.

Owners of heritage buildings can be determined the

CATEGORIES OF CHANGE	LEVEL OF CHANGE
– Buildings with very minor changes	Low
– Buildings with minor changes	
– Buildings with medium changes	Medium
– Buildings with major changes	High
– Building with very major changes	

Table 1 Measurement of variables.

level of changes through the questionnaire, as well as photos can also help in understanding and interpretation of these changes. Elements of the dependent variable can be explained as follows:

External form: refers to the external image of heritage buildings. Literature on heritage buildings (e.g., Alnsour, 2011; Tweed & Sutherland, 2007) divides the image into physical and mental images. Physical image can be seen by architectural style and aesthetic elements that display the built heritage's uniqueness and attractiveness (Alnsour, 2011). The mental image combines feelings and attitudes toward the built heritage (Alnsour, 2011). This study is concerned with physical image, the original image of a heritage building that includes exterior design, decoration, arches, windows, doors, the colour of stone, beauty, and uniqueness.

Internal design: refers to the changes in the interior heritage building, including interior division, design, corridors, distribution of rooms, colours, roof, kitchen, and bathrooms.

Space: refers to the area in a square meter of each building. According to As-Salt Development Corporation (1990), change to space for heritage buildings can be ranged from very minor to very major.

Building materials: refer to the level of change in building materials used in heritage buildings. The second variable is the number of occupants, which refers to the number of individuals who live in each building. This variable can be measured by ratio scale. Furthermore, the third variable is rental revenue which refers to the total income from renting each building, whether commercial or residential, in Jordanian Dinar per year. Again, this variable can be measured by ratio scale.

3.3 DATA COLLECTION & SAMPLE

This study uses quantitative method to achieve its objective. Thus, a questionnaire survey was designed to collect data. The initial information focused on the following axes: 1) What are the changes that occurred in heritage buildings? 2) What is the level of changes in heritage buildings? 3) What are the factors that contributed to changing in heritage buildings? What are the solutions to reduce of changes heritage buildings from residents' perspective?

The questionnaire consists of three sections. The first section (Sociodemographic information) consisted of five single-choice questions on gender, homeownership, education, age, and income level. The second part (evaluation of the owners for heritage buildings) includes evaluating the current status of heritage buildings, external form, internal design, space, extensions, and building materials. This part also includes examining heritage experience, which asks owners whether they do maintenance and whether they have any experience with the maintenance of heritage buildings. The third section (attitudes and reasons for changing in heritage buildings) included the cost of changes, the number of occupants, and revenues generated from the investment of heritage buildings, as well as this section included whether owners supported the changes in heritage buildings, their justifications for doing so, or their justification for not doing so.

The questionnaire was distributed during the period from November 2021 to April 2022. Residents did not receive any financial support for participating in this

study, and the questionnaire was designed in Arabic to ensure that residents fully understood the questions. In addition, the study adopted a quantitative method employing a cross-sectional survey to collect data. Nevertheless, the findings provide valuable information for urban policymakers to improve cultural heritage buildings and maximize the benefits generated by heritage buildings.

The research population of this study is all heritage buildings in the city of As-Salt, estimated at 1019 buildings (Hyasat, 2015). According to Hyasat (2015, p. 603), out of 1019 heritage buildings, 657 were occupied, and 362 were unoccupied. According to Sekeran and Roger (2010, p. 295), a population size of 1100 observations requires at least a sample size of 285 observations. Therefore, a total of 657 heritage buildings were targeted in this study to achieve more representative and accuracy of study results. Six hundred fifty-seven questionnaires were distributed to the owners of heritage buildings through a small group of trained research assistants. Out of 657 questionnaires, 274 were returned in full, yielding a response rate of 41.7%.

Descriptive statistics, in terms of central tendency and dispersion techniques, was used to determine respondents' characteristics and describe changes in heritage buildings to ascertain the level of changes. Components of change, including external form, internal design, space, building materials, and extensions, were analysed descriptively. The study also used inferential statistics using multiple regression analysis to meet the research hypotheses.

