

## **SANA'A URBAN TRANSFORMATION: FROM WALLED TO FRAGMENTED CITY**

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*(Received April 2, 2011 Accepted June 15, 2011)*

*The recent rapid uncontrolled urban transformation of Sana'a city is a significant example of the historic core of most Arab cities with regard to its formation, growth and development. Sana'a city has expanded from merely 3.7 square kilometers in 1962 to more than 1,600 square kilometers at the end of the 2010.*

*When El-Sheshtawy (2004) presented the evolution of Arab cities, Sana'a city was discussed under "the cities affected by globalization phenomenon". That has had an extremely uneven impact on Sana'a. When Sana'a compared to the cities in the region, globalization is not necessarily a central issue for Sana'a city. In fact Sana'a shares the fragmentation phenomenon with the rest of the cities in the region. This is the point from where this paper starts.*

*The approach of this paper is based on both diachronic and synchronic readings of the historical and new city. It will discuss:*

- *Urban transformation approaches.*
- *Phases of Sana'a urban form fragmentation.*

*This research pinpoints the current spatial and environmental problems facing the new and the old urban fabric as consequences of urban form fragmentation. Though it doesn't aim to reach conclusive results, the study hoped to provide a conceptual background for the present debate on city's urban future.*

**KEYWORDS:** *urban transformation, urban fragmentation, historical walled gated city, new urban fabric*

### **INTRODUCTION**

During the last fifty years Sana'a city has sprawled outside the walls to be a metropolitan city. The total area of the city expanded from merely 3.7 square kilometers in 1962 to more than 1,600 square kilometers at the end of the 2010. The old walled city today is the smallest district in the city represents only 1/400 of Sana'a metropolitan mass (World Bank, 2008)

The recent rapid uncontrolled urban transformation of Sana'a is a significant example of the historic core of most Arab cities with regard to its formation, growth and development. It presents an interesting case of a traditional urban culture that is in transition having been under many development pressures and internal driving forces, symbolizing the interaction between continuity and change, deconstruction and reconstruction, as well as heterogeneity and homogeneity (A.E.C, 2005).

Several studies have dealt with the phenomenon of urban transformation of Sana'a city. Mathews (1980) argues that the old city of Sana'a has satisfied the needs of the people until the recent times. Today's problems such as traffic congestion were never imagined when the city was built. Once the isolation of Yemen was ended in 1962, town planners copied western styles and used imported buildings codes and regulations during a time that lacked local planning legislations.

Vernada (1981) describes Yemeni cities including the styles, materials and building techniques. Vernada depicts the change in housing styles that emerge in Yemen. He pointed out that new houses types were introduced. Urban apartment buildings built in concrete up to four stories. The change in social and economic status identified is reflected in somewhat disordered ornamental display both in color and texture.

Hirshi and Hirshi (1983) introduced a comparative analysis of architectural styles in several locations in Yemen such as Sana'a, Dhamar, Jiblah and Zabid. The study provides a comparative analysis of vernacular architecture in terms of local styles. They pointed out that because of pressures of social and economic change in Yemeni society, the importance of taking urgent action to conserve the vernacular architecture should be taken seriously.

Al-Sabahi (1996) discussed the impact of modernization and socio-economic change on Sana'a. He provides a comparative analysis of the traditional and modern sectors in Sana'a with regard to architectural expression using traditional and modern case studies.

Al-Sallal (2004) stated that the modernity of Sana'a resulted in many random housing and commercial areas, which have been developed with poor infrastructure and services. Unfortunately, the city that was once perceived as a model of harmony, cultural identity and ecology is now surrounded by new areas that suffer from the predicament of many modern cities, including environmental, cultural and functional problems. Al-Sallal presented the ecological issues and comparative analysis of architectural transformations.

Sana'a city was discussed under the cities affected by globalization phenomenon El-Sheshtawy (2004). That has had an extremely uneven impact on Sana'a. When Sana'a compared to the cities in the region globalization is not necessarily a central issue for Sana'a city. In fact Sana'a shares the fragmentation phenomenon with the rest of the cities in the region. This is the point from where this paper starts.

This paper's approach is based on both diachronic and synchronic readings of the historical and new city. The first is focusing on Sana'a urban history, whereas the second is based on utilizing both phases of urban fragmentation growth and urban fragmentation model as methodological tools.

The objective of this paper is to address the phases of urban form fragmentation. Though it doesn't aim to reach conclusive results, the study hoped to provide a conceptual background for the present debate on city's urban future. In addition to the introduction and the conclusion the study is organized in four parts as follows:

1. Urban transformation approaches.
2. Sana'a urban perspective.
3. Sana'a urban form fragmentation.

4. Spatial problems as consequences of Sana'a urban form fragmentation.

## 1. URBAN TRANSFORMATION APPROACHES

Urban transformation takes place as a part of the nature of the city dynamics. However, transformation is not an entirely new phenomenon; it may simply be “an old Do'oany honey in a new bottle”.

Different approaches have tackled the phenomenon of urban transformation.

### 1.1. Industrialization vs. Globalization

Starting from the 18th century, European and many other countries in the Middle East were faced with the challenge of modernizing pre-industrial urban fabric. Their efforts both facilitated and mediated the emergence of a capitalist market. The new economy required roads and railways that could not be accommodated within existing cities. Old urban cities were progressively abandoned by the new bourgeoisie and were left to the working poor. (Daniels, P. 2004).

Moreover, major cities all over the world are unavoidably under the influence of transformation due to the fact that new millennium is the age of rapid spreading of information and online communications. There is a major difference between the era of industrialization and that of globalization issues of transformation.

In the first era there was separation in geography of rural and urban; while in the second, the location in geography was not as significant. Thus during the first era, the urban areas increased at the expense of rural areas by in-and-out migrations to the areas where capital is to be produced. In this era, urban growth spanned for a long period of time to take place. For example, it took London from 1800 to 1910 to multiply its population by seven, from 1.1 million to 7.3 million.

In the second era, one could be less dependent on physical location and still be in touch with the world. However the growth rate was a sudden shock to most developing cities. London's growth rate has been achieved by some African cities within a generation, (Thorns, 2002).

### 1.2. Struggling vs. Emerging

El-Sheshtawy (2008) in his book "The Evolving Arab City" examines the growth of eight Arab cities and divides them into two thematic sections.

