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Urban and Architectural Development in Amman Downtown

(Case Study: between Natural Disasters and Great Heritage Lose)

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ABSTRACT: The center of Amman (Downtown) is one of the most marvelous sites in Jordan as it represents a wide range of heritage through time and space. However, the Downtown suffers from severe disorders in terms of negative urban development due to the cross cutting cultures between the past and present. Despite of its historical and cultural richness, several factors affected the architectural uniformity of the area. The successive cultural effect is clearly marked in the downtown of Amman. Political factors, such as the arrival of the Iraqi and Syrian refugees, significantly controlled the urban planning development in a heterogeneous way created poor and overcrowded areas of immigrants due to many residential abusive areas. Moreover, the lack of innovation and maintenance of the entire downtown area with no changes through time in addition to the lack of awareness made the downtown unable to response to various emergencies. Natural hazards threats for examples earthquakes and floods are considered as a big challenge influencing the urban, economic and cultural development process, particularly due its location in a valley surrounded by seven hills. The current study focuses on finding solutions to overcome the mufti-folds of risk surrounding the area. Recommendations are put forwards for decision makers to maintain the Amman Downtown form further degradation.

Keywords: *Development; Infrastructure; Natural Hazards; Traffic Pollution; Amman; Jordan.*

INTRODUCTION

The urban planning and architectural designs are interrelated and often integrated, emphasizing positive urban environment for human life, comfort, production and creativity. The integration of urban planning and architectural processes plays an active role in all activities such as road networks, residential areas, parks, social and service centers and other elements and components of the city. Urban Planning and Design is a science that is associated with other applied, social, economic and psychological sciences. Combination of architecture and planning principles will regulate the urban environment in accordance with the needs of urban society through conscious design (Cliff & Peter, 2005; Elkin et al., 1991).

Urban activity must contain in addition to the component of artistic creativity responding to the present and future needs, the basic requirements of its habitants. Cities developments must consider the social, economic and cultural mobility, and above all the natural hazards in a region, in order to meet the contingencies and emergency cases such as citizen's overflow, wars and political instabilities. Good planning is an aid to avoid or minimize the various obstacles may affect the development, for example London or Paris, as they suffered many wars, yet have been able to withstand through time (Cliff & Peter, 2005; Elkin et al., 1991; Lynch, 1960).

Amman is the capital of Jordan comprises of several hills with 750 m above sea level as an average. The maximum elevation of the surrounding hills is 918 m above the sea level. Amman city with an area of 7579 km2 is located on the north west of Jordan with more than four million citizens (Municipality of Greater Amman, 2019). It is about 360 km north of Red Sea (Gulf of Aqaba) and 80 km from Irbid city a major city in the north. The Jordan River and the Dead Sea are located 45

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km to the west. Petra, the famous city is about 200 km south of Amman. Regionally, Amman is located at the center of the nearby countries as it marks the Silk Road, for instance Jerusalem, Damascus, Baghdad and Makkah (Fig 1).

Historically, Amman is one of the oldest cities built on the ruins of an ancient city known as the Rabbat Ammon, then Philadelphia (Fig. 2) and finally Amman, which is derived from the Ammonites. It is one of the four major capitals of the Levant. Recently, it becomes the capital of the Emirate of East Jordan and then the Hashemite Kingdom of Jordan after its independence in 1946. Modern Amman is the home of diverse population of different ethnic who came from different regions such as Chechnya, Caucasus, Palestine, Syria, Iraq and money other countries (Daher, 2008; Ghawanmeh, 2002).

The Amman Downtown is located at the center of the capital and well marked as an economic and cultural center. Amman Downtown attracts several tourists because of its cultural and historical richness through time and space (Robert & Marpillero-Colomina, 2011). For instance, the old Al-Hussein Mosque is located at the commercial heart of the center which goes back to the earlier stages of the Islamic ruling (Khilaft) period. Amman Downtown extends from Ras Al Ain area to the National Library (Old Amman Municipality) and the Roman amphitheater along The King Talal and the Quraish Roads.

The major problem with the Amman Downtown is the overcrowding of traffic and pedestrians. The maintenance and sustainability of the ancient monuments and old buildings represent a big challenge for the planning governments and agencies as it represents a heritage for Jordan (Alnsour, 2016).

