

Big Events in Urban Life Cycle Analysis—the Case of Damascus, Syria

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Abstract—Applying the Lourenço’s meta-analysis for studying the changes in the urban planning process of Damascus city affected by the ongoing war in Syria, this analysis creates better realization of the consequences of the events over the urban planning process and actions, to help the process of decision making and new urbanism after the end of the war. The analysis will conduct scientific research using the theoretical framework of Lourenço’s meta-analysis by comparing the idealized evolution to the observed urban dynamics of Damascus for years between (1960-2015). This work will produce early awareness of any abnormality in the life cycle process, therefore better respond to the impacts of the events.

Damascus is the capital of the Syrian Arab Republic and the centre of the large metropolitan of 1.711.000 inhabitants (2009). With an area of 105 km² and density of 310/km²

Damascus has been on UNESCO’s World Heritage List since 1979, also it is a major cultural and religious center of the Levant (Eastern Mediterranean).

Index Terms—introduction, thermotical framework, Damascus city, Lourenço’s model in Damascus Case, conclusion

I. INTRODUCTION

Life cycle analysis is considered one of the modern concepts in recent times. The life cycle of urban areas is not based on mathematical equations that can deal with the assumptions and data. It is methods and tools to study urban changes and finding statistics on the development and modernization of the city’s urban study. In the case of developing countries, the life cycle analysis has massive importance since sustainability indicators are harder to estimate. In the Arab World, these indicators must consider the physical, local, and social situations that those countries have, and the lack of precise studies that can distinguish the special indicators make it more difficult to apply the methods set for more developed countries.

II. THERMOTICAL FRAMEWORK

Life cycle analysis is an applied theory to a better understanding of the changes and the process of developing the studied subject and the interaction with the time. Lourenço’s model for the study is one of the

methods for life cycle analysis. It consists of a three-dimensional graph (Fig. 1) which represents the consistency of the life cycle and the periods of the study. The time is illustrated in the horizontal axis and it is classified as each period T represents 10 years, the consistency of the life cycle is illustrated in the vertical axis and its represented by three levels; (I) for minimum level, (II) for medium level and (III) for a strong level, and this is compatible with the planning stages, it could be multiples s- curves to indicate the action and the living aside from the planning, curves present the cycle of the planning process. (Fig. 1) This model attempts to show the planning efforts, also what affects the urbanization and the public infrastructure. [1]

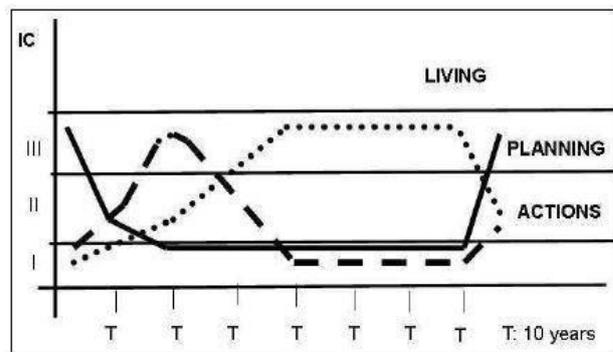


Figure 1. Ideal behaviour of a plan-process from Lourenço’s model [1]

A. The Components of Life Cycle Analysis Modally

The chosen model for the life cycle of Lourenço’s analysis the planning process on three dimensions, Planning, Actions, and Living.

The suggested ideal cycle of an urban area in Lourenço’s model lasts for 70 years from beginning with the urban **planning** of the site based of the need for establishing a new urban site or developing a new master plan for an existing one, the urban planning which is the tool to improve the society by creating more convenient space for the people living in the site, and therefore improve their lives.

This dimension starts by preparing sufficient primary studies for the site including the geographical, social physical, and many more, to conclude with the peak of the planning dimension with the establishment of the master plan for the site. The planning S-curve manifests the ration of the intensity of the planning values, including several