The first section is "Struggling Cities". It examines older cities that have traditionally served as regional centers: Rabat, Amman and Beirut. They are traditional centres desiring to move away from the restrictions of tradition and to embrace modernity. Cairo, Baghdad, and Damascus used to be the intellectual, cultural, social, and political centers for the Arab and Islamic world. These cities have structured the models of development in the Middle East, even after the oil boom in the early seventies. Due to long conflicts and the complexity of their recent political situations, both Baghdad and Damascus lost their capability of sustaining their sense of leadership. Hence Cairo is left alone as the only old center struggling to maintain and develop its previous status. Historically, Cairo exercised strong influence on the whole region of the Arab world. This influence can be traced culturally, politically, socially and architecturally. However, the city is losing its regional leading role. The status of

these cities is a reflection of struggles to cope with problems caused by political conflicts, massive population growth, urban sprawl, economic failures and growing poverty rates (Mahgoub, 2009)

The second section is "Emerging Cities". It examines newer oil cities from the Arabian Peninsula, including Riyadh, Manama, Kuwait, Doha and Abu Dhabi. These emerging cities are eager to assert themselves as world cities and search for a role in the world order and not mere producers and exporters of oil. Cities in the Arabian Gulf region are eager to reassert themselves as world cities. Riyadh, Kuwait and Manama are reintroducing themselves as regional capitals and investment centers, while Doha and Abu Dhabi are emerging as global sport, educational and cultural centers. Tracing Dubaiization phenomenon, these cities are competing today to create the largest, the tallest and the biggest physical settlements and built environments. Examples like Dubai's Khalifa Tower, Bahrain's Financial Harbor, Qatar's Pearl Development, Oman's Blue City and Riyadh's Desert Islands are all evidence of the kind of scale these cities are adopting. Even though large scale developments and massive urban sprawl are substantially changing the original form of these cities, they advocate preservation policies to revive the cities' old center that is degrading under the influence of new development and rapid urbanism of globalization (Alraof, 2005; Pacione, 2005; Acuto, 2010; Sklair, 2010; Bassens et al. 2010).

### **1.3. Economic Growth vs. Social Segregation**

The literature dealing with urban segregation in third world countries revealed that the growth of cities reflects the growth of economy. The economic means in urban environment though, played the major role in social segregation. It seems that squatter, informal and ghettoization settlements in urban environment were a combined result of a housing allocation policy, urban renewal policies and suburban zoning regulations.

In general terms, authors like Lima (2001) and Roitman (2005) indicate that the social segregation in the city associated with "the spatial separation of the different social groups in a geographical area according to ethnic, religious or income differences, among others". In this form, it is possible to visualize in a city the different districts where each social group has its own specific space. In the case of the segregation based on differences of income, the relations of being able and subordination become evident. The high-income groups can choose their residential location, while the impoverished groups are more dependent to the offer of informal housing.

### **1.4. Polarization vs. Fragmentation**

Urban built environment in most third world cities has been characterised by a clear succession of different development processes. As shown in Fig. (1), the initial phase was characterized by a compact gated city, in which the distance to city center indicated the social status of the dweller.

The second phase started by the demolition of the old walls to open linear boulevards. New residential, commercial and institutional structures oriented towards the highway lines. That led to two competing realities and bi-polar structures.

The third phase started with the rural exodus and the new doctrine of import substitution led to fragmented structures clearly separating the rich from the poor sectors of the city (Borsdorfa. A. & Hidalgob, R., 2008).

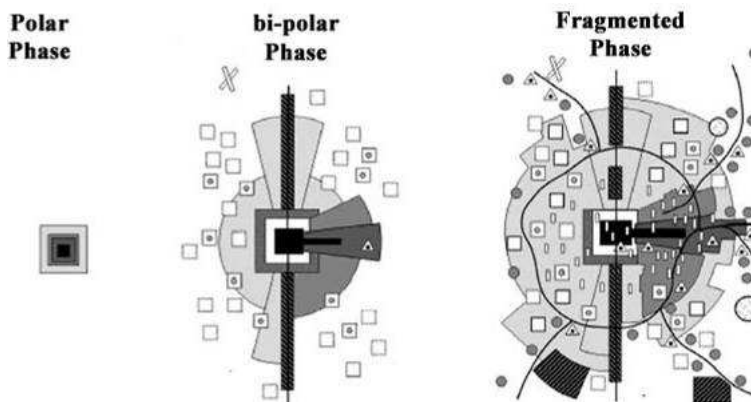


Figure 1: Phases of Urban Growth  
Source: Borsdorfa. A. & Hidalgob,R. (2008)

### 1.5. Urban Form Fragmentation( spatial sprawl)

Fragmentation, defined as breaking into fragments, is a phenomenon we all recognize. We observe it in that particular glass, we liked so much, falling to pieces on the ground or in the fireworks breaking into a golden rain above our heads. In one case fragmentation is much regretted; in the other case, it merely adds to the festivity.

In spatial planning, fragmentation is a well-known phenomenon as well. A first illustration can be found in the field of urban land use. Comparing today's cities with those of the 18th and 19th centuries, urban land use is far more fragmented now. The 20th century phenomenon of urban sprawl illustrates this point very well. Different factors have played a role in the emergence of such phenomenon. These include factors such as population growth, increase in mobility and welfare and growing per capita consumption of space. (Hiding, M. & Teunissen, 2002)

The city of the developing countries shows a distinct spatial pattern characterized by the variety of the physical environment or the fragmentation of the urban space. The fragmented city is the accidental outcome of the form, socio-spatial and institutional conflicting forces. As shown in Fig. (2), these driving forces have contributed to the Third World city to be spacewise.