MATERIALS AND METHODS

The history and Development of Amman city

The city dates back to more than 7000 years BC, and has undergone many civilizations, evidenced by the ruins of the city. The Roman staircase is one of the remains of the Romans and the mountain of the castle with its various monuments indicates the Greek, Roman, Ammonite and Umayyad civilizations. The stoned stoning in Jabal Amman overlooking Wadi Saqra is one of the remaining prehistoric civilizations to worship nature such as sun, moon and stars. The Ammonites, who gave the city their name of Ammon, and the goddess means the capital or the king's house and then changed with the passage of time as the goddess Ammon which remained until the Umayyad to become Amman (Robert & Marpillero-Colomina, 2011). The Downtown developed significantly through time (Fig 3).In 1956 the first structural plan for Amman was developed

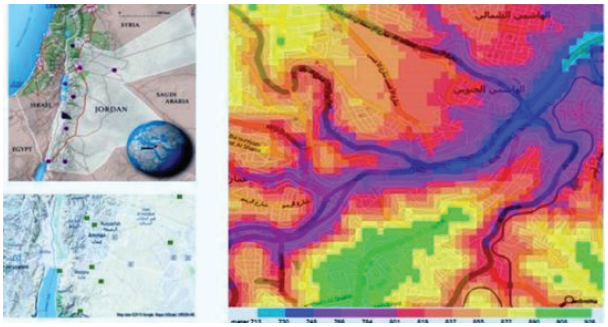

Fig. 1: Map of Jordan showing the location of Amman Downtown (Municipality of Greater Amman, 2019).

Fig. 2: Amman in 1892 showing the Roman amphitheater (Municipality of Greater Amman, 2019).

Fig. 3: Amman in (a) 1917, (b) 1927, (c) 1935 , (d) 1947, (e) 1958 and (f) 1958 (Municipality of Greater Amman, 2019).

defining the shape of the city, its functions, different uses, transport lines, and other functional features in a general way. In 1964, the commune of the city began to develop alter detailed norms that subsequently contributed to the realization of the contents of the organizational charts of the territorial planning in collaboration with some experts. The unexpected increase in the population of the city, controlled by mass immigration by the population in the neighboring region of the emotive of wars, hindered the development of the old global regulatory plan of the city, despite the many tentative initiate the process of development of the global regulatory plan. It has always been hindered by the same problems of overcrowding of the population, and the presence of areas abusive difficult to control and the uncontrolled construction of government agencies especially in the abusive areas (Ababsa, 2011; Abu Al-Haija & Potter, 2013; Abu Odeh, 1999).

Recently, the Great Municipality of Amman (GMA) has witnessed an important development, which expands in a thoughtful way that the city has never seen before. The city's new global regulatory plan has won international awards including the City's Global Leadership Award for Territorial Planning and the City Award for Asia 2007.One of the most important urban social problems in Amman today is the big boom in demographic growth and the scarcity of territorial urbanization. The city seeks to address these different problems, creating new informal areas, to respond to the Problems present in the city such as the lack of adequate housing, water bootable for the poverty of Jordan in the water at the Mondale level and the problem of urban traffic conditioned by various factors within the city.

The climate of Amman

Amman's climate is characterized by a desert-Mediterranean climate, warm temperate in summer and cold in winter. Visibility is reduced during the winter due to fog formation in the mountains. The highest temperature is recorded during July and August. Whereas, the highest level of precipitation is recorded during the month of January. The low altitude of the Downtown and being surrounded by seven hills threatens to cause water flood hazards in the lower areas of the city of Amman. This represents a major challenge, particularly with poor draining rain water system in addition to the problem of the infrastructure, which is old and not adequate to the development of the city (James, 2017).

The natural hazards is threatening marks particularly with the presence of abusive settlements of strong environmental degradation and the multi folds increase in the population of Amman which makes more than four million inhabitants representing about third of the Jordanians population according to the 2017 national census (Disaster Risk Management Profile, 2008; The World Bank, 2014).

Amman suffers from several obstacles such as providing water electricity and sewerage services. Low rainfall annual average influenced the Jordanian climate with the increase in desertification, the smog and the CO2 increase beyond the highest levels in the center of Amman (Abu Al-Haija, 2011; Greater Amman Comprehensive Development Plan, 1987).

Jordan Disaster/Hazard Profile highlights that Jordan has experienced several consecutive years of drought leading up to 2017. In 1999, rainfall decreased by 70 percent, affecting many people. Whereas, the Earthquakes is another issue which should be considered as Dead Sea Strike Slip Transform Fault passes though Jordan. Jordan's three largest cities (Amman, Zarqa and Irbid) are located within 30 km of the fault line and house more than 80% of Jordan's population. A seismic hazard map was produced for the region to benefit practitioners and policy makers concerned with seismic design (Al-Zoubi et al., 2006; Al-Zoubi & Abu-Hamatteh, 2007; Disaster Risk Management Master Plan Framework of Amman, 2009).

