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Non Conventional Methods for the Reconstruction of Destroyed Areas

إعادة إعمار المناطق المدمرة بالطرق غير التقليدية

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ملخـــص:

إن التعامل مع المناطق التي دمرتها الحروب أو الزلازل أو غيريهما من الأمور الطارئة تعد من العمليات الصعبة والمتخصصة والتي تحتاج إلى خبراء و متخصصين0 وتبنى هذه العمليات على أسس ومعايير محددة لمعالجة النسيج العمراني والمعماري والمكونات الإنشائية وذلك دون المساس بالكيان القائم المتمثل في الطابع المعماري والهوية الثقافية والكيان الاجتماعي.

ولعل الطرق التقليدية التي تم إتباعها في تعمير وتطوير المدن الأوروبية التي دمرتها الحرب العالمية الثانية أو المدن المصرية التي دمرتها حرب أكتوبر أو المدن التي دمرتها الزلازل تعد طرقا مكلفة وتستغرق الكثير من الوقت و خاصة في المناطق التي لها قيمة معمارية وتراثية لزم الحفاظ عليها ولزم العودة بها إلي ما كانت عليه قبل التدمير.

لذلك يهدف هذا البحث إلي إيجاد وسائل غير تقليدية بسيطة لعلاج المناطق المدمرة عن طريق إتباع المنهجيات التي بنيت علي التجارب السابقة والتي استهدفت العودة بالنسيج العمراني إلي ما كان عليه ومحققة لالتئامه مع النسيج الحالي بما فيه من ظروف بيئية واقتصادية واجتماعية وثقافية.

Non conventional Methods
for the Reconstruction of Destroyed Areas

1. Introduction

The reconstruction of urban areas that were destroyed by natural disasters (earthquakes, hurricanes, etc) and/or wars had received extensive efforts, trials and research worldwide. The reconstruction of many European cities that were completely destroyed after World War II such as those in Germany, Britain, France, etc, had established adequate experiences and knowledge for dealing with destroyed urban areas. Earthquakes and wars in Japan and in North American cities had necessitated major reconstruction works and accordingly modified the architectural profession in that direction. Also in the Middle East, cities such as Ismailia, Suez and Port Said had received several reconstruction efforts particularly after the 1973 War and consequently had added to the global knowledge in the area of reconstruction methodologies and techniques.

This paper attempts to explore methods for reconstruction using unconventional approaches to decrease time, money and effort. This is particularly important for the Arab World, which at present is challenged by limited time and resources while requires immediate reconstruction efforts in many Arab cities in Lebanon, Iraq and Palestine. The paper will look at the problems, challenges, constraints as well as opportunities that destruction would bring to urban areas through reviewing the literature concerning crises and disaster management and also through analyzing the experiences of Japan and Lebanon in reacting to destruction. The paper argues that the identification of the size of the problem is the first step for taking the right reaction and formulating effective plans.

2. Crises and Disasters: the Theoretical Background

Crises and disasters are two major terms for describing situations of emergencies as dealing with destructed areas, thus it gained great attention by researchers aiming to analyze such situations. Pauchant and Mitroff are two leader researchers in corporate management define crisis as "a disruption that physically affects a system as a whole and threatens its basic assumptions, its subjective sense of self, and its existential core" (cited by Alterman 2002). According to this definition, a crisis situation is linked by-at least- two conditions: Physical and Symbolic as shown in table 1 which identifies four emergency situations: incident, conflict, accident, and crises. The whole system need to be affected to the point of being *physically* disturbed in its entirety; and the basic assumptions of the members of that system need to be challenged to the point where they are forced either to realize the *faulty* foundation of these assumptions, or to develop defense mechanisms against these assumptions.

System level	**System area**	
	Subsystem	**Whole system**
Physical	**Incident**	**Accident**
Symbolic	**Conflict**	**Crisis**

Table 1: Definition of terms in crises management
Source: Pauchant and Mitroff (1992) cited by Alterman (2002)

Hermann on the other hand defines crises as "a situation that threatens high-priority for the decision-making unit, restricts the amount of time available for response before the decision is transformed and surprises the members of the decision-making unit by its occurrence" (Hermann 1972, cited in Alterman 2002). According to Bryson (1981) "a crises occurs when a system is required or expected to handle a situation for which existing resources, procedures, laws, structures, and/or mechanisms ….are inadequate".

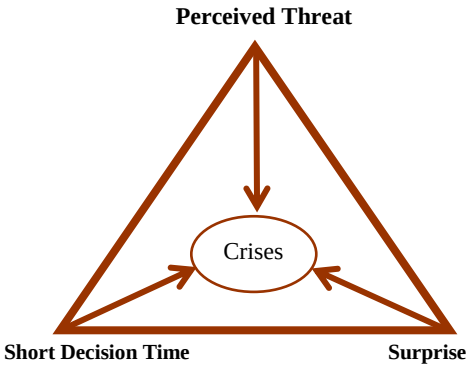


Figure 1: Elements of crises situation according to Hermann's definition.
Source: Alterman 2002

Herman's definition identifies an emergency situation as a crises: "perceived threat" to highly valued goals, severely shortened "decision time", prospecting a delay that will entail major damage and high cost, and "surprise" in a way that decision-makers are unaware that a crises situation is looming. It should be noted that this definition has differentiated between surprise and lack of planning.

