Ambiguous Porosity – Integrated Urban Gaps Identification and Experimenting Urban Connectivity

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ABSTRACT: Within our urban fabric, gaps occupy a larger extent of area. Gap-ness spread in different characters and meanings, due to several factors among which are cultural, political, economical and social. Gaps are not necessary to be urban voids, its existence could be positive potential; whereas its analysis and synthesis would leads to better intervention which results in a sustainable urban fabric.

Gaps exist in the form of rupture or puncture character caused by improper social, cultural, economical or political connectivity, with respect to site specifics. The Lebanese civil war constitutes an important catalyst in the urban development process and the resultant of gap porous urban fabric. Its existence affects urban interactions and results in the formation of urban morphologies of non-potentiality for further development. The state of our knowledge doesn't show that others tackled this subject in the Lebanese context. That is why I will dwell in the issue of gaps in our urban setting. My objective is to form a systematic analytical framework, based on thematic layering, to identify the degree of porosity between urban morphologies, the permeation of the urban connective media and results in spotting gaps.

I believe to highlight on this issue, provides an essential base for future development and constitutes a sustainable urban structure.

Keywords: urban rupture and puncture, connective urban morphologies within the Lebanese context

1. INTRODUCTION

Nowadays, gaps are invading our urban fabric. Dealing with the issue of gaps in urban settlements demands an approach based on plurality rather than one based on singularity. I am interested in expanding the limits of research tackling the subject from the social, cultural, political and economical aspects.

A gap doesn’t only exist in the character of void, but also it exists in physical state, but of absence quality. Gaps are not necessary to be of negative character, but could be of positive potential that would offer better opportunity for the future. It could offer different possible opportunities for sustainable urban development.

2. GAPS UNDERSTANDING WITHIN LEBANON’S URBAN FABRIC

2.1 General Overview of Gap Issue

I believe that the issue of understanding gaps in Lebanon is a topic worthy of further research as will be shown hereafter. Understanding gaps firstly may not be achieved unless the extent of their integration is thoroughly identified, its porosity within the urban fabric. Their understanding is highly dependent on others’ research compared to the existing Lebanese situation. Researching other works helps to set a framework of analysis and synthesis. Further stage is the intervention process, applied to our urban fabric.

Lebanon was not affected by the global industrial revolution, rather was highly affected by the war circumstances. Building rules and regulations were breeched, and urban settings and morphologies developed irregularly with total ignorance to master plan. This situation, described by the municipality, lead to uncontrolled situation even lasted to our present days.

2.2 Parties Involved

Thus, it is more than clear that a radical solution is the utmost priority on the agenda of concerned parties; the government, the Ministry of the Interior, the Ministry of Public Works and the municipalities. I believe that the latter are all involved in the issue of gaps, but the municipality involvement in coordination with public involvement shorter the distance to project realization.

2.3 Importance of Gap Understanding

Understanding gaps is a thorough stage of urban fabric analysis, which leads to a vivid and prosperous urban development. What is genuine in gap-ness process of analysis, synthesis and interventions is its original relation to an urban problematic, rather to start from scratch. Gaps are the result of forces affecting development and formation of urban fabric. The definition of these forces is based on the previous researches literature,
whereas identified and analyzed through the Lebanese urban fabric based on the most convenient approach and methodology, which is always the product of several factors such as social, cultural, economical and political.

Urban gaps in itself formulates one issue in the urban fabric, but affects other indispensable issues of urban development, such as circulation network, compatibility of land-uses, morphologies of urban settlements, and others, which each aught to be a subject of study by itself.

The theoretical part of the project returns of value when applied to a case study area, “Zouk Mikael”, a typical Lebanese coastal area. Applying the study there provides a prototype to be applied in different other situations and of different site specifics which are important for the analysis process.

Gap-ness study on one hand, is an open end process of understanding analysis, synthesis, which leads to intervention phase; on the other hand it is based on a structured and systemic approach. Certainly it follows the conventional urban design terms, analysis and synthesis, but it doesn’t follow a direct sequence of interchange from one stage to another. The understanding approach constitutes a matrix, structured through analysis and synthesis of the case study area specifics, of no definite or standard sequence. Based on the urban understanding, promising interventions, design or recommendation outcomes are produced.

Many contributors and researchers to and in the subject have tackled the issue of gaps in a fragmented manner, from several points of departure and view. Therefore, I use the conventional term, gap, to relate the studied terms. It is of gap-ness quality dealt and understood in its plurality scope rather than its singularity. This gap-ness is of rupture and of puncture characteristic that is worth of study for future prevention and proper recommendations.

The intent from the phenomenal relationship of punctured and ruptured gap-ness, set an understanding framework for urban setting morphology. Researchers set typical urban clusters for design and planning, whereas I would like to expand horizons and explore morphologies affected by gap-ness.