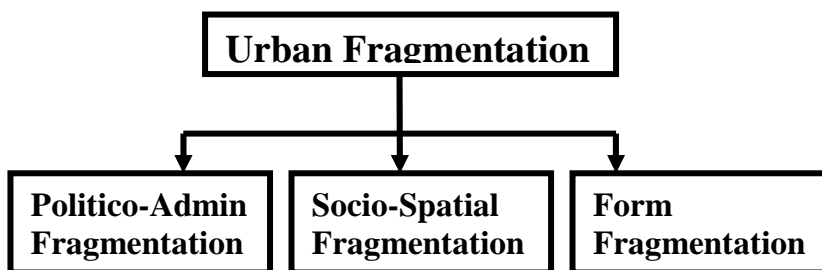


Figure 2 : Urban Fragmentation Model, Source: Leon (2009)

In Arab countries, the urban fabric of the old cities has changed dramatically over the few last decades. The medieval Islamic cities in the region had an organic urban fabric which exhibited a high degree of cultural identity and unity. However, the modern overall urban fabric of these cities reveals no cultural identity, continuity or unity.

Each fragment presents a different physical character and a separate social and economic environment. The fragmentation of urban fabric, poses two problems which require immediate attention.

First, the historic urban core is losing its historical, cultural and economic substance.

Second, the urban fabric of the new urban sprawl demonstrates uncontrolled urban growth and Sana'a city is not an exception (Leon, 2009).

As politico-administration fragmentation and Socio-spatial fragmentation are beyond the limits of this research, this paper concentrates on the Sana'a urban form fragmentation (spatial sprawl). However, before presenting the urban form fragmentation in Sana'a city next section shades light on Sana'a urban perspective.

## 2. SANA'A URBAN PERSPECTIVE

Sana'a, by far Yemen's largest city, is the political and administrative capital and the most important cultural center in the country. Old Sana'a has been declared by UNESCO as a World Heritage Site. Sana'a also was named the Arab world's Capital of Culture in 2004. The old city has a unique urban and architectural patrimony that dates back 2,000 years. The urban and architectural fabric within the city walls remains primarily intact.

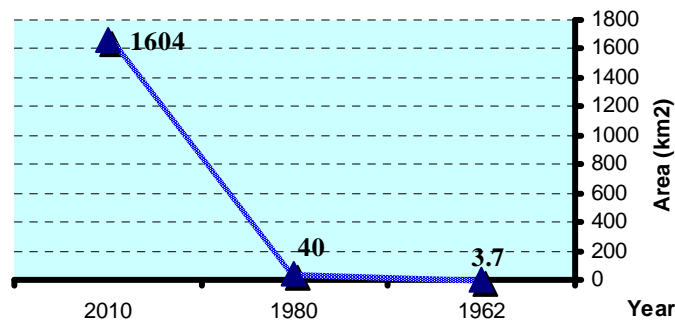


Figure 3 : Expansion of Sana'a's Area 1962-2010

During the last fifty years the city has been sprawled outside the walls to be a metropolitan city. As a result the total area of the city expanded from merely 3.7 square kilometers in 1962 to more than 40 square kilometers in the end of the 1970s. According to the most recent satellite image for the city of 2010, the inhabited area today is around 194 km<sup>2</sup> (103 person/hect.) out of 1604 km<sup>2</sup> (12.5 person/hect.) (Fig. 3)

As illustrated in Fig. (4) Sana'a City currently contains approximately two million people, up from an estimated 427,500 persons in 1986 and only 162,000 inhabitants in 1977 and 50,000 persons in 1962. This represents an average annual growth rate of over 7 percent over the last 30 years. This is extremely rapid rates of city growth (World Bank 2008).

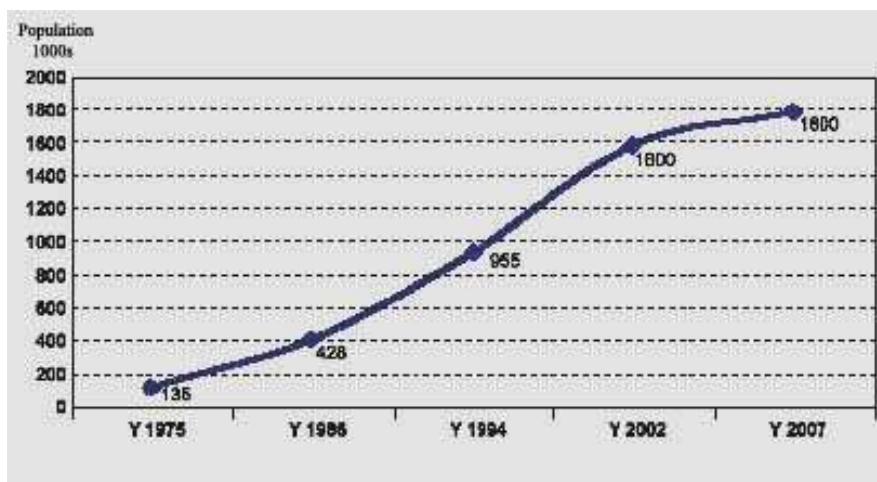


Figure 4: Growth of Sana'a's population 1975-2007  
Source: (World Bank 2008)

This demographic increase has been paralleled by a dramatic increase of the urban/inhabited built-up area of the city.

Poverty incidence in Yemen is very high with 40.1 percent of the population in rural and 20.7 percent of inhabitants in urban areas falling below the poverty line. As indicated in Fig. (5) in Sana'a, the poor account for 23 percent of all residents. High inflation rates of between 10 percent and 20 percent during the past five years combined with low per capita income growth (0.7 percent per annum) and a skewed distribution of growth in the favor of the better-off suggest have impoverished part of the middle classes during the past two decades.

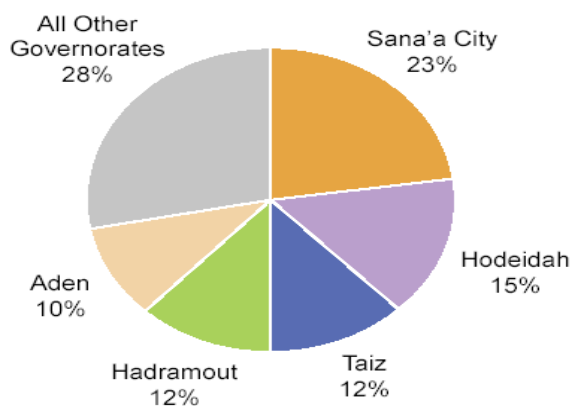


Figure 5: Distribution of the Urban Poor in Yemen  
Source: (World Bank 2008)

Despite government efforts to orient public policies towards the poor, all indicators suggest that poverty incidence in Sana'a cannot be expected to decline significantly in the near future. Moreover, it must be highlighted that poverty lines are

rather arbitrary and that there are large numbers of people living just above the poverty line and are vulnerable to falling below it (World Bank 2008).