3. Planning and Disaster Mitigation:

Disasters or "negative crises" should be distinguished from the concept of crisis. According to Charles Fritz, a pioneer of social science research, defines disasters as "an event, concentrated in time and space, in which a society, or a relatively self-sufficient subset of society, undergoes severe danger and incurs such losses to its members and physical appurtenances that the social structure is disrupted and the fulfillment of all or some of essential functions of the society is prevented" (Fritz 1961, cited in Steele 1996 and Alterman 2002).

It is necessary to distinguish between disasters and crises to clearly identify the perception of a great danger and loss. Disasters are also different from "positive crises" in relationships to goals and values and some operational differences. Braybrook and Lindblom (1963) classify crises as situations of high change and low understanding. This category includes not only wars but also "grand opportunities" described by table2.

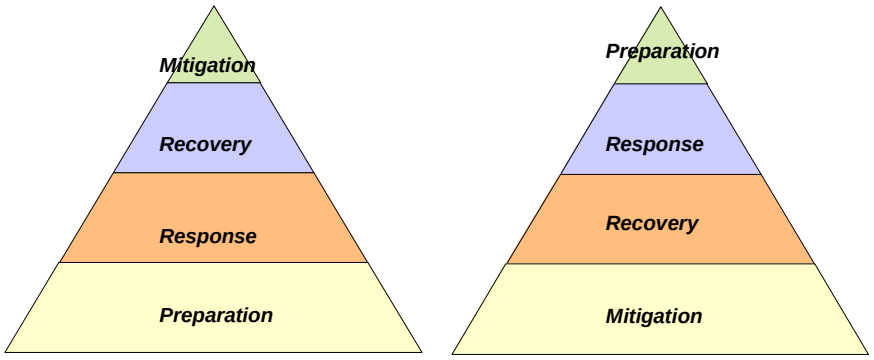
	High understanding	
Quadrant1 Some administrative and "technichal" decision-making **Analytical method:** synoptic		**Quadarant2** Revolutionary and utopian decision-making **Analytical method:**non
Incremental change		**Large change**
Quadrant3 Incremental politics **Analytical method: disjointed incrementalism (among others)**		**Quadrant4** Wars, revolutions, crises and grand opportunities **Analytical method: not formalized or well understood**
	High understanding	

Table 2

Approaches to Planning by Problem Type

Source: Braybrooke and Lindblom (1963) in Alterman 2002

Mitroff and Pearson (cited in Alterman 2002) outlined a wide-ranging set of actions that corporations should take. These actions pertain to four levels of perception and actions, as described in figure 2.



a) (b)

Figure 2: Stages of the public policy aspect of disasters (a) as noted by Steele (1996), who argues that planning ahead for disaster mitigation should take much more attention (b). Source: Kartez and Lindell in Alterman (2002)

4. Frameworks of Approaches to Planning by Problem Type:

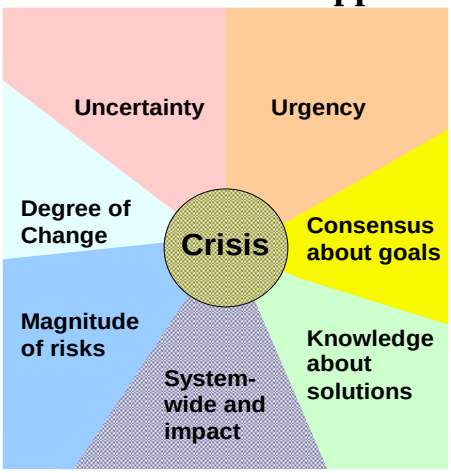


Figure 3
Attributes of crisis problems
Source: Alterman (2002)

In spite of the increasing number of empirical research on crises, researchers as Rosenthal and Kouzmin (1997) have noticed that only few concepts have been offered to date. Though, Rachelle Alterman (2002) by the analysis of the definitions of crises and major approaches to planning for crises situations had identified seven universal characteristics shown at figure3, which are: 1) uncertainty: dependence on exogenous variables, 2) degree of change, 3) magnitude of risks, 4) system-wide and complex anticipated impacts, 5) knowledge about solutions, 6) degree of consensus about goals and 7) urgency, high cost of delay. The identification and understanding of such characteristics is necessary for reacting in an effective way to crises situations particularly the destruction of urban areas.