4. RESULTS

Table 2 shows the respondents' characteristics; many cultural heritage buildings are owned by males and the majority of buildings are rented. The findings reveal that many occupants have a minimum level of education. In addition, the findings show that 81% of them aged between 30–50 years. Many occupants have a low level of income. These findings imply that there is considerable variance among respondents.

VARIABLES	PERCENT		
Gender	Male 87.3%	Female 12.7%	
Ratio of rented buildings	Rented 91.4%	Non-rented 8.6%	
Education level	Less undergraduate 69.4%	Undergraduate 30.6%	
Age	Less than 30 years 10.7%	40–50 years 44.5%	
	More than 50 years 9.3%	30–40 years 36.5%	
Level of income	Low 65.1 %	Medium 32.5%	High 2.4%

Table 2 Characteristics of respondents.

4.1 THE LEVEL OF CHANGES IN CULTURAL HERITAGE BUILDINGS

Table 3 presents the level of change in heritage buildings as a result of the urbanization process. The results illustrate that 54% of heritage buildings had experienced medium changes. This result suggests that 54% of the original value including uniqueness, components, space, and design of heritage buildings had changed. While the increase of changes is continued, the originality will be lost, unless the preservation of the original value using adequate materials that are compatible with the original materials and appropriate structural technologies. However, 7.7% of heritage buildings had undergone significant changes, with only 2.9% showing major changes, meaning these buildings had lost the overall original value. Findings show that 29.9% of heritage buildings had experienced minor changes, and 5.5% showed minor changes, emphasizing these buildings had an original value. The level of changes in heritage buildings oscillates between minor and medium levels, where 89.4% of surveyed buildings lie within these levels. Many of these changes have emerged in heritage buildings in the downtown of As-Salt City due to the growth of commercial activities and urban services.

Table 4 shows that the average space for investigated heritage buildings is 241.6 m². Most heritage buildings (66.1%) were taken place with three floors, reflecting people’s need for more space. Extensions to the original space ensure the desired level of space. Extensions could happen vertically or horizontally over different periods (Figures 2a and 2b). Findings reveal that vertical and horizontal extensions are dominant patterns of heritage buildings. Empirical findings show that the plot size and cost determine the extension trend. Findings reveal that 30.8% of heritage buildings had experienced extensions, 82.3% extended vertically and 17.7% extended horizontally, and 69.2% remained without extensions.

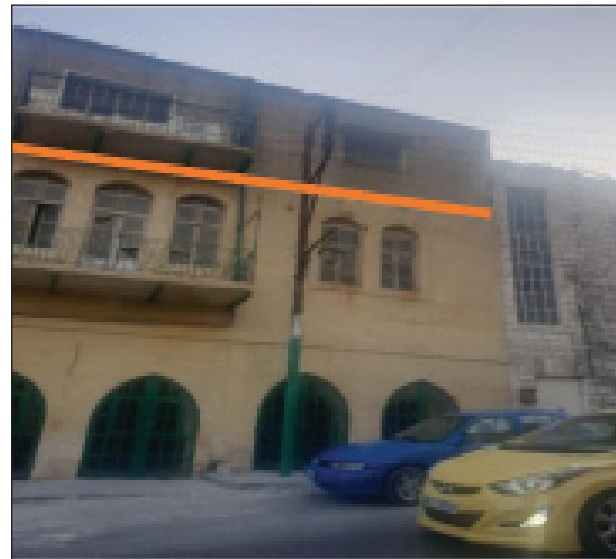


Figure 2a Extensions to original building. Source: Fieldwork.



Figure 2b Extensions to original building. Source: Fieldwork.

LEVEL OF CHANGE	VERY MINOR	MINOR	MEDIUM	MAJOR	VERY MAJOR	TOTAL
Count	15	82	148	21	08	274
Percent	5.5%	29.9%	54.0%	7.7%	2.9%	100%

Table 3 The level of changes in cultural heritage buildings.