Bound by mountains and steep slopes to the east and west, the city has few options but to expand primarily along its north and south axes.

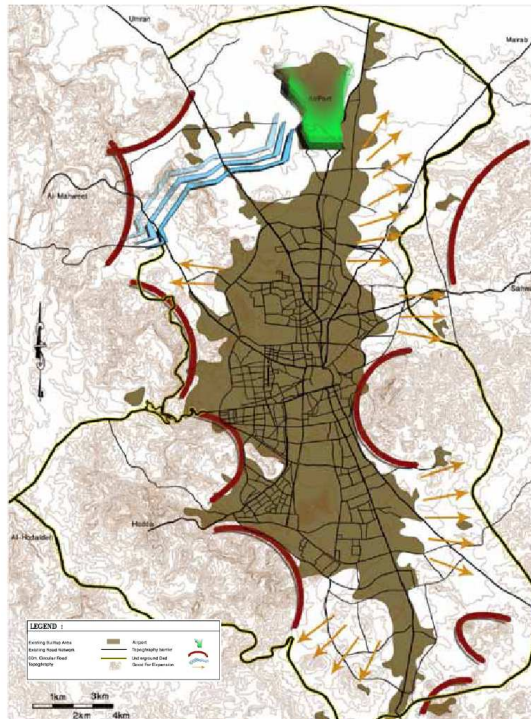


Figure 6: Constraints to development and main Areas of Expansion 2005

Source: Madbouly (2008)

Furthermore, the location of the international airport together with the main sewage treatment plant in the north also constrains development in that direction, leaving the southern axis as the main path for the city expansion. (Fig. 6).

### 3. SANA'A URBAN FORM FRAGMENTATION

Under the rapid pressures of modernization and massive urbanization, Sana'a city has been fragmented since 1960s. The ties between this part of a past inside the old walls and modern urban reality outside the walls have been weakened. By utilizing the urban fragmentation model (see Fig. 1) the city has undergone three fundamental phases of fragmentation. These were as follows:

- Polar phase: until 1960's, the historical walled city was a gated city by itself. The city inside the walls has proved independence, strength, originality and a sense of place uniqueness by using to the fullest, its own peculiar quality.
- From 1970s a new urban organism outside the walls diffused. The new urban expansion could not tolerate any similar body. Two consecutive scenarios had happened:



- Bi-polar phase: until 1980s, the old walled city was a city competing with the modern city outside the wall. The modern city neutralized the diverse old body, removed its voice, in practice embalmed it as a monument. Under the threats of historical city dying, safeguarding the historical city advocated. The conserving was only the physical structures, the facades and the empty shapes. No one could have been able to prevent life from departing.
- Fragmented phase: from 1990s until now, the old walled city has been digested by the modern city. It has been flattered out and forced to express conditions of habitat and functioning levelled on those of the other city districts. The new urban form has been scattered to fragmented land use and to heterogeneous gated communities rather than homogenous communities in the old walled gated city.

### **Polar phase: Sana'a as it was at the Sixties (The historical walled gated city)**

Old Sana'a like many other old Islamic cities is made up of a mix of cultural layers, from different periods –pre-Islamic, Islamic, medieval, to pre-modernization (Fig. 7). This overlapping of historic layers indicates a long urban development process – formation, growth, development, change and transformations as well as many interactions throughout time and place.

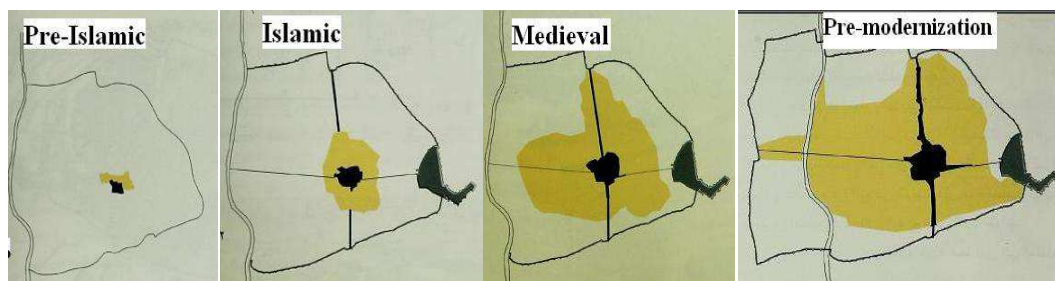


Figure 7: Old city growth

Source: Al-Taher Engineering Consultant (A.E.C) (2005)

The juxtaposition of various urban types and building forms representing different historical layers generates contradictions and inconsistency and may lead to deterioration. For example, the East wing and West wing of the old city illustrates the juxtaposition of various urban types and building forms; monumental forms, traditional dwellings, major streets and squares, etc. They all represent different historical layers and may generate contradictions (Muslims and Jews) and inconsistency in some cases. This example shows that each subsequent layer induced “chemical reactions” to other layers and invariably led to many transformations and adaptations in their structures. Consequently, each layer may add to the urban form a number of architectural and urban elements, creating a relatively homogeneous and integrated whole. Political events as well as economic, social and cultural changes throughout the history of the city have affected this historic development process and contributed much to its morphological characteristics. The continuity of cultural and social life throughout the city's history, which can be seen in the wealth of religious and cultural events and

venues, is strongly reflected in its urban patterns. Al-Taher Engineering Consultant (A.E.C) (2005). As shown in Fig. (8), at the beginning of the sixties, the old city was a walled independent city.