5. Understanding Reconstruction in Damaged Areas:

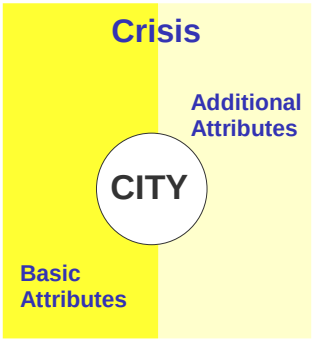


Figure4: Figure Explains the Attributes Model

The previous sections have identified the attributes, characteristics, concepts and definitions of crises problems. A model for examining the previous attributes will be used to provide a better understanding of the needs and requirements for crises mitigation. The previous concepts will be applied to case studies. The analysis and examination of the case studies revealed that additional attributes need to be incorporated to provide more effective actions. The relationship between basic attributes and the additional ones are shown in figure4

5.1 The Case of Lebanon

Seventeen years of war in Lebanon led to heavy human, material, and consequently, economic losses. Around 170 000 persons died, 800 000 were displaced, and 900 000 equal to 27 percent of the Lebanese population emigrated causing a massive brain drain. Beirut the capital, was badly damaged by the Hostility of war.

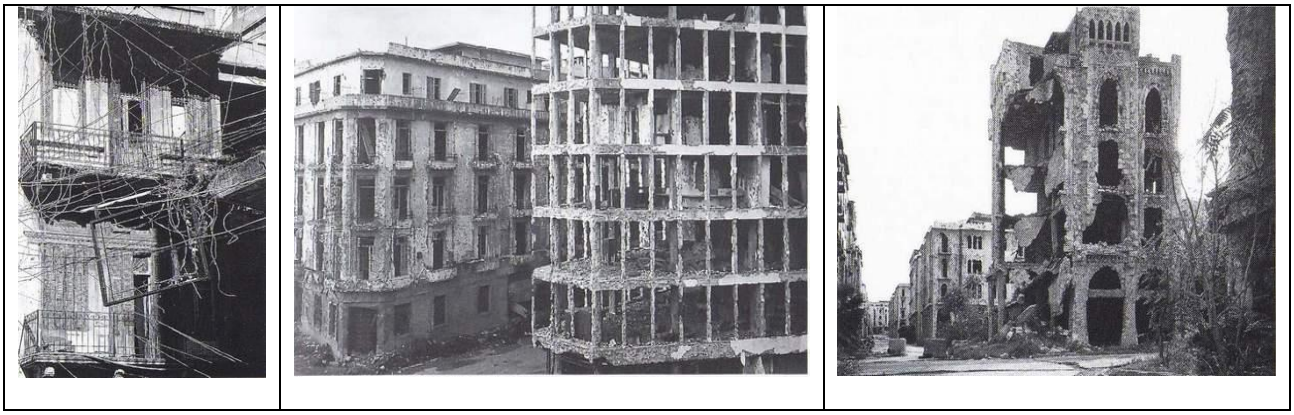


Figure5: Damaged Areas in Beirut
Source: Beirut (1998)

Two major challenges faced the plan for reconstructing the country:

- **The return of refugees to damaged villages.**
- **The deterioration of built the environment, which was replaced by chaotic urban growth.**

The Reconstruction of Beirut, the capital, has actually started during the war period and continued after the war ended. The following table illustrates the reconstruction efforts classified into the two periods.

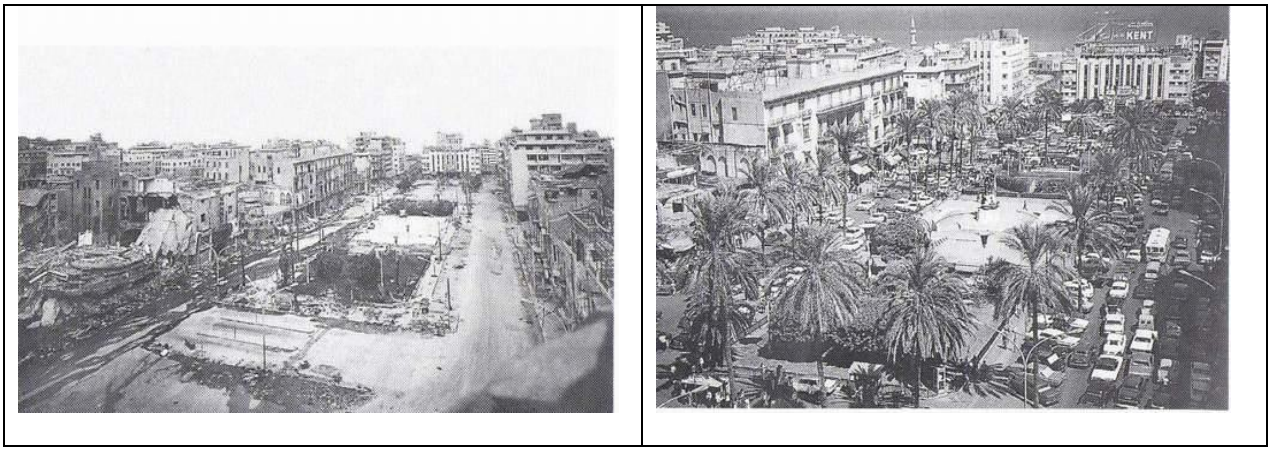


Figure6: Martyrs Square in 1981 **Martyrs Square in 1972**
Source: Beirut (1998)