Upon identifying urban morphologies of gap-ness character, the intervention comes depending on new criteria of assessment. This stage depends first on need fulfillment and prevention of ecological quality.

It is of necessity to study similar urban situations of gaps to base on the approach adopted. I don’t claim that I would tackle all related gap issues, but enough to set a framework of analysis along the Lebanese context, bearing in mind that the issue gaps in Lebanese urban fabric is not tackled in a similar manner as going to be proposed.

3. ABSTRACTION OF THE PLURALISTIC UNDERSTANDING OF GAPS

3.1 Gap Definition

According to Webster’s dictionary, gap is defined as follows: “a break in a barrier”, “a separation in space”, “a break in continuity”, “lack of balance”, a wide difference in character or attitude” and “a problem caused by some disparity”.

3.2 Pluralistic Understanding of Urban Gaps

Each term, related to gap-ness, explored within my literature review elaborates over an urban issue of urban, and complements the other. Gap-ness, a rupture character, is the result of a break in the continuity of urban flow. It could be a break in circulation that isolates two different urban clusters and cuts the link between urban forces: social, economical, political and cultural. Urban fabric as defined by Panerai et al. is the superimposition of urban structures that links different parts of the city. It is defined by "the culminating point of three logical systems:

- The logic of roads in their double roles of movement and distribution;
- The logic of plot subdivisions, where land holdings are built up and where private and public initiatives take place; and
- The logic of buildings that contain different activities.

I believe that gap-ness creates results in disconnectivity through the main functional aspect of the urban tissue fabrication. Panerai et al. claims that “logic” holds the urban tissue together: the logic of roads, plots and buildings.

A rupture in an urban fabric results in a puncture through a continuous urban strip. This puncture, of gap-ness character, lacks identity and meaning. Rupture occurs through different themes of urban continuity, in a linear shape such as:

- Scale
- Functionality / land-use
- Voids with respect to solid
- Building orientation

Gap-ness of puncture character occurs in the shape of a hole in urban fabric, a point shape and of the following characteristics:

a. Un-built area leftover spaces
   - no-man’s land: unstructured place
   - not programmed and not connected
b. abandoned area
c. residual areas (areas between commercial strips and districts)
d. deteriorated areas
e. undesirable urban areas
f. ill-defined (without measurable boundaries, not connected to surrounding)
g. isolated place
h. dual use places
i. non-spaces
j. places of murky situation
k. unaccepted zones of socio-economic deterioration and abandonment
l. lack of sense of place
m. wrong place (incompatibility b/w self-perception and place)

n. lack of place identity

o. waste product and lack of place

p. non-places (anthropopoological character)
   • no identity
   • no history
   • no urban relation ship

q. placelessness
   • weakening identity
   • do not create and maintain significant and diverse places

Time also affects and impacts over gap-ness existence. Gap existence is highly related to urban, of which time is the reference scale between the four urban forces and the rupture. For example an urban fabric in a certain past time, used to synchronize with its urban forces shaping it, but as time pass urban forces change while the urban fabric still stagnant, and of gap-ness character.

4. URBAN GAP ANALYSIS

4.1 Effects of Urban Gaps

Gap-ness of rupture character, the highway circulation feature, affects the urban fabric development socially, economically, politically, and culturally. It segregates the urban fabric and disorients its accessibility and functionality. Urban settlements are also reduced in areas and subjected to changes in boundaries. Social activities are affected by this rupture in the sense of an obstacle existence, which reduces face to face contact and give importance to vehicular dependence. This leads to a decrease in social interaction and provide less opportunities for engagement. Economically, people are directed to other opportunities that fits better to scale and facilities of the ruptured urban settlement. The rupture bulge out the separated urban fragment from its intended cultural activities and leaves it open to other opportunities of use. The latter patch of urban fabric is of meaningless and functionless character, and it limits the development of urban flow.

The direct effect of this rupture impacts its peripheral areas and forms a gap- puncture. The flows of economical force changes, due to the high speed circulation, and affect the usability along its periphery. The identity of place changes, and what it uses to foster as function is not anymore compatible with the developed situation. Other compatible places, functionally suitable to the highway, emerges but are not compatible with the existing, which causes abandonment of the latter and leaves a leftover space of dual function at certain circumstances. It affords a dual function since it is an undesirable place that needs re-development when proper financial or other factors are provided

Re-scaling inner circulation network to encompass the high density affects urban cluster morphology and results in the urban clusters of undefined and unstructured morphologies. The urban fabric becomes more porous of lost identity places affording people no sense of place. These gap-punctures depreciate the quality of urban fabric and create ill-formed patches. The later situation weakens the quality of social ranks’ spread. It results in isolation of social groups and ranks forming marginal places.

I believe that the urban tissue is an interconnected network held together by the urban forces: social, cultural, economical and political. The interconnected network is ruptured and punctured by gap-ness of relative porosity. Gaps fragment the urban fabric to isolated amorphous patches, and of murky quality.

