

Towards Sustainable Development in Historic City Centres: An Integrated Approach

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Abstract

Few investigations have examined the sustainability of urban development in historic centres in view of disaster vulnerability. The objective of this paper is to shed light on the importance of integrating disaster preparedness for historic city centres to the sustainable development of such areas. The paper points out that sustainable development in historic areas requires disaster planning, and that historic preservation is by nature an act of Preparedness. The investigation finds that historic city centres have many vulnerabilities, which could be reduced through sustainable development actions. The paper utilizes a case study approach investigating the historic core of the city of Karak, Jordan. Field work, interviews, and documents are analyzed to distinguish the current status-quo. The investigation points out to the poor development of the historic centre. The paper suggests pointers on how historic preservation should be integrated with development and disaster planning. The results can be transferable to contexts where historic city centres face the challenges of natural disasters.

Keywords: *Sustainable Development, Historic Preservation, Disaster Management, historic city centres, Jordan*

1 Introduction

City centres have special development needs. Primarily inner cities are targeted for renewal or revitalization plans, especially historic areas. Luckily, the practice of large scale demolition for redevelopment is not as common as it used to be. Nonetheless, Jordanian cities have limited protection for their built heritage, which has led to the loss of many heritage buildings and areas (Daher, 2000). Problems in the historic core usually involve several facets, including but not limited to social, economic, and physical degradation.

Research on the disaster management of historic areas is scarce (Fielden 1994, Nelson 1991, Spennemann & Look 1998). Some investigations cover specifics like recovery (Al-Nammari & Lindell, 2009, Schwab et al. 1998), mitigation and disaster impacts (Blair-Tyler & Kristiansson 1999, Langenbach 2005, Look & Spennemann 2001). The importance of disaster planning has been cited (Wu & Lindell 2004) and recent investigations have also pointed to the challenges facing historic buildings in the aftermath of disaster (Al-Nammari, 2008; Al-Nammari & Lindell, 2009, Jigyasu 2000, Spennemann, & Look, 1998). Still, few investigations cover the vulnerabilities of historic areas or the need for preparedness, especially in the developing world.

Preparedness is a process connecting several activities targeting the reduction of disaster effects. Such activities include creating disaster recovery plans, training disaster responders, educating the public on disaster preparedness and response, conducting emergency response drills, in addition to many other activities (Tierney et al. 2001).

The objective of this paper is to investigate the challenges of sustainable development in a historic city centre in Jordan. The investigation brings attention to the historic core as a special zone with conditions that augment its vulnerability. The paper argues that sustainable development in historic areas should include disaster planning in addition to heritage preservation.

The paper uses a case study approach; utilizing fieldwork, interviews and documents to understand the status quo of the historic core. The paper investigates the general vulnerabilities of the historic core, and suggests an approach for integrating sustainable development and the historic preservation. Data sources for this paper were: 1) semi-structured interviews with officials in the Municipality of Karak. 2) Field work consisting of walkthroughs in the historic core to identify the current physical and social composition of the historic centre, in addition to an investigation of previous conservation attempts. And 3) documents from the Karak Municipality and Ministry of Tourism and Antiquities, describing previous, current projects, or future plans for the city centre. These sources were critically analyzed to understand the vulnerabilities of the area under study.

1.1 Sustainable Development and Disasters

Sustainability emerged as a concept linking environmental conservation and economic development in the 1970s, and soon was adapted into several UN conferences. An important definition for sustainability emerged with the Brundtland Report, as a “process to meet the needs of the present without compromising the ability of future generations to meet their own needs” (WCED, 1993).

Research has been able to identify many implications for this definition. On the social level, sustainability supports social equity and the just distribution of resources. On the environmental level, it calls for environmentally friendly strategies and minimal source consumption. On the cultural level, it calls for safeguarding cultural resources for future generations and reducing losses due to carelessness, damage, or disasters. (Giddings et al. 2002). As a concept, it delineates an ethical path, not an outcome. Sustainability is considered to have many facets.