CHANGES	ESTIMATIONS		
Space	Average: 266.0 m ²		
No. of Floors	One Floor 6.9%	Two Floors 27.0%	Three Floors 66.1%
Extensions	Yes 30.8%		No 69.2%
	Vertical 82.3%	Horizontal 17.7%	
Phases of extension	First 67.2%	Second 32.8%	
Time of extension	(1980–1999) 47% (2000–2020) 53%		

Table 4 Change in space.

Extensions to original heritage buildings happened at different time scales. According to Table 4, findings showed that extensions to the original space took place over two phases. The results show that 67.2 % of extensions were implemented within one phase and 32.8% within two phases. Most of the extensions to the original heritage buildings were represented by adding additional areas on the roof in order to utilize the ground and first floors (Figure 2). The results reveal that the size of activity is implemented over time, reflecting the high demand for space to satisfy residential and commercial needs. Empirical results show that 47% of extensions happened between 1980 and 1999, and 53% occurred from 2000 until the present. In addition, very few changes emerged in the external form by changing the colour of some parts, such as windows and doors (Figures 3a and 3b).

Table 5 shows that 46.4% of surveyed buildings had experienced interior changes. Interior division, tiles, doors, stairs, paint, and rehabilitation of utilities represent these changes. The process of interior change is greatly influenced by the number of occupants and the cost of implementation. Table 5 shows that changes in external form are limited, where 16.4% of heritage buildings had undergone external changes, and the level of change oscillated between medium and minor. Findings reveal that 37.2% of heritage buildings had used new types of building material for maintenance and updating, mainly interior design. No changes happened in some building materials such as yellow stone and external architectural elements. Except for some buildings that were repaired by JICA and the Municipality of Greater As-Salt, many owners of heritage buildings have used incompatible materials with the existing fabric. Almost, the physical properties of alternative materials were not evaluated by experts of heritage buildings, where the potential durability of the repair material and its future maintenance remain unsustainable.

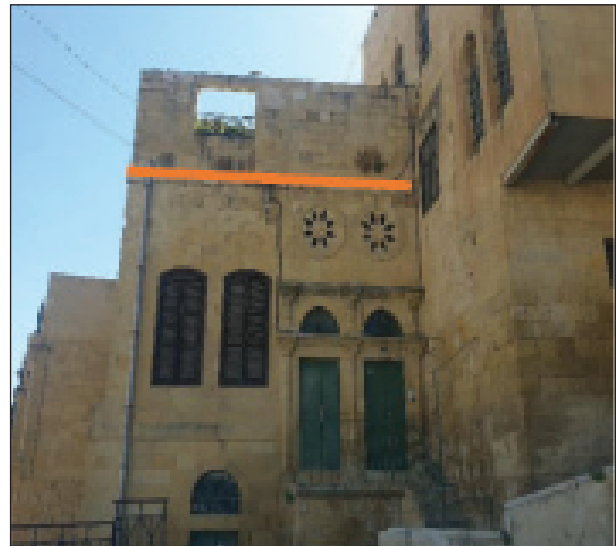


Figure 3a Additions to original area and change the external colour. Source: Fieldwork.

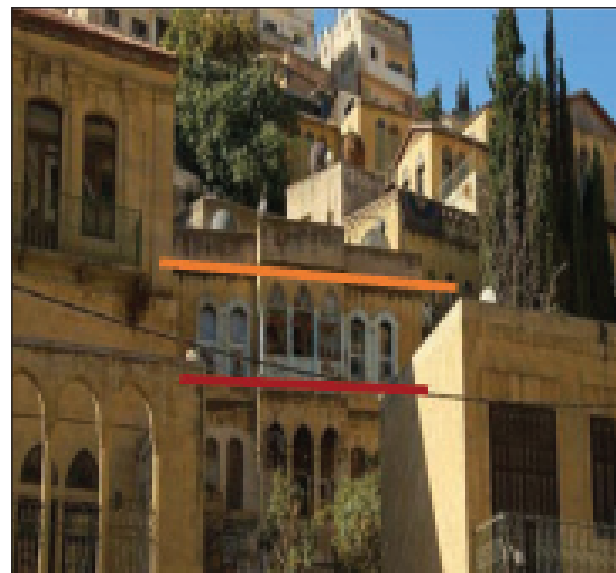


Figure 3b Additions to original area and change the external colour. Source: Fieldwork.