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regional plans, urban infrastructure studies, administrative policies and studies, structural behest, the development of those data with time in the life cycle is demonstrated as the planning S-curve. While in the **Actions** dimensions which follows the planning of the site, it measures the financial and physical productions that were allocated to establish the master plan of the site, these production actions should provide the objectives and the tracks of investments needed for the site, also it proposes solutions to the obstacle profound in the planning policies. It is recommended that the actions needed for the implementation consider the main three aspects of sustainability in order to guarantee better resilience for the upcoming urban cycle of the site. In cities urban planning the role of the public sector in the implementation provides new challenges for studying the S-curve of the action, especially with the limited access of public towards the center of implementation operations, on the other hand, the bigger the scale of the master plan, the more intense and protracted actions are needed. On the last comes the dimension of **Living**, which can be considered an indicator for the success of a master plan, as it represents the population and residence movement of the user of the urban site. These changes that are manifested in the living S-curve can be measured through the statistic of the population, migration movement, social activities, and opportunities. And as been known the main factors in developing the cities are the population and resources. The population is measured with the number of residences, their diversity in age, gender, educational level, and workforces, while the resources include the activities element in the site like mining, fishing, agriculture, trading, and many others.

What is noticeable in the ideal behavior as shown in (Fig. 1), is that the dimensions of the Lourenço's model have successive relationship between them, where each one is a follow up of the previous one where any change or effect that could impact one of them will for sure have an influence on the other two. [2] [3].

B. Pulsar Effect

This expression is a special classification of a series of events or forces that led to the need to apply changes in the process of urban planning and the city life cycle. Biased on the definition given in ISoCaRP 2002 [2], "Pulses" are the peaks troughs and recurrent or repeat events that have a distorting effect on the day-to-day operations of the contemporary city. These events may be shaped by a formal planning process or by haphazard and unpredictable forces, which put them beyond normal control mechanisms. They often demand new operational arrangements, new forms of governance, and new approaches to participation and partnership. A conceptual line must be drawn between routine jobs and recurrent special events, based on criteria of their size, periodicity, predictability, and risk. This would then enable us to define our core problem, as follows: A special events always require special management, including non-routine investments of public resources, in order to cope with the special events that are usually short-term as such but may have the potential for longer-term benefits. The

conditions of 'Pulsar effects' may lead to serious imbalances between public and private investments and their efficient and equitable use for certain periods of time and in certain areas. The challenge is to avoid such imbalances or, once they occur, to manage them in the best possible way. There is enough evidence that this can be done, but it requires very capable management. [3]

To overcome the effects of each Pulsar happening in the life cycle it is easier to study the effects on different phases. [4]. The issues of special events and their 'Pulsar effect' on urban development comprise four major phases (Fig. 2) that must be handled by good management.

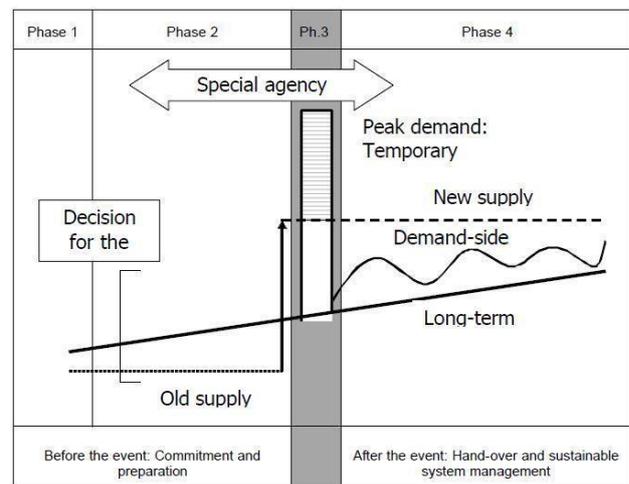


Figure 2. Supply and demand-side aspects of a 'big event' and its 'pulsar effects' [4].

- **Phase 1:** The time before and around the city's application for being a host of the big event (such as major sports competitions, exhibitions or trade fairs), and thus, its commitment to creating the required facilities in time. This phase (and the time long before the application) must include a serious capacity analysis and pre-investment studies centered on the expected demand and supply functions. Without such 'dry-runs', the preparation for the event in the short Phase 2 would hardly be sufficient.
- **Phase 2:** The preparations for the additional infrastructure and services required to host the event itself (sports arenas, e.g.) and to cope with the additional demand (hotels, housing, transport, communications, e.g.); this includes planning, financing, and implementation of all measures.
- **Phase 3:** The management of the event itself.
- **Phase 4:** The long-term management after the 'hand-over', including post-event adjustments (such as dismantling temporary buildings and winding up ad-hoc services). [4] [5]

C. Taxonomy of Pulsar Effects

Taxonomy of the pulsar effects can be built to explain the main characteristics of each event and each case based on Mesones [5] the taxonomy can show the

relationships between the event's characteristics and the effects they had on the urban area, those characteristics can range from the event's main proposed to its time and recurrence, (Fig. 3).