On the other hand, the multi faceted nature of sustainability has led to attempts to simplify the notion, resulting in reductions. A review of the available literature shows two main reductions for the concept: 1) sustainability as ecologically friendly, adopted by many circles in the industrialized world, including architects and planners. This may be linked to the fact that the most challenging aspect of sustainability for industrialized nations is related to ecological challenges: the reduction of dependency on fossil fuel, reducing consumption of resources, and adopting ecologically friendly “green” policies. Another reduction is 2) sustainability as locally maintainable development. This reduction is adopted by circles working on development in the non-industrialized nations. This notion encapsulates the worries of the donors, who would like to see development continue beyond the involvement of the donor’s financial input.

Therefore, Sustainable Development revolves around four concepts: futurity (inter-generational equity), social justice (intra-generational equity), procedural equity (people treaded equally, local participation), geographical equity and biodiversity (Giddings et al. 2002, Hardy & Beeton 2001). It is the comprehensiveness of this notion that makes it vital for the success of development and planning efforts.



Figure 1 Deserted residential buildings dating to early 20th century

From a hazard recovery point of view, sustainable development is “achieving a pattern of human settlement that generally keeps people and property out of harms way” (Berke & Beatley 1997, 183). It is anticipated that the global cost of natural disasters will exceed \$300 billion annually by the year 2050 (United Nations International Strategy for Disaster Reduction (UNISDR) February 2003), which points to the challenge of our management of the built environment so far.

A 2003 UN report points to the widespread social, economic and environmental destruction caused by earthquakes in many countries. The report recommends that several actions be taken to improve disaster preparedness. The report focuses on development programs, suggesting advocacy for the integration of disaster risk reduction in national development plans utilizing comprehensive urban development strategies (UNISDR February 2003).

Disaster preparedness is an important aspect of sustainable development. Berke (1995) clarifies that sustainable development principles apply to natural hazard reduction, since the concept offers a unifying theme for problems of poverty, environmental destruction, and natural hazard risks. Furthermore, Berke & Beatley (1997) provide several suggestions for achieving sustainable development. Their chief recommendations are: identifying the role(s) of external donor organizations, promoting bottom-up disaster recovery, managing political hindrances, making disaster plans relevant, achieving fair and equitable recovery, encouraging local participation, and planning for sustainable mitigation.

Table 1: examples for possible earthquake impacts (Lindell & Prater, 2003; NCDEM, 1998)

| | |
|-----------------------|---|
| Physical impacts | Injuries and fatalities. Damage to public or private buildings. Damages to roads and infrastructure. Destruction of natural environment. Damage of furniture and equipment. |
| Economic impacts | Destruction of commercial buildings, direct impact through property or merchandise damage, loss of jobs, investors moving out, factories shutting down, loss of tax base, delays in business recovery. |
| Social impacts | Disruption and scattering of families, loss of provider(s), permanent loss of family members, uprooting and relocation, emergency aid disputes, lack of trust, antagonism and envy, housing shortages. Etc. |
| Psychological impacts | Mental and emotional stress. Loss of loved ones. Traumatic experiences. Delays in receiving help. Etc. |
| Cultural impacts | Damage to cultural property. Permanent loss of monuments and significant buildings. Damage to traditional urban fabric. Damage to the natural environment. Loss of museum and cultural collections. Changes in historic character. Etc. |
| Other impacts | Political impacts, international impacts. |

It is important to plan for disasters if development programs are to achieve success. Disaster impacts are varied (Table 1). Twigg (1998) points to the importance of disaster preparedness in developing countries; where a natural disaster can not only spoil long term development projects, but also increase the foreign debt of the country. The last earthquake in Haiti provides an important lesson for developing nations on disaster preparedness.

1.2 Sustainable Development and Historic Preservation

Sustainability in heritage management is not yet a fully developed concept. Among the early notions of sustainable heritage management was the concept of "Integrated heritage conservation"; which emphasized that historic centres should not be allowed to fall under the threat of neglect, demolition, excessive traffic or incompatible new construction; stressing that projects should avoid gentrification and promote public participation (The Council of Europe, 1993). Similarly, many international charters foster concepts of sustainable heritage management, sometimes without mentioning that specific term (cf. ICOMOS charters).