Figure 8: The old city at the beginning of the sixties  
Source: Lewcock (1986)

The city covered slightly less than 130 hectares, and had the form of a butterfly with extended wings following an east-west orientation surrounded by an unbroken wall and crossed from south to north by seasonal water course, which collected most of the water from the catchment basin around the city (Fig. 9)

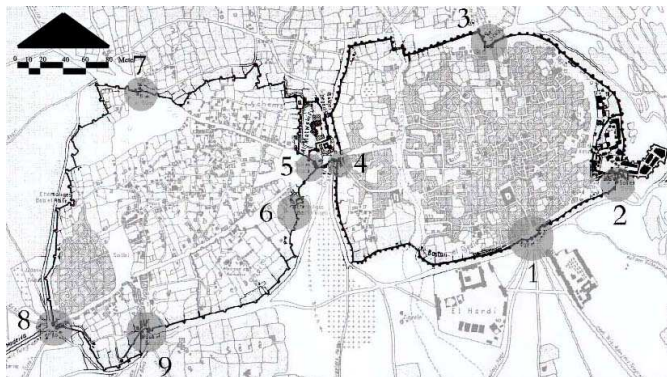


Figure 9: The historical city as it was at the sixties  
Source: Abdo (2002)

The importance of Old city is reflected through several factors (Oshaish, A. 2010):

- A large number of historic buildings (about 6,500).
- A castle and a long historic wall and (9) gates (Bab-Al-Yemen the only existing gate. It is the gate number one in Fig. 9, see also Fig. 10)
- 48 historic mosques, the Great Mosque which is considered as one of the oldest mosque in the Islamic world.
- A most active historic market (*sug*) (2000 shops, 48 specialized market and 26 caravansaries (*samsarat*) with vibrant artisanship.
- 12 public baths (*hamams*).



Figure 10 : Bab-Alyemen, Source: Abdo (2002)

- A most sophisticated built environment with an architectural and urban intricacy with (43) green open spaces (meqshamas).

Features of the old city are as following:

- The old city is characterized by its Yemeni unique style, and the features of Islamic style appeared in schools and mosques.
- The city looks as one structure.
- It is characterized by its circular planning that harmonizes with the nature of walled Islamic cities.
- It is a fine city, highly populated, and characterized by vitality and activity.
- It covers an area of 156 hectares.
- These factors, and the dynamic urban evolution, render Sana'a a unique self sustained Islamic capital.

### Bi-polar Phase: Two Entities Beyond the Wall (The Old Walled City a Neutralized City)

The opening of the country to the outside world in the 1970s, and the growth which accompanied the decision to make Sana'a the capital of the new Yemen Arab Republic, posed new challenges to the old city.

Modernization impact and scope, however, were limited by particular political conditions. Dresch (2000) argues that while the 1962 Revolution signified a transition from darkness into light, the phrase “before revolution” really meant “before the remittance boom” of the 1970’s when hundreds of thousands of Yemeni men migrated to work in the booming Gulf States.

**Table 1: Population and area in Sana'a City (1975-1981), Source: Al-Sabahi, H. (1996)**

	1975				1981			
	Popul.	%	Area (hect.)	%	Population	%	Area (hect.)	%
Historic	37,600	29.5%	130	11.5%	41,000	19.5%	130	0.06%
New city	90,000	70.5%	1,000	88.5%	160,000	80.5%	2,000	99.94%
Total	127,600	100%	1,130	100%	210,000	100%	2,130	100%

The huge influx of immigrants' remittances from the oil boom in neighbouring countries, combined with a rapidly growing population, placed considerable stress on the old city's historic buildings and its inadequate infrastructure. Sana'a grew extraordinarily fast as oil workers returning home invested their money in property.

The population grew from about 127,600 in 1975 to 210,000 in 1981 (Table 1). Urban Yemenis abandoned their houses because they could not afford to maintain them and preferred new villas out of town. The main shopping, banking and government services shifted out of the old city, mainly to the west and northwest.

Educational, recreational, entertainment and health facilities also moved away to an area outside the walls. Wealthier residents moved away due to the unsanitary condition of the streets, lack of services and the relative inaccessibility of their houses by vehicles. They relocated to areas that promised a modern lifestyle adjacent to new facilities. Lower income Yemenis moved in to the old city and conditions deteriorated.

Economic development in Sana'a made the introduction of modern construction technology unavoidable. New reinforced concrete structures became eyesores alongside the traditional buildings. Additionally they proved to have adverse effects on traditional construction materials. Concrete's inflexibility cracked surrounding brick and deposited salts that deteriorated the soft traditional materials. As a result of modernization efforts in the old city, including the introduction of water and sanitation systems without adequate drainage, thirty historic houses collapsed between 1978 and 1979.

In the course of only a decade, well-to-do middle class families fueled the spectacular and largely unplanned growth of the city. By 1970 the built area covered an area three times the size as it was in 1962. In 1971 it was still the dominant physical and social space of the city. By 1982 it occupied a twelfth of the total urbanized area, and housed only one fifth of the population. As late as the 1970's the old city was Sana'a, and the new districts were outside the city. But this original Sana'a was not restricted to the central core. It included the old suburbs that were still partially surrounded by walls.

However, Tahreer Square was developed into a new commercial center competing with the old city market. Fig. 11 below indicates that two different and separate cities come together to form the entity of the capital city of the country.

The two expressions are not all the same thing. It is two component realities, two urban realities and consequently two autonomous neutralized cities.

There is a very real danger of the old city's dying. The list of physical, economic and social problems that are afflicting the old city is formidable. Therefore efforts to save the old city started to appear. Next section presents the first international campaign for safeguarding and conserving the old city.

### **3.2.1. Sana'a Preservation Campaign and Action Plan (after Declaration as a World Heritage city)**

Because the urban expansion of the 1970's and 1980's had begun to threaten and eventually destroy the old city, in 1984 the Republic of Yemen created the General Organisation for the Preservation of Old Sana'a. By 1987, it extended its responsibilities to all of Yemen and became the General Organisation for the Preservation of the Historic Cities of Yemen (GOPHCY).

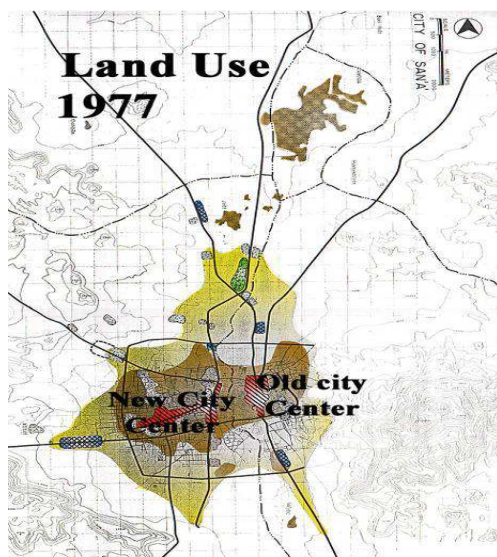


Figure 11: Two competing entities Old and New city centres  
Source: Berger/Kamsax (1978)

UNESCO and UNDP assisted the preservation planning process. The Yemeni government and international cooperation provided technical assistance and funding.