Axis	During Civil War Period	Postwar Period
Area	**BCD -Beirut central district plan-** **Beirut the capital and the outskirts**	▪ **BCD Beirut central district plan by Solidere** ▪ **Southern region by Elisar** ▪ **Rehabilitation at the northern coastline**
Plan's actors	**Council for development and reconstruction (CDR) planning as a main job and construction for non-qualified agencies.**	**Municipals** **Real estate companies** **Compulsory participation of owners and occupants in the REC real estate company**
Framework	**The urban master plan for Beirut and its outskirts IAURIF plan** **a-APUR plan** **1. Maintain the urban tissue in its original condition whenever possible, and to maintain original property tenure.** **2. To encourage the legal owners and occupants of the district to return to their previous activities.** **3. To accelerate the return of the BCD to its prewar role as a platform that unifies Lebanon's multiconfessional communal structure** **4. To improve infrastructure in the BCD** **5. To revitalize badly destructed areas through establishment of real state companies** **b-the urban master plan for Beirut and the outskirts** **the IAURIF plan was reinitiated due to population drop**	**a- Real estate companies are entrusted to implement the plan of BCD by Solidere in war-damaged areas, they were entrusted to the promotion of the plan, marketing and sale of properties to individuals** **1. The role of the state was eliminated to the formulation of the companies and compensation of companies for the cost of infrastructure** **2. The compulsory association dissolves the physical boundaries of property lots to be merged into single unit to be divided into parcels and sold off to developers** **b- For Elisars plan,(area settled by squatters and inhabited by refugees), it allows temporary expropriation for urban renewal, and stipulates the return of owners and occupants to adjacent areas** **c- Linord project degraded by a large refuse dump in the sea, covering an area of around two million square meters of land reclamation using the same real estate company mechanism.**

Figure 7
The old urban fabric of the city in the fifties.
Source: Beirut (1998)

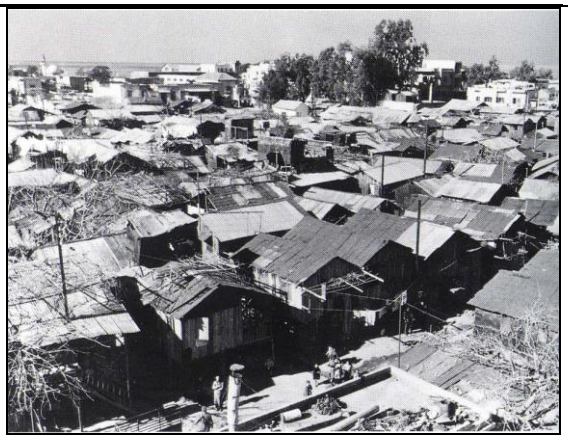


Figure 8
Squatter settlement in the Burj hammouda in 1957.
Source: Beirut (1998)

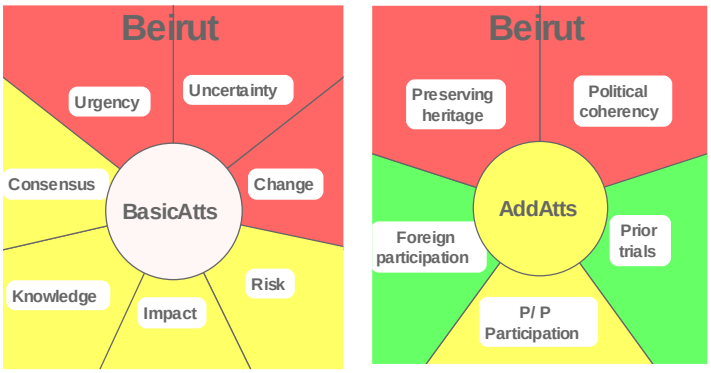
Figure9: Postwar Construction in Ras Beirut
Source: Beirut (1998)

The following table examines the reconstruction efforts in Beirut against the seven general attributes and characteristics of crises. The table shows the additional attributes emerged from the case study and could affect similar cases.