Pickard & de Thyse (2001) provide general principles that can guide sustainable endeavours in heritage management; among which are promoting policies that integrate sustainable development with heritage conservation, and improving the quality of life. As such, the preservation of historic areas can be a catalyst for redevelopment of historic areas; not just their preservation.

There is distinctiveness when working in a historic city centre. Beyond preserving buildings there is a quest for preserving the social and physical fabric that makes an area. The importance of integrating disaster management into historic preservation activities has been acknowledged by the Washington Charter (ICOMOS 1987); it affirms that such areas should be protected against natural disasters not only to safeguard the built heritage, but also to maintain the security and well-being of its residents.

In response to the threats of disaster, the Blue Shield movement was launched to promote that “the values of cultural heritage are taken into account when planning development; and to provide risk prevention and mitigation to the practice of conservation” (Jokilehto 2000). Such an approach is important as it points to the strong relationship between sustainable development, disaster preparedness, and heritage conservation. However, this paper points to the importance of integrating the three approaches, as success in any individual aspect separately would be limited.

1.3 Disaster Preparedness and Historic Preservation

Disaster preparedness is a concept that incorporates many actions intended to reduce disasters impacts (Table 1) on a community. Such actions can be divided into emergency preparedness actions and recovery preparedness actions (Lindell & Al-Nammari 2006). Preparedness actions include comprehensive planning, mitigation planning, emergency response planning, and recovery planning. This paper is not intended to provide details on any of these plans, but to argue for the importance of developing plans for historic centres that integrate preparedness, development, and historic preservation. Such plans aim at guiding a variety of groups, such as owners of historic properties, local governments, and disaster assessment and relief personnel (Minnesota Historical Society 1998).

While acts of preservation can help in the disaster preparedness of a community, Historic Preservation is still detached from disaster planning. Further, disaster preparedness has focused on museums, libraries, and collections; while ignoring historic city centres in spite of the many indicators that such areas face disaster threats (Al-Nammari, 2008, Al-Nammari & Lindell, 2009, Jigyasu 2000).

Al-Nammari and Lindell (2009) identified buildings that face challenges during disaster recovery and need to be addressed by preparedness activities. Buildings such as cultural centres, downtown apartments, and multi-use buildings have been shown to face time and cost issues. Furthermore, evidence indicates that prior planning can facilitate disaster recovery (Al-Nammari, 2008, Wu & Lindell 2004).

High vulnerability is noteworthy for developing countries, attested by the large number of casualties in such events. According to Blaikie et al. (2003) vulnerability is a result of a pressure model; within which, vulnerability results from root causes (i.e. such as unfair economic structure and social inequity), dynamic pressures (i.e. rapid population growth and poverty), and unsafe

conditions. This model particularly helps in explaining the destructive effects of disasters in the developing world, and the large variation in disaster human loss between industrial nations and developing nations.

A similar model for explaining vulnerability is presented by Blaikie et al. (2003) and it focuses on access to resources. These two models identify vulnerability as the capacity of a certain group to “anticipate, cope with, resist, and recover” from a disaster impact (Blaikie et al. 2003, 9). On the other hand, Alexander (1993) identifies vulnerability based on the definition provided by the United Nations Disaster Relief Coordinator (UNDRO) as “the degree of loss to a given element or set of elements at risk resulting from the occurrence of a natural phenomenon of a given magnitude” (Alexander 1993,7). Under this definition, vulnerability is closely related to the hazard itself and how people prepare for it. People’s perceptions, mitigation measures, or risk amplification measures are responsible for the total vulnerability of a community (Alexander 1993). This paper integrates the two models to understand the vulnerability of the city centre, since it helps in understanding the conditions in an average city of a developing country. Noteworthy, an in-depth analysis of the vulnerability of the historic centre is beyond the objectives of this paper.

Lindell & Al-Nammari (2006) recommend the following in planning for disasters: 1) Identify disaster recovery stakeholders and establish a community Recovery Planning Committee. 2) Inventory local historic structures and assess the effects the community’s principal hazards will have on them. 3) Establish support for historic preservation before disaster strikes. 4) Develop a community Recovery Operations Plan. And 5) Provide technical assistance and preservation incentives to owners of historic buildings.