According to Lewcock (1986) there was a tension in the 1982 mission between two different views of conservation. He and “Abdelkafi”, both architects, argued that “like Venice” the value of Sana’a derives from the whole fabric, not just monuments. The whole city should be considered a monument and also a living entity. Infrastructure works and street paving had to urgently be carried out, to improve living conditions and also to prevent damage to buildings.

Based on the concept of Lewcock, the campaign for conservation was successful in the promotion of numerous interventions. These have been an important contribution to the overall preservation of the historic and cultural heritage of the Old City. Amongst these:

- Old water supply and drainage systems were upgraded.
- About 50 percent of the city's streets and alleys have been paved with patterned bands of black basalt and white limestone.
- Numerous buildings dating from the 14th, 17th, and 19th centuries have been restored, adapted and some reused.
- The seasonal watercourse (*wadi*) has been remodelled to become an urban space.
- The city mud wall has been restored.

In spite of the successful campaign to safeguard the old city, the process of change has come to a very delicate turning point.

### **Fragmented Phase: The historical city a digested walled district, the new city a fragmented urban fabric**

By the end of 1970's, the increasing pressures of urban transformations led the government to give the physical planning more attention. The first Master Plan for

Sana'a city was prepared by Berger/Kampsax (1978). The Master Plan proposed that Sana'a city will grow in four phases until 2000 (Fig.12).

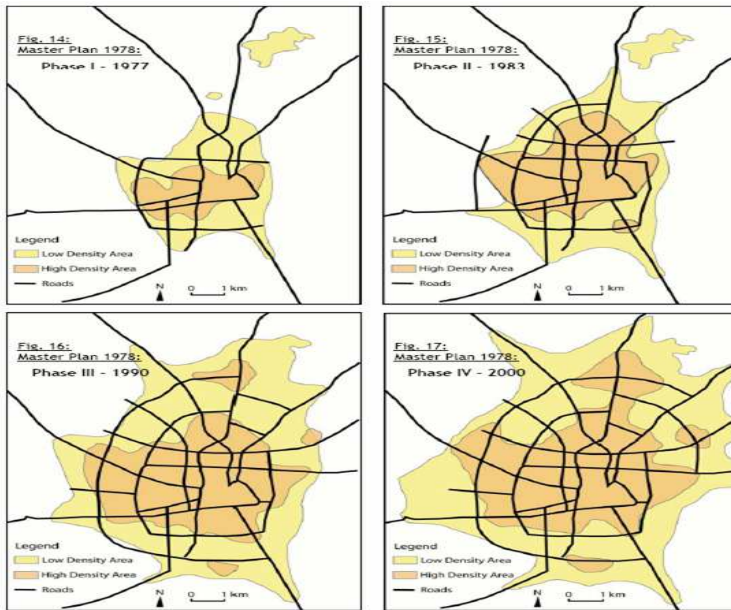


Figure 12 : Berger/Kampsax Master Plan proposal  
Source: Berger/Kampsax(1978 )

However, the city fragmented beyond the limits of all experts' expectations. As shown in Fig.13, in third phase the city grew 100% more than the proposed Master Plan.

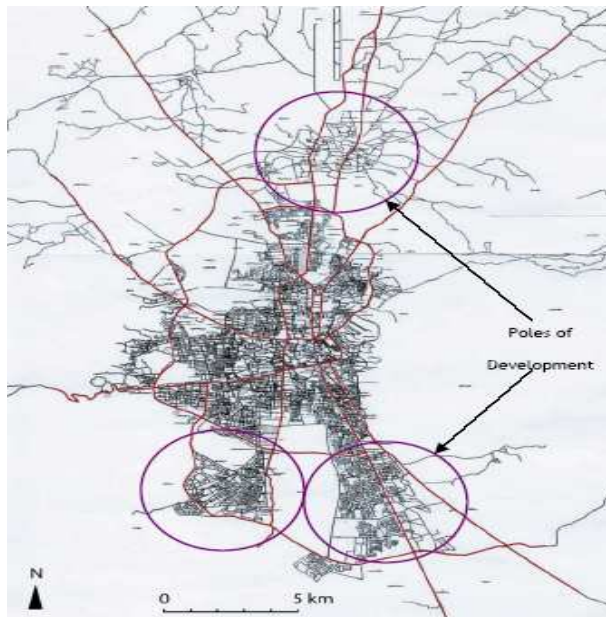


Figure 13: In third phase the city grew 100% more than the proposed Master Plan.  
Source: Survey Authority, Republic of Yemen, (2004)

To upgrade the first Master Plan a Cuban team was consulted by the government. The second Sana'a Master Plan also proposed three development stages until 2020 (Yemenis & Cuban Team, 1998). (Fig. 14)

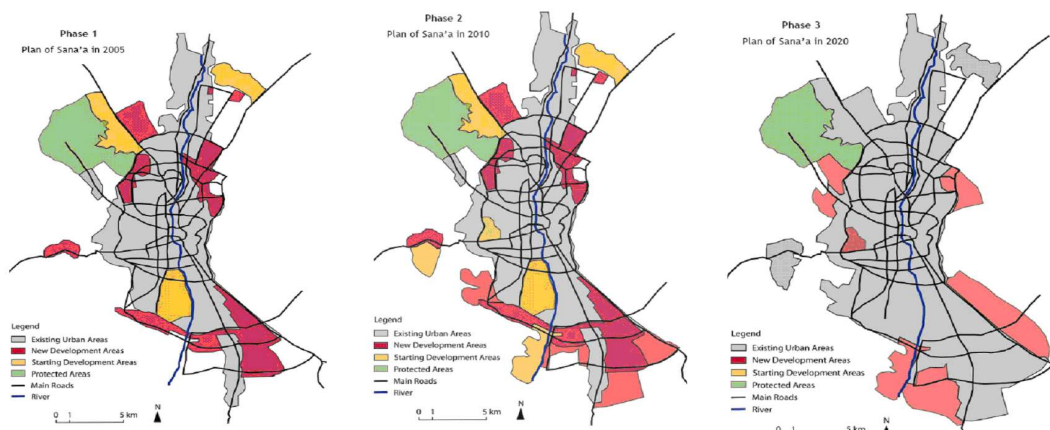


Figure 14: Yemeni & Cuban Team Master Plan Proposal  
Source: Yemeni & Cuban Team (1998)

The approved 1978 Master Plan has become hopelessly obsolete, and the 1998 Cuban-Yemeni master plan was never adopted. As a result, urban planning efforts concentrate on short-term problem solving rather than long-term strategic planning. The old city has been marginalized in the second Master Plan. Dangerous and widespread transformations of the new fabric are linked to the ongoing overall process of modernization. Therefore threats and uncontrolled urban transformation are facing both the new and the old fabric of Sana'a city.