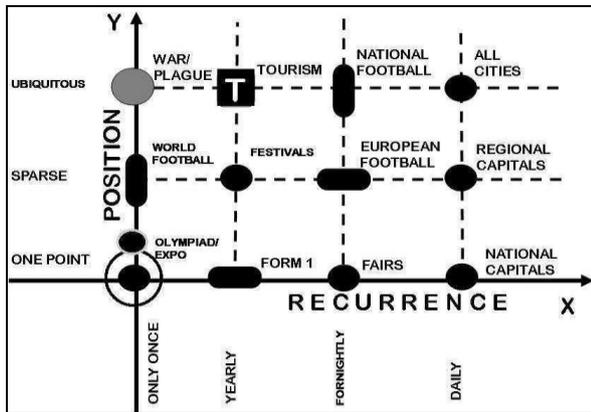


Figure 3. Taxonomy of the Pulsar Effects. [5].

The plan process behavior can change in different ways by 'pulsar effects', Expo-98 in Lisbon (Portugal) can be an example of pulsar that effected the urban plan process of the Nation's park site in Lisbon which was planned without future outlooks of the needs and demands, it was polluted with near land used for illegal waste dumping, after the planning of Expo-98 the site now has new urban design [6], the planning process was speeded up from 20 into 10 years (1990-2010) (Fig. 4).

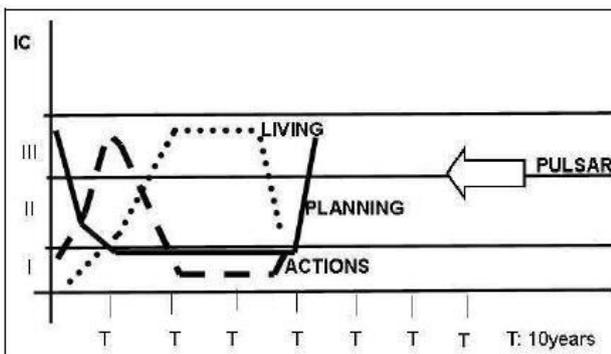


Figure 4. Behaviour of Expo-98 in Lisbon (Nation's Park Plan-Process) [6].

D. Damascus City

Damascus city is the capital of the Syrian Arab Republic, the Middle Eastern country with a population of 22,087,048 which is considered hastily growing country, the population grows from 8 million in 1972 to a current population of 22 million. Syria's population also contains different refugee communities. In 2014 there were 1.8 million refugees from Iraq, 540,000 refugees from Palestine, and Syria was home to 130,000 Armenians. However, Syria is a land that has been inhabited since ancient times. Given its strategic location firmly placed between East and West, Syria has long been the battleground site and «victim of various regional and international balances of power» [7].

Located in southwestern Syria, Damascus is the center of a large metropolitan of 3,825,235 (estimate 2004 with Damascus suburbs) [8], and in 2014 estimated to be over 5,000,000 due to the on-going war in Syria.

E. Damascus Urban Changes

The city went through many urban changes throughout its long history, it started from the city's first documented plan in the Roman era reaching the first-ever studied master plan in the twenty's century. (Danger master plan for Damascus) in 1932, under the supervisor of the French maditate the city Master plan was proposed to implementation but due to the political changes in the country the actions of these master plan had to be adjusted or altered and kept going through random changes until in 1964 with the request of the Bath Socialist Party, the French urbanist Michel Ecochard start designing new Master plan for Damascus, which is considered the most important modern vision of the city, the work took 4 years to finish until 1968, the implementing of the master plan took long time and was interrupted in 1979 when the old city of Damascus was labeled world heritage [9], most important aspect of Ecochard master plan was the redesign of the street network in Damascus, and the addition of the new areas in the surrounding districts to the administrative boards of Damascus, also Ecochard changed the commercial center of Damascus and push it more towards the further distract from the old city of Damascus, but also due to the infringement of the suburbs of Damascus the city lost enormous areas from the agricultural band that used to surround it, leading to decrease in the prosperity of the agriculture in the provinces of Damascus and its suburb. [9] [2].

In the following years, the population in Damascus increase from half a million in 1950 to 1.22 in 1985. [10]. Which led to the increased number of illegal settlements and unorganized extension of the city perimeter areas. In 1982 some political changes in Syria led to the suspension of all actions in the planning section and caused major step back for the planning process in Damascus. Increase in the number of migrations towards the capital and a high number of movements outside the country. The most common illegal settlement is in Al-Mazzah 86, which started as a military area and ended up with 125 thousand residences [2].