INTERIOR DESIGN					
Yes 46.4%			No 53.6%		
VERY MAINOR	MINOR	MEDIUM	MAJOR	VERY MAJOR	
2.2%	27.4%	35.3%	29.1%	6.0%	
EXTERNAL FORM					
Yes 16.4%			No 83.6%		
VERY MAINOR	MINOR	MEDIUM	MAJOR	VERY MAJOR	
3.4%	47.2%	42.3%	6.1%	1.1%	
BUILDINGS MATERIAL					
Yes 37.6%			No 62.4%		
VERY MAINOR	MINOR	MEDIUM	MAJOR	VERY MAJOR	
6.0%	21.1%	44.2%	23.3%	5.4%	

Table 5 Change to Design, Form and Materials.

4.2 TESTING HYPOTHESES

Table 6 shows the descriptive statistics for the study variables relating to the research hypotheses. The table includes the mean as a measure of central tendency, standard deviation as a measure of the spread of the distribution, minimum and maximum values, and skewness and kurtosis values to check for the normality of each variable. Table 5 shows that skewness and kurtosis values for all variables fall within the acceptable range.

Table 7 shows multiple regression analysis. The value of multiple R for this model is 0.563, which indicates that the model clarifies the observed values of the outcome variable. The results show that R^2 is 0.317, which means that the three variables included as predictors in the model account for 31.7% of the variation in the dependent variable. The adjusted R^2 (0.331) is ideally close to the value R^2 . It can be noted from Table 6 that F-ratio is 37.478, which is significant ($P < 0.05$). Table 6 shows that the Variance Inflation Factor (VIF) values have not outstepped the accepted maximum level of 10, and the tolerance values have stayed within the maximum level of 0.2. The multicollinearity problem does not exist. Therefore, the model is fit statistically.

According to Table 7, the statistics relating to research hypothesis 1 reveal that the number of occupants has a significant impact on changes in heritage buildings with a beta of 0.194 (t-value = 3.461). Thus, the findings of the regression model indicate that research hypothesis 1, which predicts a direct relationship between family size and changes in heritage buildings, is supported at the 0.05 significance level. Therefore, the hypothesis is fully accepted.

As shown in Table 7, the statistics relating to hypothesis 2 reveal that rental revenues have a significant effect on changes in heritage buildings with a beta of 0.205 (t-value = 3.555). Thus, the findings of the regression model indicate that hypotheses 2, which predicts a positive direct relationship between rental revenues and changes in heritage buildings, is supported at the 0.05 significance level. Therefore, the hypothesis is fully accepted.

5. DISCUSSION

This study sought to understand changes in cultural heritage buildings over time due to rapid urbanization. The findings show that changes in cultural heritage buildings occurred at a medium level. Studies from other countries have been showed that urbanization has an impact on heritage buildings. Kiruthigan and Thirumaran (2019) found that urbanization affects cultural heritage buildings in Kumbakonam, India, with a high level of changes; these changes included building materials, building form, building height, and building function. Similarly, Zhang et al. (2018) found that urban growth affects architectural heritage: in Buddhist Monasteries in the Qinghai-Tibet Plateau, China, at a high unexpected rate.

We found that renters support changes at a greater rate than original owners of heritage buildings, and there is evidence that renters for commercial purposes achieve revenues more than owners. From a residential perspective, the proportion of foreign workers (non-Jordanian) who live in these buildings is high, as heritage buildings are located downtown (Alnsour, 2011). A study

RESEARCH VARIABLES	MEAN	STD. DEV	MIN	MAX	SKEWNESS	KURTOSIS
Changes to heritage buildings	3.27	0.799	1	5	0.314	-0.581
Number of occupants	4.5	1.229	2	7	0.205	0.740
Services	3.75	0.881	1	5	0.647	-0.857
Rental revenue	2017.15	788.30	1150	4000	0.734	0.906

Table 6 Descriptive Statistics (N = 274).