#### 4. CURRENT SPATIAL AND ENVIRONMENTAL PROBLEMS FACING THE NEW AND THE OLD URBAN FABRIC OF SANA'A CITY

This section presents the current spatial and environmental problems facing the new and the old urban fabric as consequences of urban form fragmentation.

##### Physical and environmental problems facing the new fragmented urban fabric of Sana'a city

The city faces the following critical physical/spatial and environmental problems that would require actions:

- Low-density sprawl within the inhibited area of the city (15,000 ha.), results in relatively low residential gross density of 130 persons/ hectare, represents an inefficient process of land consumption process and lead to more expensive service delivery and to an overall less efficient urban pattern. Despite this relatively low density, some districts suffer from congestion and high density, e.g., the residential density within the Old Sana'a district exceeds 346 persons/hectare, while in El-Tahrir district reaches 245 persons/hectare. This disparity in population distribution calls for a wider look on more balanced distribution of

population among all districts through certain planning measures within the new proposed master plan such as enabling higher building densities within the relatively low-density districts and prohibiting any further development in the central parts within the city.

- Due to this problem of low development density and wide spread of buildings and fragmentation of land use in all inhabited areas, Sana'a faces today another problem which is the limited prime sites for investment projects. The majority of land parcels with highest values and/or highest development potential are already occupied by low development density and/or sub-optimal land uses from an economic efficiency perspective. In addition, a considerable number of land parcels today along main arteries and/or within inner city areas belong to the military or other governmental organizations which use those parcels in economically improper uses as camps, storages, administrative buildings (Fig. 15).



Figure 15: Fragmented land parcels along main arteries

- The most critical problem Sana'a city faces today is the proliferation of informal settlements. The phenomenon of informality mushroomed since the first Gulf war of 1991 with the return of thousands of expatriate workers, who settled on squatter land on the periphery of the municipality. There are 39 informal settlements. Unfortunately, there are no clear figures about the number of residents within those informal areas; however, they are all characterized with the absence of infrastructure and basic urban services and social segregation.
- In addition, the fragmented city lacks a city center. The commercial facilities are scattered all over the urban fabric of the city (Al-Abed, 2008). In spite of the various parks carried out by the city within the last five years in several locations especially on the peripheries (e.g., near the president palace) the city still suffers from the absence open spaces and parks within inner city areas which makes the share of each person from the open space is barely 0.4 square meter in comparison to 2-4 m<sup>2</sup>/ person in Arab countries in the Gulf. The city suffers also from its limited number of health and educational facilities in terms of public hospitals and



schools. Although the private sector has exerted several initiatives to fill those gaps, the road is still ahead for those basic urban services.

- Finally the city suffers from several environmental problems that affect the living conditions of the majority of population. Inadequate access to basic infrastructure (water supply and sanitation) together with the weak of solid waste collection represents the main environmental challenges facing Sana'a.

### **Current Changes Threatening the Integrity and the Heritage Values of the Historic Fabric of the Old Walled City of Sana'a**

In the old city, major threats are deserved to be carefully assessed. The survey carried out by Pini (2008) shows that very intense building activity has occurred in the perimeter in the last 15 years. In the residential quarters, 4145 buildings (i.e. 42% of the total) appear to have undergone interventions of different types. Amongst these interventions the construction of “new building” count for 31% of the total and are mainly concentrated in the new developments along the city walls, on the northern and southern-western sides, even if many isolated interventions can be found with the historic fabric. Adding to this the “reconstruction” and “redevelopment” of pre-existing buildings (6% and 5% respectively). It appears that 42% of the interventions have implied the construction of new structures. In other terms, about 18% of the buildings inventoried in the perimeter are recent. On the other hand, the amount of interventions of renovation (24%), rehabilitation (24%) and restoration (7%) show a high degree of maintenance and reuse, which may be considered as an outcome of the protection measures established and control on building activities enforced by GOPHCY since the 1990's, which have probably prevented a larger amount of reconstruction and redevelopment interventions. All of these interventions have modified, to a different degree, the traditional image of the city.

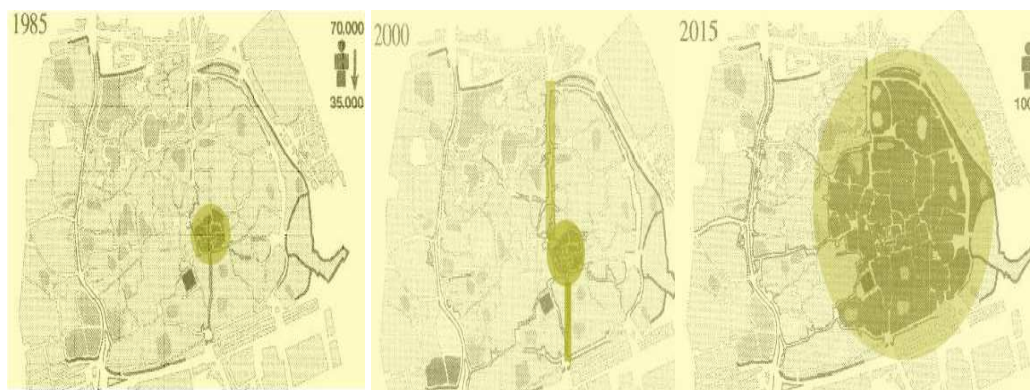


Figure 16: Sukization phenomenon  
Source: Oshaish (2010)

The uses of the ground floors in the whole fabric clearly show the spread of commercial activities in the residential quarters. This phenomenon not only concerns the new developments or the renewal areas along the city walls, but also the historic fabric especially along the axes which connected the central souk to the gate. This so called “sukization” is progressively mitigating the rigid zoning that used to

characterize the traditional urban structure (Fig. 16). This phenomenon is radically changing the streetscape and the overall urban image. The sky line is also affected by not only the new vertical buildings, but also by water tanks and satellite installations on the roofs. (Fig. 17)



Figure 17: Old City Skyline affected by Vertical Buildings, Water Tanks and Satellite installations, Source: Oshaish (2010)

The old walled city today is a district in the city represents only 1/400 of Sana'a metropolitan urban mass. The old city is one and the smallest of 10 directorates in the city (Essa, 2010).