In the past two decades, increased attention has been given to the issue of the protection of cultural property in seismic areas. Preservationists came to acknowledge that part of the effort aimed at preserving historic buildings should address seismic retrofit (Fielden 1994). Available research (Al-Nammari, 2008, Al-Nammari 2005, Lindell & Al-Nammari 2006, Spennemann & Look 1998) has shown that lack of preparedness can have serious effects not only on the community in general, but on cultural resources as well. Lack of disaster planning can lead to permanent loss of historic buildings, radical change to the historic urban spaces, loss of community support for preservation, and delays in development and reconstruction activities (Lindell and Al-Nammari, 2006).

2 Karak City Centre

Karak is a city in the southern part of Jordan and is also the centre of a governorate of the same name. The city is one of the oldest in the region, but it’s not one of the largest in the country. Thus it is chosen as it represents the challenges facing an average historic city in a developing country.

This paper investigates the historic city centre in particular. This historic core lies on a somewhat flat ridge overlooking the Jordan Valley, and is surrounded

by steep slopes exceeding 70% in many areas. The historic city centre is about 500 meter square, and lies on a ridge elevated 960 meters above sea level. The walls are surrounded by steep slopes on three sides, which restricted the horizontal growth of the city. Most modern expansion took place on the south end outside the castle walls, but this study focuses on the historic inner core of the city.

2.1 Vulnerabilities

2.1.1 Physical Vulnerability

Studies have shown that Jordan is prone to earthquakes and that planning and policy making should take that into account. Further, damaging earthquakes (magnitude (M) >5.00) have occurred in the region within the past 100 years, especially along the Jordan rift. The rift valley is a major shear zone due to constant left –lateral movement between the faster moving Arabia (including Jordan), and the Sinai/ Palestine plate to the west (El-Isa 1985, Jimnez et al. 2006).

The several active faults around Karak caused several earthquakes throughout history, which destroyed parts of the city and castle. Data collected so far has shown that earthquakes of different magnitudes have occurred in Karak in the past 200 years (El-Isa 1985). Previous earthquakes make buildings more vulnerable as they shake the construction and might weaken joints or create cracks (Fielden, 1994).

Interviews with the Municipality officers revealed that the city has no disaster plans for earthquakes, nor do they anticipate such plans. Noteworthy, many of the buildings within the city are of traditional construction: stone-masonry structures that are not retrofitted for earthquakes.

Earthquake effects can be varied. However, no investigation of the seismic characteristics of the buildings in Karak has taken place so far. There is a need for an investigation of the seismic strength of the traditional buildings of the area.

Karak city centre has several stages of building, which can be roughly grouped in to five main groups:

1- Buildings before 1850s, which include all structures of the Karak Castle, the walls, and their corner towers, some basements dating to the pre-ottoman date, in addition to some other archaeological remains. The castle is of hewn stone masonry without any kind of reinforcement. It is mainly a tourism destination, and is not inhabited except for a museum occupying some of its halls. The castle already suffers heavy damage due to historic earthquakes and not all of its parts have been restored.

2- Buildings from the period 1850s-1921 (modern age before the Hashemite rule). This period produced several public buildings, schools, churches, mosques, shops, and residences. Buildings of this period were of traditional construction

(ie. un-reinforced stone masonry). Some of these buildings show cracks due to earthquakes. Many of the buildings in this group are inhabited; some were restored, and others are abandoned.

3- Buildings in the period 1921- 1948. This period starts with the establishment of the new Hashemite rule. It witnessed colonial effects and many developments in the national policy and legal structure. Buildings in this period are similar to the previous phase but, portray minor changes in the use of materials and finishes. Generally, this period witnessed the introduction of grid urban planning, the use of cement, and the use of I- beams.

4- Buildings from the period 1948-2001, which not only witnessed the political change from TransJordan to the Hashemite Kingdome of Jordan, but also witnessed two major waves of refugees from Palestine. This led to increasing the construction activity in many Jordanian cities, including Karak, which witnessed minor demographic change compared to other Jordanian cities. During this period, building codes were introduced, engineered buildings appeared, and new streets were opened. Assuming good workmanship and detailing, the existence of steel and concrete might help in reducing earthquake damage; yet that should be based on proper structural investigation of existing structures.