INDEPENDENT VARIABLES	UNSTANDARDIZED COEFFICIENTS		STANDARDIZED COEFFICIENTS	t-VALUE	SIG.	TOLERANCE	VIF
	B	STD. ERROR	BETA				
Constant Changes	0.495	0.179	-	2.765	0.002	-	-
No. of Occupants	0.045	0.013	0.194	3.461	0.000	0.768	1.301
Rental Revenue	0.128	0.036	0.205	3.555	0.000	0.396	2.524
R = 0.563	R ² = 0.317	Adjusted R ² = 0.311		F = 37.478		Sig. 0.000	

Table 7 Multiple Regression Analysis.

Level of significant is 0.05 or less.

of cultural heritage buildings in Cyprus recommends that heritage buildings may achieve higher revenues than revenues from using heritage buildings in residential and commercial activities (Agapioua et al., 2015). Furthermore, most authors discuss heritage buildings as places of training and education (Kristl et al., 2020). Thus, these social influences have made the level of changes in cultural buildings a medium.

The results reveal that the number of occupants significantly impacts the change in heritage buildings. This result shows a high consistency between urbanization and changes in heritage buildings over time. The population leads to increased changes in heritage sites (Udeaja et al., 2020). Empirical findings by Kiruthigan and Thirumaran (2019) confirm that increased occupants have contributed to continuing and extending changes in built heritage. (Al-Houdalieh and Sauders, 2009) found a relationship between population growth and changes in cultural heritage in Palestine. The literature on population growth and cultural heritage supports that an increase in things obtained from Agapioua et al. (2015) confirmed these results. The increase in population number leads to increased demand for space, leading to changes in cultural heritage sites in Cyprus. On the other hand, findings show that the number of occupants positively impacts changes in heritage buildings, implying that the observed changes in heritage buildings remarkably accompany the number of occupants. The occupancy type, whether owned or rented, sets positive pressure on the level of change in heritage buildings. Based on the earlier results and argument, it can be concluded that an increase in the number of occupants has increased the level of changes in heritage buildings within the study area.

The findings show that rental revenue significantly impacts changes in heritage buildings. Kiruthigan and Thirumaran (2019) and Agapioua et al. (2015) found empirically that commercial activities lead to changes in the built heritage. Regression analysis results show that rental revenue has the highest impact on the level of changes in heritage buildings, with a beta of (0.205). Due to the commercial advantage of heritage buildings' location, the demand for location often increases over time. Traders tend to have the ground and first floors directly on commercial streets. Other floors of buildings are tenanted by low-income people, such as foreign employment and low-income families since the location of these buildings is not desired by medium and high incomes people to live. Empirical results showed that rental is an effective way to access heritage buildings, with 91.4% renting buildings. The average rental revenue from heritage buildings is 2017.15 Jordanian Dinars (i.e., 2849.05 USA Dollars) per annum. As a result, rental revenue contributed highly to changes in heritage buildings.

It is clear that factors contributing to change in heritage buildings in terms of the number of occupants and rental revenue are facilitated by urbanization, meaning heritage buildings provide benefits for residents. Thus urbanization will continue to increase changes in heritage buildings. In this context, adherence of urban institutions to conservation principles will only sometimes lead to a reasonable solution from peoples' perspective. Considering residents' socioeconomic conditions, logical solutions are needed to arrange conservation norms and priorities. The practical solutions should reduce the current changes in heritage buildings by providing economic opportunities for residents. Solutions that highly operate towards achieving the above objectives can be effective instruments to overcome changes in heritage buildings.

Previous studies have yet to be developed on the relationship between urbanization and changes in cultural heritage, particularly in the Middle East region. Our study fills this gap. In addition to the driving factors of this phenomenon listed in the questionnaire, we also obtained several photos and comments which called for conserving cultural heritage in As-Salt and maximizing its socioeconomic benefits. The Venice fifth clause of the agreement provides guidelines for protecting built heritage, which the government and the local community should consider. Additionally, there is a need to motivate young people to invest in these heritage buildings instead of renting them for residency. The rentals of non-Jordanians should also be banned to conserve the tangible and non-tangible heritage of As-Salt. Investing in these buildings can create new job opportunities, and the region's socioeconomic development can be stimulated. Preserving As-Salt's cultural heritage will preserve the city's cultural identity and contribute to the region's overall development.