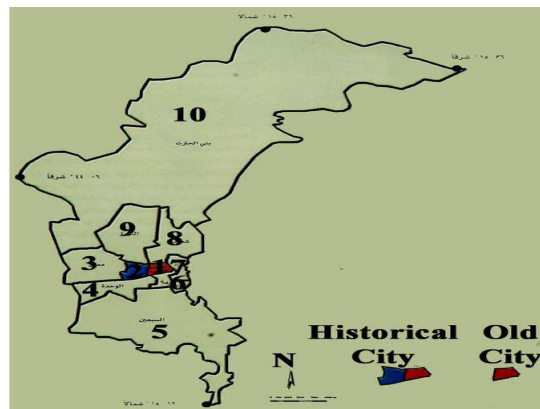


Figure 18 : Sana'a Directorates, Source: (A.E.C. 2005)

As shown in Fig. 18, the old walled city has been physically marginalized. The relationship between the old part and modern urban reality consequently is similar to the other city districts. As a result, the social and economic structure of the old city is dramatically changing, although the city is staying very much alive.

To safeguard the still existing vibrant old part of the city, a second campaign was launched by Yemen Foundation for Culture and Heritage in 2010.

## CONCLUSION

Ideally, a city should be an integrated well-balanced space, where people come to live, compete and integrate to form a homogenous urban society. The outcome is a city of solidarity forces rather than conflicting forces.

Traditionally, one of the main objectives of urban planning has been the construction of an orderly space where physical, social and political differences have to be removed in order to reach the highest level of homogeneity among the various areas in the city.

In contrast, this paper has proved that Sana'a city shares the phenomenon of urban fragmentation with the rest of third world cities.

In 50 years, the traditional gated walled city has been doubled 400 folds in size and 40 times in population. The city has undergone three fundamental phases of fragmentation. These are as follows:

- Polar phase: until 1960's, the historical walled city was a gated city by itself. The city inside the walls has proved independence, strength, originality and a sense of place uniqueness by using to full its own peculiar quality.

From 1970s a new urban organism outside the walls diffused. The new urban expansion could not tolerate any similar body. Two consecutive scenarios had happened:

- Bi-polar phase: until 1980s, the old walled city was a city competing with the modern city outside its wall. The modern city neutralized the diverse old body, removed its voice, in practice; embalmed it as a monument. Under the threats of the historical city dying, safeguarding the historical city advocated. The conserving was only the physical structures, the facades and the empty shapes. No one could have been able to prevent life from departing.
- Fragmented phase: from 1990s until now, the old walled city has been digested by the modern city. It has been flattered out and forced to express conditions of habitat and functioning leveled on those of the other city districts. The new urban form has been scattered to fragmented land use and to heterogeneous gated communities rather than homogenous communities within the old walled city gates.

The city has been imposed upon by a typical universal style of planning and ended by urban planning efforts that concentrated on short-term problem solving rather than long-term strategic planning.

As a result, Sana'a has lost its cultural and traditional "soul". It has detached from the local physical as well as the cultural contexts. As a struggling city, Sana'a is a complex mosaic where the various pieces are assembled according to logic entirely different from that of the rationale and efficient city model. The charge of inefficient fragmented form is echoed in the city's existing urban problems.

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## التحول الحضري لمدينة صنعاء : من مدينة مسورة إلى مدينة مبعثرة

خلال الخمسين السنة الماضية توسعت مدينة صنعاء خارج سورها القديم لتصبح مدنه ميتربولاتينيه. فقد اتسعت مساحة المدينة من 3.7 كيلو متر مربع داخل السور القديم في عام 1962 إلى أكثر من 1600 كيلو متر مربع في نهاية 2010.

صنعاء القديمة المسورة اليوم ( مصنفة كمدينة تراث عالمي) تعتبر أصغر مديريه في المدينة حيث تمثل فقط 400/1 من حجم الكتلة العمرانية للمدينة.

إن التحول الحضري السريع والغير منظم لمدينة صنعاء يعتبر مثلاً جيداً لتشكل ونمو وتطور كثير من مراكز المدن التاريخية في البلاد العربية.

عند ما أستعرض الششتاوي (2004) تطور المدن العربية صنف مدينة صنعاء كمدينة تأثرت بظاهرة العولمة. لكن ظاهرة العولمة ليست لها ذلك التأثير على مدينة صنعاء. فعندما تقارن مدينة صنعاء بالمدن العربية العولمة ليست هي الظاهرة العمرانية البارزة كما في مدن الإقليم في الجزيرة والخليج.

هذا البحث يطرح أن ظاهرة تبعثر الكتلة الحضرية هي الظاهرة التي تشترك بها صنعاء مع كثير من مدن المنطقة العربية. ويهدف البحث إلى المساهمة في خلفيه معرفيه للجدل القائم حول مستقبل النمو الحضري لمدينة صنعاء. واعتمدت منهجية البحث على القراءتين التاريخية ونمو الكتلة الحضرية للمدينة داخل وخارج السور. ويستعرض هذا البحث ما يلي:

- أدبيات التحولات الحضرية.

- مراحل تبعثر الكتلة الحضرية لمدينة صنعاء.

وتوصل البحث إلى تحديد أهم مشاكل الكتلة العمرانية الحضرية لمدينة صنعاء خارج وداخل السور الناجمة عن ظاهرة التبعثر الحضري.