5- Buildings after 2001, which is the year that witnessed the introduction of the Seismic Building Code (Jordan National Building Codes 2001) as a mandatory code for all new structures. The enforcement of the code, as with other codes, is the responsibility of the local Municipality. However, the employees pointed out that there may be divergences between blueprints and actual construction, citing difficulties in the enforcement of all codes.

Although quite elementary, the phases provide generic categories depicting construction methods. The susceptibility of the structures to damage is largely dependent on the construction method, level of craftsmanship, and degree of maintenance, in addition to soil conditions and earthquake characteristics. There are no studies in Jordan to investigate the vulnerability of heritage buildings of the last 300 years in spite of investigations of some major archaeological remains. The current seismic code targets buildings conforming to building construction codes, however, a large bulk of buildings were built prior to any codes.

As for the infrastructure, the researcher could not find any assessment for the infrastructure's seismic capacities, and the local municipality officers were not aware of any study to cover that issue. This is important as the assessment of infrastructure will allow for an evaluation of the criticality of the post-earthquake situation and local needs; especially since the historic core is semi-isolated on the ridge.

2.1.2 Institutional Vulnerability

On the institutional level, the city has limited planning capacity and depends on the central government for development planning. The planning department has

no trained planners, but architects with on-the-job planning experience. Land use, zoning, and new infrastructure plans are mostly prepared as a consequence of on-situ construction activities. Furthermore, the city has limited GIS planning capacity; mostly depending on the central government. Discussions with some Municipality personnel revealed that the Municipality has several human, administrative, legislative, and technical limitations.

In the same way, the local emergency department has no training targeting earthquake response in particular. They have substantial experience in responding to weather related emergencies (i.e. flash floods and snow storms). They have responded to minor earthquake damages in the last decade but no specific training took place for earthquake preparedness locally. Therefore, the City conducted a sheltering study in 2005 based on requirements from the central government, and determined the sheltering needs in local schools in case of an earthquake. Also, based on guidance from the central government, the Municipality established a new emergency response centre (fire station) in the historic core; since it had none. On the other hand, the interviews revealed that the City has no investigations of possible earthquake damages or emergency scenarios.

On the national level, several steps have been taken towards national risk reduction (cf. United Nations World Conference on Disaster Reduction 2005). Interestingly, no plans exist on local government levels, which makes local governments dependant on the central government. Disaster planning is not being adopted on all institutional levels, and mitigation activities, which should provide for structural and non-structural aspects, have not been addressed by planners, architects, or engineers except for a limited seismic code. Most preparedness activities take place within emergency organizations.

2.1.3 Socio-economic Vulnerability

On the socio-economic level, the city centre has special challenges. Most of the original inhabitants have moved out to the new suburbs or to the capital city; whereas a great bulk of the older houses are deserted, inhabited by less advantaged local families who can not afford better accommodations, or inhabited by foreign workers. Many of the derelict houses that the author visited were inhabited by single expatriate male workers, which increases the vulnerability of the area.

The population density in the city is 61.3 (Municipality of Greater Karak 2007), but there are no statistics for the historic centre specifically. However, the municipality officers maintained that the historic centre is of higher density, and mostly accommodating mixed use (commercial and low-cost residential). The historic centre is considered the Central Business District for the city.

The information needed for assessing the social vulnerability of the historic centre itself is very limited. According to available statistics (Department of Statistics n.d; Municipality of Greater Karak 2007), Al-Karak has high unemployment rate (22%, compared to 12% nationally), explaining a migration towards the capital city in search of better opportunities. The average size of the

family in Karak is about 6.5, compared to 6.1 nationally. The large family size should be considered in addition to the high percentage of people under 15 years of age, which indicates an economic burden on families. Furthermore, the Average Annual Current Income of Households (in Jordanian Dinars) is 877.3 compared to 900.5 nationally. There are few private sector investments, and the majority of the workforce is employed in the public sector. However, the city is characterized by strong familial relationships that are based on tribal loyalties, which provide support and assistance for those in need. Such strong bonds are very helpful in times of disaster.