Attributes of Crises	Beirut	Additional Attributes
1. Uncertainty; dependence on exogenous variables	**Dependence on foreign grants, and foreign currency borrowing**	▪ **Political and administrative coherency.** ▪ **Community acceptance.** ▪ **Prior trials.** ▪ **Commitment to the plan.** ▪ **Response to local needs and characteristics.** ▪ **Balance between public and private sectors participation.**
2. Degree of change	**The fundamentals of Lebanon's recovery plan:** ▪ **Macroeconomic adjustment policy to reduce the fundamental imbalances + stabilize the public currency.** ▪ **Rehabilitation plan for physical, social and economic infrastructure.** ▪ **Drastic public administration reform.** ▪ **assessing the community to over come ethnical diversity (which was not considered in the plan)**	
3. Magnitude of risks	▪ **Community rejection to plans.** ▪ **Grants credit** ▪ **Loosing identity and urban segregation.**	
4. System-wide and complex anticipated impacts	**Social infrastructure-Public services- productive services-public facilities and institutions- regional facilities**	
5. Knowledge about solutions	**Plans were drawn during the war, but its implementation after war caused disorientation.**	
6. Degree of consensus about goals	**The plan suggested by planners, no public participation was performed.**	
7. Urgency; high cost to delay.	**Hostility showed:** ▪ **Depreciation at 82% percent per annum.** ▪ **Production down by at least 50% of normal levels.**	

Figure10: Schematic view of basic and additional crisis attributes for Beirut.

The figure explains major basic and additional attributes of the destruction of Beirut, weighted by colour.



5.2 The Case of Japan

At the end of World War II in 1945, Japan had a difficult task of rebuilding its destructed cities for providing the necessary housing and for rebuilding the country's economy. 115 cities were included in the reconstruction plan, with 63,153 hectares of burnt areas, 2 316 000 destroyed housing stock, 9 699 000 homeless people due to fires, and 331 000 dead.

Figure11: Tokyo in 1945
Sorce:(Sorensen, 2002)

Accordingly, Japan was faced with a unique and difficult challenge. The table shows the additional attributes that are necessary for understanding problems and identifying actions.

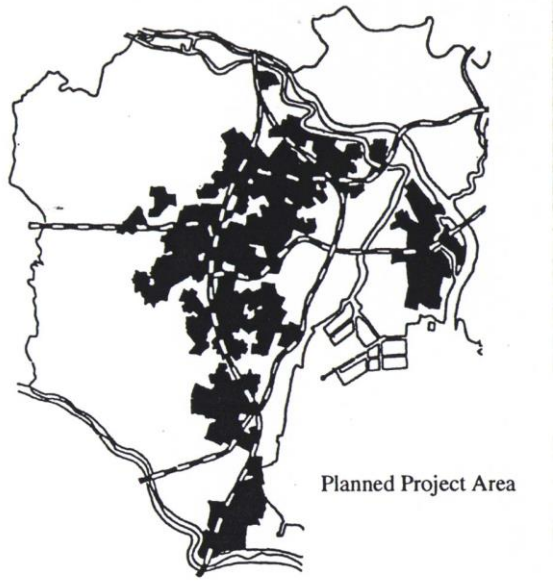


Figure12: Tokyo LR planned project.
Sorce:(Sorensen, 2002)

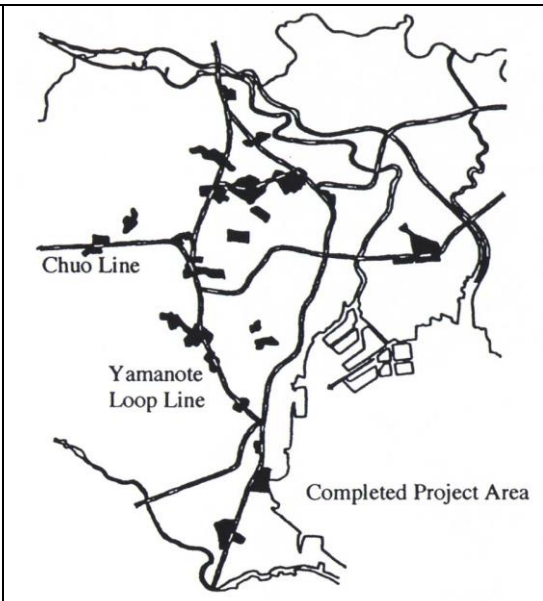
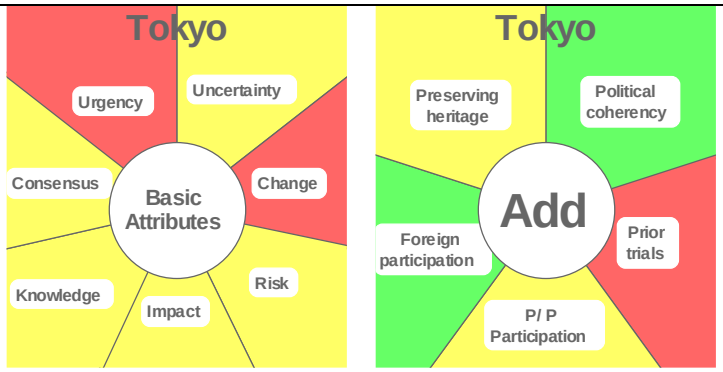


Figure13: Tokyo LR completed project wide changes happened to the plan.
Sorce:(Sorensen, 2002)