This study has several limitations. First, data were gathered only from one case study, which could restrict the results' generalizability to other cities. Second, this study is cross-sectional research due to time, effort, and cost considerations. Third, this study is conducted using only a quantitative method which provides restricted understanding.

Despite these limitations, we report for the first time on the changes in cultural heritage buildings in Jordan to conserve the heritage environment, improve urban planning practices, and introduce empirical findings for policymakers in the Middle East region.

6. CONCLUSION AND RECOMMENDATIONS

The findings reveal that urbanization has led to changes in heritage buildings at a medium level. The number

of occupants and rental revenues had a significant impact on the changes that occur in heritage buildings over time. The buildings with many occupants show a high change rate, and the buildings with high revenues from both commercial and residential uses show a high change rate. These changes are aggravated by increasing people's needs for business opportunities and the demand for housing by low-income people. The findings of this paper provides important insights to urban authorities' decision-makers and urban planners, which facilitate the development of urban heritage measures and interventions. In this context, various measures were used to assess the current status of heritage buildings at different levels, which could be categorized into two areas: physical conservation interventions that improve the structural and architectural quality of the building, and adaptive reuse interventions that improve the internal and external design of the building to be ready for use.

Urbanization in Jordan is rapid. Thus, physical elements such as extensions to the original space and changes in interior design should be taken into account by urban institutions. Changes in cultural heritage buildings should be linked to a comprehensive urban policy. Policymakers should see these changes from the development perspective in order to shift these changes into timely opportunities for ensuring the preservation of heritage identity. Therefore, it is necessary to empower heritage building owners by re-employing and using them for cultural events and raising awareness of cultural heritage in the city.

It has been shown that many changes are implemented without considering international technical standards. It should be observed that population needs are increasing, thus current built heritage might be subjected to more changes in the future. Therefore, considering global standards would contribute to the cultural, economic, social, and functional sustainability of the built heritage. Although changes in heritage buildings have some social-economic gains, may at the same time cause a lost in the original value of heritage buildings. The benefits of cultural heritage buildings have been widely researched. Still, more research needs to be conducted on the relationship between urbanization and changes in cultural heritage buildings over time, and this study meets this research gap. This study is conducted in the Jordanian context; it would be interesting for future research to consider other countries in the Middle East since comparative research can contribute to improving knowledge and enhancing urban policies to manage cultural heritage efficiently. Therefore, extending this study to other cities in Jordan is an important area for future research. Examination of other cities will provide larger data and more insights into the relationship

between urbanization and changes in heritage buildings. Establishing a better understanding of the relationship between urbanization and changes in heritage buildings requires longitudinal studies in future research. In addition, future studies should consider using qualitative methods to explain better the relationship between urbanization and changes in heritage buildings.

The findings of this study shed light on the multifaceted interaction between urbanization and heritage buildings in As-Salt, Jordan, offering valued insights while also presenting certain limitations. The remark that urbanization has led to medium-level changes in heritage buildings emphasizes the developing landscape of cultural heritage in the face of rapid urban development. Mainly noteworthy is the important impact of the number of inhabitants and rental revenues on these changes, revealing that buildings with advanced occupancy rates and greater revenue generation experience more alterations. This highlights the union of economic factors and urbanization dynamics. Though, a main limitation lies in the lack of the socio-cultural dimensions of these changes, which could have augmented the study's perspective.

Additionally, the study highlights the need for complete urban policies that consider the preservation of heritage individuality amid rapid urbanization. It calls for urban authorities and officials to view these changes not only as challenges but also as opportunities for the adaptive reuse of heritage buildings. Though, a limitation emerges in the form of the study's focus on the Jordanian context, which may limit the generalizability of its findings to other Middle Eastern countries. A comparative approach involving multiple cities across the region could deliver a broader understanding of how urbanization impacts heritage preservation.

COMPETING INTERESTS

The authors have no competing interests to declare.

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