An important consideration is that the historic centre is the Central Business District of the city. Should a damaging earthquake happen, the economic impact would be vast as most businesses would be influenced. Delays in the business comeback can negatively impact the local economy and household recovery (Lindell & Prater 2003). One can anticipate such delays, since research has shown that derelict historic buildings are more vulnerable to post-disaster demolitions (Blair-Tyler & Kristiansson 1999), and that historic buildings which face preservation challenges before disaster will probably face complications, delays, and demolitions post-disaster (Al-Nammari, 2008). This situation will be critical in a context like Karak, where pre-disaster protection for heritage buildings is minimal.

2.1.4 Built Heritage Vulnerability

Few of the original neighbourhoods still exist. The original fabric of several areas is still present, but many buildings have been adjusted to commercial use, mostly through improper rehabilitation work. Furthermore, many buildings in the centre are deserted and face demolition threats, and many of the historic alleys are derelict. The city is awaiting plans for the conservation of its historic centre to be prepared by the central government; such plans are funded through foreign aid for heritage tourism development. Several conservation projects took place in the city, targeting specific buildings, or groups of buildings. Still, the larger bulk of heritage buildings are not properly managed or conserved. The cultural resources in the city are at risk due to uncontrolled change. Also, the priority given to the castle and related archaeological sites has led to an apathetic attitude towards buildings of the last 300 years. Even when some municipality officers recognized the importance of heritage buildings, they focused on individual buildings of aesthetic value only. The urban fabric and buildings of social or cultural value are not of concern.

The Jordan National Tourism Strategy (Jordan Ministry of Tourism and Antiquities 2004) identifies tourism as the major source of income nationally. Interestingly, the Tourism Strategy mentions sustainability a few times but does not adopt sustainable approaches. The Strategy presents sustainability as economic continuity. It focuses on economic gain and marketing, and ignores the local's economic challenges, social issues, and cultural factors. Furthermore, the strategy does not tackle disaster preparedness; although it is a recommended approach by international charters (ICOMOS 1987).

Additionally, none of these development projects target earthquake vulnerability, or any other disaster risk. The physical, cultural, socio-economic, and administrative vulnerability can be greatly reduced should such projects adhere to sustainable development principles. In general, sustainable development has been hailed in such projects only to prove to be a cliché without implications (Daher 2000).

The historic centre of Karak is currently undergoing planning for tourism development. The proposed projects target visitor routes, legislation for protection of the historic character, and the adaptive reuse of select buildings.

3 Towards A Sustainable Management of the Historic Centre

As explained above, sustainability is a path that requires integrating Historic Preservation and Development towards the reduction of local vulnerabilities. This would not only help preserve the historic area, but also would improve the quality of life in that area. The following can be proposed as principal steps towards that end:

3.1 Adopting a Comprehensive Integrated Sustainable Approach.

It is important that development planning, heritage management, and disaster reduction be integrated within a comprehensive approach to the management of historic centres. Development projects in Jordanian historic centres lack attention to the deficiency of current Preservation practices in targeting socio-economic development or environment degradation (Al-Nammari 2003, Daher 2000). There is a need for a radical change in the current approach for heritage management to incorporate community development and the interests of locals.

Also, the multidisciplinary nature of the planning and implementation process is to be acknowledged. Historic centres have distinctive socio-economic and physical characteristics, in addition to their special meaning as heritage. So far, preservation in Jordan has not addressed heritage as such, but as a national economic resource.

Within a comprehensive approach, planning for a historic building's preservation incorporates understanding each building's history, the sequence of construction, previous repairs, former restorations, significance, in addition to former earthquake damage and seismic strengthening needs (Look et al. 1997).

Surveys of heritage resources are important, and they are lacking in Jordan. But an integrated approach means that such surveys are created not only to aid preservation activities, but also to support development programs and disaster preparedness programs. Such a step can help in reducing demolitions during the recovery stage. Nelson (1991) has several recommendations on what a minimal survey should contain, such as a short description of the property, and data that

can be used statistically (ex. construction materials, previous damages, state of maintenance).