By 1991 the law number 10 came and opened many opportunities for investment in the city and the need to propose a new master plan by 1992. [9] a study for the new master plan was released and offered correction for the unfinished work of Ecochard master plan implementation especially in the street network, and with the help of JICA, the Japanese's agency for urban planning ten-year plan was made to implement the new plan but unfortunately it wasn't executed and remained theory vision for Damascus. In the next few years, the city experienced many urban changes like the arrival of Iraqi migration due to the war in Iraq in 2003 and changes in the economics of real estate that was enforced on the city.

In 2010, under the new changes in Syria and the opening of the market towards the investment, a study to design a new master plan for the city was the logical next step of the country and with the help of many foreigner organization the study towards the master plan started in the main public ministry of housing, but due to the beginning of the civil war in 2011, all the studies and actions towards that goal had to be stopped until an unspecified date. (Fig. 5). [2]

F. The Civil war in Syria

When the civil war started in Syria in 2011, it started in the southern provinces of the country and caused general paralysis of the social and economic movement in the affected cities, causing all kinds of chaos and disarray in the cities first then spread in the whole country. Although Damascus city center was not affected directly by the war, the damages in some areas of the suburbs reached 60%. The number of displaced people reached 2.2 million inhabitanicies in Damascus’s suburb. Many of those settled in Damascus with a 1.2 million moved into the city and settled there.

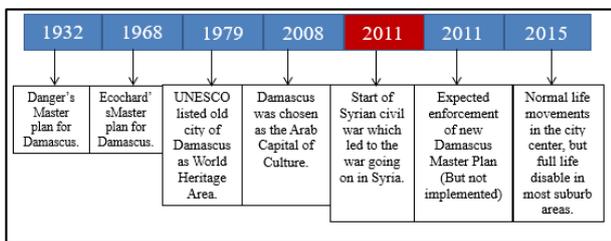


Figure 5. Urban changes in Damascus. [2]

III. LOURENÇO'S MODEL IN DAMASCUS CASE

The application of Lourenço's model in Damascus took surprising term, although the result didn't resemble any ideal behavior for an urban area, it also showed that the changes in the planning process wasn't just on the population and the living aspect only, but also the deterioration of the planning dimension of the city is clearly visible comparing to the ideal behavior that the city should have took based on Lourenço suggestion. [3]. (Figs. 6-7).

The whole three dimensions of the study were affected by the many event or effects that occurred in the city life cycle, even though they vary in the consequences of each event, especially that the country is still affected by the on-going war, but its undeniable that each of these events affected the course of the city planning process.

From (Fig. 6) the Comparison of the result of the political activity in 1982 and the civil war in 2011, it can show that while the start of the events were almost the same but the length of the event affected the results it implemented on the planning process, the city was able to overpass the effect of event in 1982, but it shows that with the given circumstances, it is difficult to pass the effect of civil war in 2011 without major changes in the planning process.

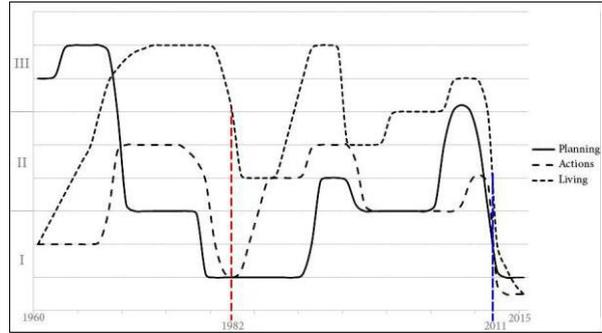


Figure 6. Damascus behaviour on the planning process 1960-2015. [2]

While in the (Fig. 7), the ideal proposed behavior of the city, it would have passed three master plans in that period if we took the golden age of Ecochard master plan as an ideal experiment to repeat in the future planning of the city, especially that when implementing Ecochard master plan, it was set for a life cycle of 20 years. [2].