Attributes of Crises	Tokyo	Additional Attributes
1. Uncertainty; dependence on exogenous variables	There were no abnormal uncertainty source, due to self-relaiance.	▪ Foreign participation (external aids) ▪ Total losses (size of crises cost) ▪ Community's participation. ▪ Preserving country's heritage.
2. Degree of change	▪ Taking the advantage of wartime destruction to modernize Japanese urban space. ▪ Transforming the capital into an entirely new urban form with clusters of dense urban uses against a background of green space. ▪ Road widening, long standing goals for parks provision and extensive areas to be planned for existing and future development goals.	
3. Magnitude of risks	▪ Falls in central government financial support because of the pre-war economic crises. ▪ Concentration of productive capacity in a single location makes it more vulnerable to air attacks.	
4. System-wide and complex anticipated impacts	▪ Total destruction of buildings, infrastructure, activities, services. ▪ Destruction of housing stock and massive civilian evacuation for most of the city inhabitants.	
5. Knowledge about solutions	The use of land readjustment (LR) projects for urban reconstruction under the Kanto Earthquake Reconstruction law 1923.	
6. Degree of consensus about goals	Single plan was submitted with no objections, though it was modified later.	
7. Urgency; high cost to delay.	Tokyo's share of land areas in demand for reconstruction in Japan was 26.6%.	

Figure14: Schematic view of basic and additional crisis attributes for Tokyo.



Crisis Attributes	Beirut	Tokyo
Uncertainty; dependency on exogenous variables	**30**	**0**
Degree of change	**20**	**30**
Magnitude of risks	**30**	**30**
system-wide and complex anticipated impacts	**30**	**30**
Knowledge about solutions	**20**	**20**
Degree of consensus about goals	**30**	**30**
Urgency; high cost to delay	**20**	**30**

Table3: Crisis` basic attributes in a ranking system, used pane monitoring.

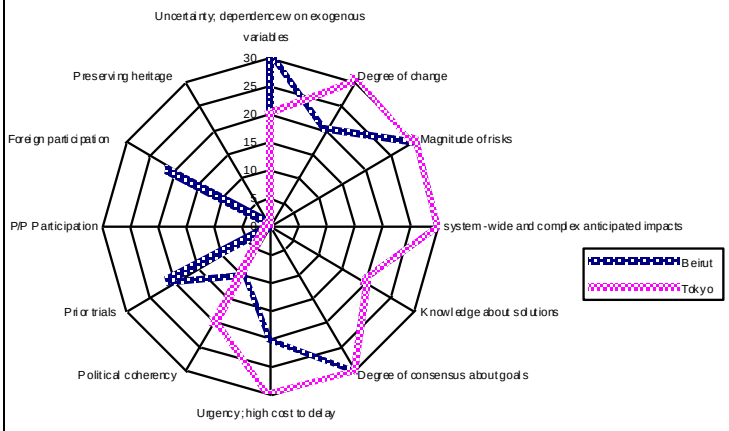


Chart 1: Chart comparing basic and additional attributes for the crises of Beirut and Tokyo. it helps to conduct better evaluation for the situation as a milestone to adequate reconstruction plan. It also helps to emphasize strategic points for mitigation response in other deferent contexts.

6. Variables of Empirical Effectiveness:

Reconstruction of damaged areas is sophisticated issue that combines all aspects of life. Comprehensive wise planning is not enough to achieve goals. Two scientists were studying empirical effectiveness of disaster planning, Kartez and Lindell, they have found that experience and crisis preparedness good practices, bears great deal of load in successful crisis management and even the most experienced crisis management authority would not be able to manage a crises without good implementation practices. The relationship of the three sets of variables are shown in figure 15.

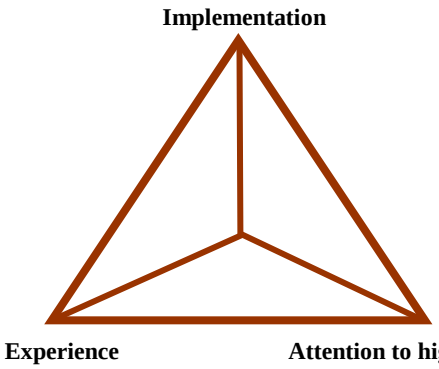


Figure 15: Variables of empirical effectiveness of disaster planning among local authorities
Source: Kartez and Lindell cited in Alterman (2002)

In order to implement planning for reconstruction of damaged areas, attention should be carefully paid to the previously emphasized mistakes of studied experiences of the two case studies. For the case of Beirut, crisis planning has treated the situation regardless to pre-existing urban fabric or even social tissue of community, more even, the hole process has turned to be a privatation process, while people suffering from war they had to afford an expensive, and inappropriate housing pattern and obsession to enable the reconstruction authority to finance the hole process. Actually, other planners had succeeded to solve both problems, a quick glance will highlight such good practices:

The Revival of The Old City of AL-Khaleel Town in Palestine:

The project has responded to the socio-economic fabric for one of the oldest cities in history. The city that suffers from the Israeli occupation that intentionally damages what ever related to original Arab inhabitants from history to infrastructure and even people. The drastic practices of the occupation authorities has led to wide evacuation to houses located in the old city, which was a reward for invaders. In an absence of a Palestinian government, a committee of citizens, historic fonded locals and some NGOs named as AL-Khaleel revival committee. The committee took the responsibility of conserving and improving about 85%

Figure 16
Sketch for a traditional abandoned house before the revival process.
Source: Center of Planning and Architectural Studies. Alam AL-Benaa [magazine]Cairo: CPAS, issue no.205 Sep.&Oct. 1998.15-17p.p. .