Disaster Risk Management Master Plan Framework of Amman (2009) included analysis on emergency management system; building code adoption, implementation, and enforcement, land use and environmental management. Jordan suffered number of hazards between 1980–2019 represented by

drought, extreme temperature, flood storm and earthquakes. The reported challenges/gaps are mainly (1) lack of financial support for institutions; (2) laws do not support local ownership and (3) lack of Planning and integration between the various institutions. Risk Assessment has been conducted for many area such as (1) Seismic risk assessment in Greater Amman, late 2008, sponsored by UNDP; (2) Seismic hazard assessment for building codes, 2000–2007, sponsored by USAID and USGS; (3) Seismic risk assessment for Aqaba, 2011, sponsored by UNDP and the SDC and (4) Joint assessment report for Jordan (Greater Amman Comprehensive Development Plan, 1987).

During the stage of drafting the current article the authors conducted deep brainstorming based on the available facts regarding the weak infrastructure and readability of the Downtown. The Downtown suffered a very catastrophic flush flood resulted from unexpected heavy rain during the month of February 2019. This incident indicates the poor infrastructure of the downtown and show a clear failure I the strategic planning to develop the area. Amman's Roman Theatre is a 6,000-seat, 2nd century Roman theatre. A famous landmark in the Jordanian capital, it dates back to the Roman period when the city was known as Philadelphia. The famous Roman Theater was fully covered with flooding water, roads pavements destroyed at many places and hundreds of shops covered completely with water resulting in a great financial lose (Fig 4).

The Diversity in the Downtown

Population growth is remarkably increasing in Jordan, Particularly in the Capita, as it hosts most of the economic activities. Population growth shows a sharp increasing trend starting from 1950 to 2017. The Downtown as well is a target for many investors from all the regions and from abroad. The rapid growth of population has led to random areas and congestion in commercial areas and poor coordination. The population exceeded ten million by the year 2017 and expected to touch 18 million by the year 2025 as registered by Statistics and Information Center (The World Bank, 2014). The old infrastructure, roads and pedestrian paths represent a thump in the Downtown unlike many other areas in Amman. The road network in the downtown is very poor with minimum width for both main roads (22 m) and secondary roads (12 m) as they are not meeting the congested and heavy traffic demands (Agatino, 2014; Jordan Statistical Yearbook, 2017).

There are many services available in the area both for merchants and for tourists and for those who are close to the area. These includes mosques, churches, hospitals, public pathrooms and government buildings.

The Downtown hosts lots of landmarks of the country. For instance, Al-Husseini Mosque which is the oldest mosque in the Jordanian capital was founded by Prince Abdullah Bin Al Hussein in 1923. It was named after Sharif Hussein Bin Ali (The commander of the Great Arab Revolt in the Arabian Peninsula

Fig. 4: Water flooding in the Downtown, February 2019

Fig. 5: the Way of Nymphaeum, Downtown, Amman.

and Levant). The Al-Husseini Mosque is 58.5 m long and 12.5 m wide. It has a front hall and two side galleries. In the middle is a heavenly square, two minarets that rise right 70 m and the left 35 m. the grand Mosque of Husseini is considered the first urban project to build in Amman. The building started in 1924 and was completed in 1927.

The Husseini Mosque is built over the ruins if the old Umayyad Mosque. The old mosque consisted of bowl surrounded by three arches which are mounted on columns and then a prayer house whose ceiling is also mounted on columns. The mosque was built with regular stones and the façade overlooking the mosque was decorated with colorful mosaic blocks.

Nymphaeum is located on the side of Amman old stream, running through the Downtown. It dates back to the Roman period of the second century AD and which is aesthetical and unique monument (Fig 5).

The markets in the Downtown reflect the deep Arabic and Islamic cultures and their tradition. The Downtown of Amman is very rich in shaded markets, with unique names reflecting the roots of establishment. The names are part of the tradition of the market itself and sometimes it indicates the types of business and function such as the Sukkar (Sugar) market, Bukharia market, Al-Juma'a market, Fruits and Vegetables market, Al-Yamani market, Grain market and Halal (Butcher) meat market. It is interesting to note that the Bukharia and Philadelphia markets are historical sites of ancient Amman, and stand as a witness of the long history of city. Such markets pinpoint the important of ancient Amman through time as they earn historical importance and heritage which should be preserved radically (Ababsa, 2011; Robert & Marpillero-Colomina, 2011).

The oldest market in the Downtown and probably in Jordan was established in the year 1942. The first mission of Sheikh Kamal Al-Din Al-Bukharia after arriving from Medina was to establish the old Bukharia market in the eastern square of the Husseini Mosque in 1943. The market remained in its position until a fire broke out in the area and it was reconstructed in a nearby area along King Talal Street opposite to Husseini Mosque (Fig 6).

Fig. 6: Bukharia a Market, costume jewelry.