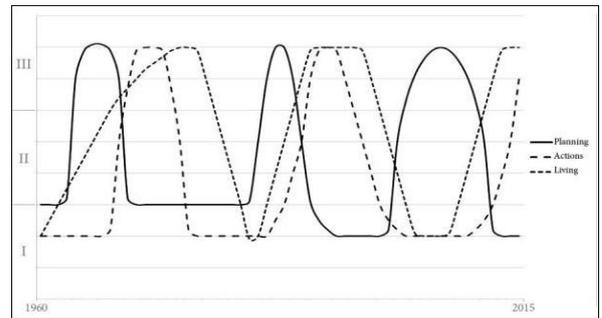


Figure 7. The Ideal behavior in Damascus 1960-2015. [2]

A. Syrian Civil War as a Pulsar Effect

Since the civil war is the major event in the Damascus planning process now and has the biggest effect over the city life cycle it would make the most sense to consider it the Pulsar effect which brought all the changes to the city and caused such changes in the life cycle.

Based on Mesones, [7] (Fig. 3), in the Taxonomy for Pulsar effect Damascus is categorized as the national capital and the Syrian civil war is a onetime event with ubiquitous effect causing changes in the country as a whole not just as localize in Damascus. (Fig. 8) [2].

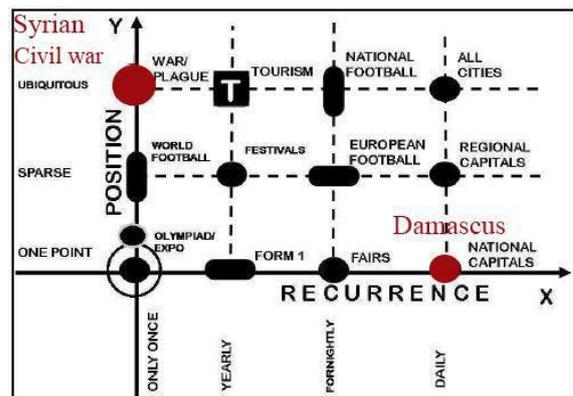


Figure 8. Mesones taxonomy of Damascus case [2]

IV. CONCLUSION

This study and the one done before this one, provide analysis of the urban changes that occurred on the city of Damascus, in addition to an application of the Lourenço's model and the influence of Pulsar effect on a very special case of study, not just because of the importance of the city as a capital of Syria, but also to the uniqueness of the event that changed the city life cycle. Many other studies applied Lourenço's model to a different area, but the scale done in this work is a first-time work.

Also, it is noticeable that the relationship of the three diminutions of the life cycle planning process analysis, is not just consecutive, but each one of those has a dominant effect over the other, it is clear the planning process starts with the planning dimension which in the other hand when reached certain phase trigger the start of the action dimension as a result of the planning idea, which indicates that no action would be able to start without completing that phase of the planning.

On the other hand, once the action dimensions reach an appropriate value for the people of the living dimension to establish the basis of a society, the changes in the living start to grow, as a derive of the planning and then action movements, without the living dimensions the other two would result in nothing.

As a result of the cycle of the living and the time passing on it, a need to start a new planning phase rise to the top, to ensure the meeting with the new requirement of the living aspect, especially after the changes in population or the technologies required for everyday activities. Then a new life cycle for the urban site is required. And that represents the dominance of the urban living dimension has over the planning one. (Fig. 9). [2]

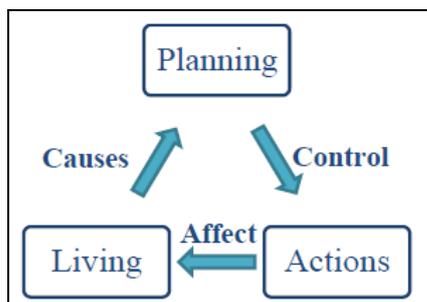


Figure 9. The relationship between the three aspects of the planning process; planning, actions, and living [2].

Many notes have been observed in this study, First. The study of Damascus's life cycle analysis, it was noticed that the data collected for Damascus urban development was insufficient with a lack of effective studies, especially after the beginning of the civil war.

Secondly, it was difficult to separate the urban planning process from the political movement occurring in the country, and the effect those movements had on the planning process was higher than any enforcement or changes in the country's history. The main reason for this is the policy of the hierarchical formation of the government in Syria, where one party is in charge of the decision making of the urban policies in the city, with the addition of the importance of Damascus as capital. Where the center of

all ministries and public intentions are located. While some other cities like Aleppo got a better chance to develop advanced master plan and more effective planning process implementation.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHOR CONTRIBUTIONS

This work has been an individual work of the Author, on the light of a previous work done as a Master dissertation.

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