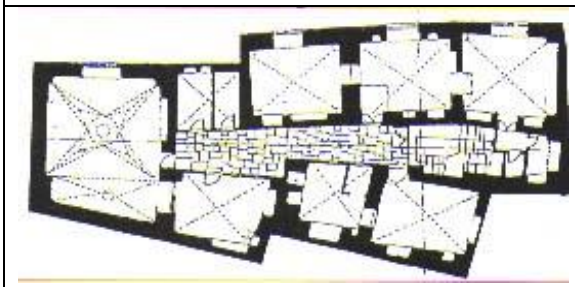


Figure 17
Sketch for the same house after the revival process shows additional stairs.
Source: Ibed.

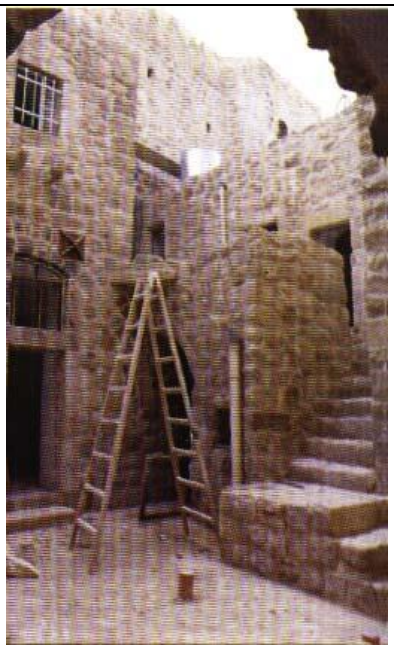


Figure 18
External space linking some traditional houses.
Source: Ibid.

abandoned historic stone houses, left to deterioration. Improvements included rehabilitation of infrastructure, and structural repairs to stairs to improve accessibility as shown in figures 16,17. Internal spaces were left to attain unity of urban fabric as shown in figure18.

To achieve required goals, the project had to come over crucial issues related to legalisations of land ownership and preservation of local-historic identity without disturbing existing social fabric and land ownership pattern of original inhabitants.

The impact of the project was amazing, stores laid in revived houses, reactivated and served as commercial poles in the old city. Another good practice of the project is the use of common local stones and materials the same tradition way of building; to revival process, which reduced cost of the project that it was Aga-Khan prize rewarded in 1998.

The use of local material using traditional construction method has served not only for residential applications but also to services buildings, as the case of a stoned-arched school in Syria- Dra`a Governorate. The rural context of the project initiated conscious design to reflect context's identity pealed by modern constructions figures19,20.

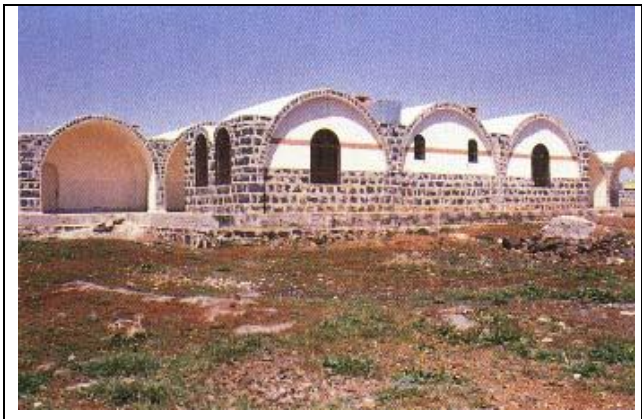


Figure 19:
Unique identity of the building in a rural Syrian context, in harmony with environment.
Source: AL-Benaa [magazine]-. Riyadh: AL-Benaa, issue no.68. Vol.12. Sep.&Oct., 1992. 83p. .

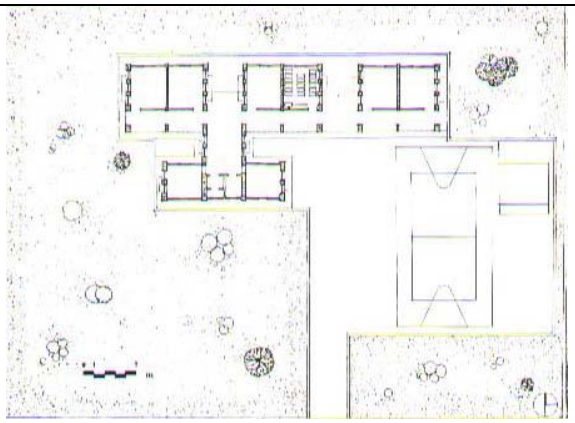


Figure 20:
General layout of the project.
Source: Ibid.