RESULTS AND DISCUSSION

The traffic jam and congestion (Fig 7) is a very serious problem in the Downtown of Amman and is a recurring daily scene of overcrowding due to the traffic density and the pedestrian invasion occupation of the sidewalks by street vendors, hindering the movement of the population. The historic commercial center without architectural barriers, pedestrian obstructions, and with strong noise, visual and environmental pollution, and the minimum green areas (less than 4% of the total area) is dying constantly (Ababsa, 2011; Abu Odeh, 1999). Pedestrian traffic in the Downtown area is a major problem that causes congestion with the invasion of the peddlers on the sidewalk as the pedestrian crossing in haphazard ways and the lack of signs, created lot interference to the traffic movements. This act created unsafely environment especially for children by hindering the circulation and comfort of walking in the historical center of Amman (Ababsa, 2011; Alnsour, 2016; Abu Al-Haija & Potter, 2013).

Moreover, markets open directly to main roads and without any secondary roads to slowdown possible fast traffic, causing urban traffic congestion and hindering pedestrian traffic. As a matter of fact, the Downtown lacks the prober planning and organizations in terms of vision. Vision pollution is clearly demarcated in the area due to unorganized signs, good spreading on the sideways in addition to hawkers (Fig. 8).

The problems of environmental pollution are noise, visual, acoustic and visual problems and other pollution problems (Abu Al-Haija & Potter, 2013; Abu Odeh, 1999). Such problems may be listed as followings:

1. Low architectural quality in the area;
2. Interference between Population and urban traffic;
3. Environmental pollution, noise over 100 db;
4. Low quality infrastructure and bad smell especially in the historical center;
5. Loss of pedestrian spaces caused by the invasion of the sidewalks by street vendors and
6. Violation of civilization due to the insecurity of pedestrian traffic, and the scarcity of green spaces.

The historical Amman Downtown can be a worldwide attraction center if conserved. The accessibility to the Downtown of Amman and the movement within the center is very difficult due to the lack of public attitudes and the strong presence of high level visual, audio and environmental pollution such as the acoustic approach. The lack of separate movements of pedestrian and automobiles creates strong interference of traffic movements especially in the center of the Downtown streets. In addition to the invasion of sidewalks by illegal street vendors and lack of indecent signs, marks the major problem to be put forward for critical solution (Abu Odeh, 1999; Municipality of Greater Amman, 2019; Robert & Marpillero-Colomina, 2011).

Fig.7: Traffic congestion of overlapping pedestrian movements with cars.

Fig. 8: Movement of pedestrians and hawkers in the historical Downtown.

CONCLUSIONS

The city of Amman is a very important city hosting many historically remarks back to the ancient Roman, Greek and Muslim wealth. The architectural and urban development has been stagnated by various stages of spontaneous immigration due to wars in the surrounding areas; these wars have affected the development and growth of the population. The sudden population increase made a great pressure on the various service sectors, particularly with poor infrastructure. 50% increase in the resident population within the last 10 years has created new forms of abusive construction, education, refugee camps creating obstacles to public bodies to be able to respond to these new settlements leading to sever problems of viability and urban planning.

The Downtown is threatened on regular basis by the natural hazards which may take place at anytime. Flooding, represent a major risk, particularly with its poor drainage system infrastructure. Despite of the fact that Quraish Street is overlain by a two huge storm-water box culverts (6m*4m each) run for about 4.7 km, flooding is experienced almost every year in the area subjected to the current study. Surprisingly, yet no effective solutions have been put forward so far. Earthquake hazards is another major problem as the Downtown is located at the lowest point of Amman and surrounded by seven heavily populated hills, remarkably with old structures goes back to the 1940s.

In order to develop, improve and maintain the Amman Downtown for all aspects, major and serious steps should be taken including conducting comprehensive investigation aiming at minimizing the expected natural hazards risk and to safe the heritage and historical record of the area. The following recommendations may be adopted:

Organization of the display of advertising panels within the urban center with a specific combination of colors according to the architectural style and the general character of the urban area.

Removal of random areas that constitute visual distortion, such as the vegetable market and replace it with a woody aesthetic area.

The Downtown should be a place for social gatherings beyond the commercial one and should be visually and aesthetically pleasing, and at the same time it must be enriched with flowers and trees that help to reduce air pollution.

Strictly reengineer the movement of vehicles and pedestrians in order to achieve the fluidity and harmony of transport and reduce air and noise pollution and congestion. However, the vehicles may be stopped from entering the Downtown through establishing well distributed vehicle parks, as the visitors continue their shopping and\or entertainment using

governmental environmental public vehicles.

Enforce the law and regulations by the Municipality of Amman and organizing committees to encourage public to respect and preserve the visual and aesthetic elements.

The flooding problem should be contained through putting serous short and long terms engineering solutions to avoid any further problem. This could be achieved through diverting the rain water channels for draining the Downtown.

More caution should be given to the construction specification within the area in terms of strictly applying earthquake codes.

Further detailed investigations should be carried out to cover all the aspects of development within the area. Moreover, comprehensive achievable plans should be adopted and implemented to overcome the critical condition at the Downtown.

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