3.2 Organizing a Pro-Preservation Environment

As mentioned above, it is important to develop heritage management tools prior to disaster. Heritage preservation should be well founded before the disaster onset. The sustainable management for historic areas starts before disasters, and involves all stakeholders and locals.

Several inquiries have tackled the challenges facing heritage management in Jordan. Mainly, there is a lack of a legislative and organizational structure for managing heritage. Heritage is addressed under the umbrella of tourism, thus leading to a focus on tourism marketing and tourist services. Heritage resources are not yet identified; there is a focus on archaeological site preservation and neglect to recent heritage resources of city centres, cultural landscapes, vernacular heritage, industrial heritage, and heritage routs. Creating the legal context that organizes preservation and initiating local surveys to identify different types of heritage are two priorities for organizing heritage management in Jordan (Al-Nammari, 2008; Daher 2000).

In addition, it is important to create the needed legislative and educational infrastructure to facilitate public awareness and encourage public participation. It is important to change the current attitude, in which preservation is the preoccupation of public agencies or tourism business investors, into an integrated process that includes the owners of such buildings and the general public.

3.3 Disaster Preparedness for sustainable Historic City Centres

Since earthquakes can not be forecasted, an important tool for preparedness is Disaster Mitigation. The objective of which is to reduce loss in life and property upon earthquake onset. Mitigation actions can take place before, during, and after a disaster, and overlap other phases of emergency management. There are two main types of mitigation: structural mitigation, which includes structural intervention to reduce disaster effects such as the seismic retrofitting of existing structures. And non-structural mitigation, such as public education, training, development of land use plans, and zoning ordinances (North Carolina Division of Emergency Management (NCDEM) 1998).

An important mitigation effort will start by developing a risk plan and identifying historic property at risk. According to Nelson (1991), this section should contain two parts: first there is a study of historical records of the earthquake damage to understand how it influenced the historic buildings. Then there is a technical examination of the structures and their characteristics. It is important to connect this structural assessment to development efforts. The survey should be developed based on an integrated approach to aid preservation, development, and disaster preparedness (Look et al. 1997; Al-Nammari, 2008).

Assessing the physical vulnerability of the city centre and its inhabitants is important. The general vulnerability analysis is a multi disciplinary task that can also aid development efforts. Socio-economic studies should also be incorporated. At a minimum, this phase should contain an assessment of the number of lives and the value of property in those areas identified as being at risk. It should also address critical facilities such as fire stations, hospitals, or chemical storage facilities, some of which may be historic (NCDEM 1998; Al-Nammari and Lindell, 2009).

It is important to determine the potential damage to buildings. The objective is to find the areas that will be highly disturbed. The question that needs to be answered is: what are the most vulnerable areas or buildings, and what are the areas/buildings that are less vulnerable. This will help identify the priorities for development, and thus, preservation efforts. Research directs local governments to address certain functions as a priority for disaster preparedness, such as housing, infrastructure, emergency, and health care facilities (Al-Nammari & Lindell, 2009). As such, disaster preparedness and development work both towards the same end.

4 Conclusion

This paper investigated a historic city centre in order to highlight the challenges facing the sustainable development of such an area of heritage significance. The paper focused on disaster preparedness as an important aspect of sustainable development. Sustainability provides an umbrella for the integration of three targets: historic preservation, disaster preparedness, and development. This inquiry presented an argument for an integrated approach for the management of historic city centres. Historic centres must be addressed in innovative ways that adopt Sustainability as a guide.

The paper presented several recommendations on how such a sustainable approach can be achieved. The paper proposed several steps for improving the sustainability of heritage conservation in city centres vis-a-vis earthquake preparedness, and points to the very close affiliation between development and disaster vulnerability on the one side, and development and heritage preservation on the other.

Finally, this paper identified historic cores in Jordan as an area in need for specific conservation programming that takes into account the vulnerabilities of the community. Future research needs to tackle the different types of vulnerabilities in different cultural contexts, and practical ways of achieving such an integrated approach. The research process revealed a severe lack of information that is needed for planning such projects. It also indicated that there is a need for commitment and policy change on national and local levels.

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