Using CAD-design systems, traditional arches systems were modified to accommodate local stones and labors skills.

Clay is another local material used to reduce construction cost and to express local urban heritage, as it did in the African development institute located in Burkina Faso figures21,22.

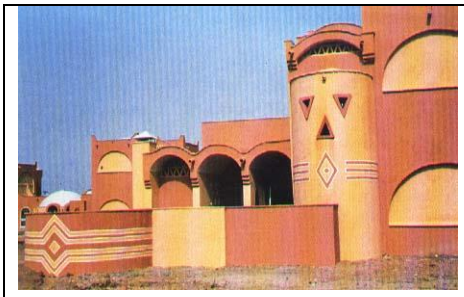


Figure 21:

The use of local architectural and graphic elements to express local identity of a project constructed from local materials.
Source: AL-Benaa [magazine]-. Riyadh: AL-Benaa, issue no.68. Vol.12. Sep.&Oct., 1992. 87p. .

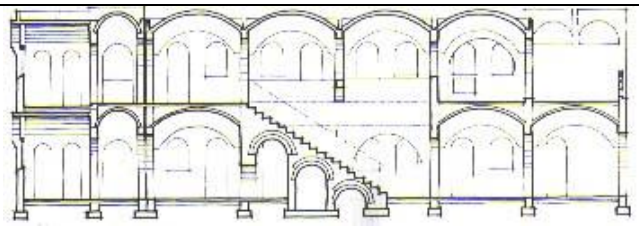


Figure 22:
Cross section illustrates structural system.
Source: Ibid

The idea emerged from the work of Hasan Fathy in using mold brick for construction and traditional architecture elements and arts.

The use of local environmental materials does not imply the traditional appearance. Modern architectural compositions can be accomplished using local building materials. The experience comes from K.S.A, where several trials held over to discover unconventional modern look using conventional local materials figures23,24.

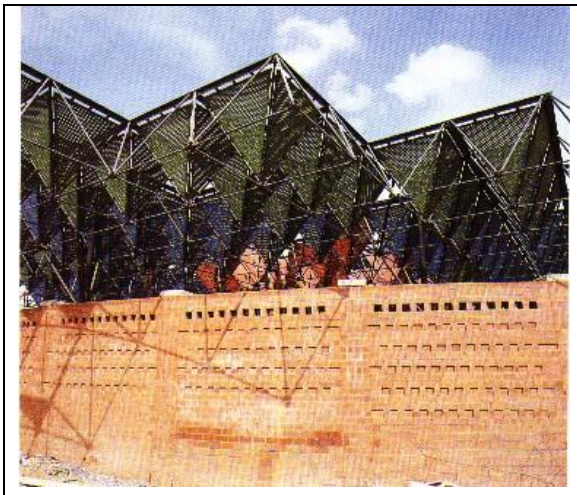


Figure 23:
Modern facade using masonry for Royal commission for Yanbu.
Source: Hassan,S.S. "building technology: masonry for building structure". AL-Benaa [magazine]-. Riyadh: AL-Benaa, issue no.27. Vol.5. Feb.& March, 1986. 87p. .

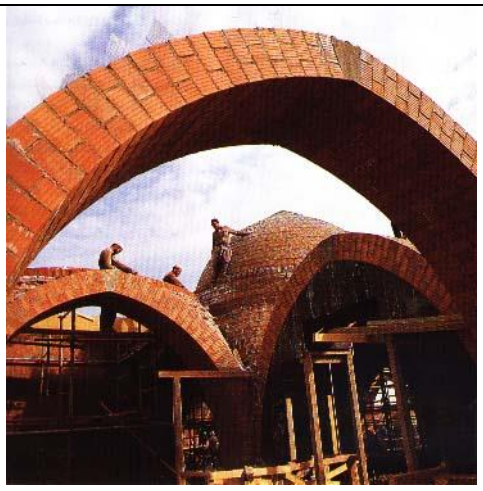


Figure 24:
Forming domes and structural system masonry.
Source: Ibid.

Conclusions:

The destruction of an urban area could be an opportunity for modernizing the area and for correcting existing urban problems. On the other hand the reconstruction process could become a merely massive building operation and thus fails to achieve the development objectives. Indeed, reconstruction must be planned within an overall development process where the human factor plays the main role in the process.

Self-financing is a very important aspect and the reliance on foreign aid should be carefully planned and should be reduced to the minimum.

The experience has proven that the success of reconstruction happens when it emerges out of the pre-destruction state heritage, social needs, environment and local variables affecting the planning approaches. The general planning approach draws the strategy and framework for reacting effectively to the crises situation.

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