My study of urban settlements explores and produces sequential generation of patches for the purpose of thorough study of gap-ness existence, structure, morphology, gap-ness and potentiality.

Rupture and puncture affects the urban patch in different criteria: scale, form, type, and others. Their understanding is directly affected by the causes resulted from the four urban forces: social, political, economical, and cultural.

The framework of analyzing gap-ness is based on a matrix of thematic layers reflecting gap-ness character and typology in relation to urban forces. This relation is compared to the anatomy of a molecule, where gap-ness is the nucleus and its factors are held by energy levels connected by bonds, which locate boundary of the patch affected by gap-ness.

4.2 The Forces Affecting Urban Gaps

The four urban forces used as criteria of analysis are illustrated as the following:

Social component:
1. Public involvement in decision making
2. Open / related morphological settings of public groups
3. Horizontal distribution of social ranks: public social ranks to have common facilities, activities, etc...
4. Integrated urban physical setting to public amenities, needs, activities, etc...
5. Fluidity of public movement
6. Shared responsibility between social parties, groups, ...
7. Development of a unique sense of place and identity
8. Making places more likeable
9. Heightening the sense of ownership
10. Counteracting urban stress
11. Improving quality of life

Cultural forces:
1. Spread of educational institutions to cover all needs of city development
2. Provision of galleries housing traditional heritage
3. Religious community needed to serve the community
4. The leisure entertainment centers accessible and affordable to the surrounding setting
5. Development of a unique sense of place and identity

Economical forces:
1. Provision of the needed commercial points.
2. Balance in the scale of commercial points: small commercial points vs. big commercial centers.
3. Ease of flow of traditional products.
4. Provision of jobs for local community.
5. Consolidating the economical stand of traditional craftsmanship.
6. Retaining property values because of a perceived better quality of life.

Political forces:
1. Governmental engagement in decision making, (municipality)
2. Government effort to implement proper prospective of sustainable development.
3. Strategies in implementation of sustainable development processes.
4. The ability to coop with contemporary criteria.

Ecological forces:
1. Add aesthetical value.
2. Integrating landscape in city needs
3. Affecting microclimate, creating wildlife habitats
4. Provision of main location for human habitation and interaction
5. Preserve natural ecology and hydrology of the site.
6. Provide amenity for new residents and retain an existing feature within a newly emerging open-space network.

5. CASE STUDY APPROACH:
5.1 General Description of Main Study Area
Zouk Mikael is subjected to several consecutive stages of development based on normal and other forced conditions. Upon the normal conditions there emerges the industrial uses, and highway construction. The first resulted in incompatible urban patches between different land-uses. The highway cuts the urban fabric to a lower and upper part. Residential functionality dominates the upper part, while the lower developed to economical and cultural functionality, due to its proximity to the highway. It used to be agricultural land, constituting an important source of living to the residents, but as the industrial electrical plant existed, farmers stopped planting due to the high pollution produced. Also residential use turned to be undesirable, and it was replaced by industrial uses, economical and cultural. This change and development within the urban fabric was highly affected by the civil war and the bad governmental monitoring. The consequences lead to major failures in urban continuity and flow of development.

The fact that the municipality is highly interested to preserve the still existing old fabric of the town, pushes further my study to explore the adopted plan of preservation with respect to urban continuity and gap existence.

Figure 1: Zouk Mikael aerial map
The patch analysis of Zouk Mikael is highly dependent on the mentioned main area specifics, which undergoes different generation of patches, illustrated in the following illustrations.

Figure 2: Zouk Mikael panorama

Figure 3: Mandate’s period patches development
Based on the area patch analysis, I decided on one for further detailed study. The approach of gap understanding applied to the spotted area constitutes the demonstrative one to be repeated over the whole area of Zouk Mikael.

Figure 4: Existing patching development
5.2 Spot Area

The spot area chosen is about 1000 x 1000 meters of urban fabric located at the entrance of Zouk Mikael, and called El Mir district. The patch boundary is defined by related lots of direct proximity to the main road or of direct benefit.

The case study spot, known by “El Mir district”, is bounded from the north by the military base, from the west by the highway, from the south by “Cat” industrial company, and from east by the upper part of Zouk Mikael. Each side of the area boundary is in fact a catalyst for gap formation. According to the Lebanese law, no construction takes place in the periphery of 40 meters around the military base and results in empty lots of murky situation, of no identity, functionality or definition. “Cat” company also results in an incompatibility of urban fabric within its residential surrounding. The upper part of Zouk Mikael presents an imbalance of urban continuity, due to absence of proper study of urban planning.

6. SPOT AREA ANALYTICAL FRAMEWORK:

6.1 General Introduction

The analytical framework is based on de-fragmentation of the urban fabric, to study its complex system of urban morphologies, structure and connectivity. The approach identifies gap-ness within the urban fabric, other than what passers by could identify from simple observation to abandoned spaces, un-built area, etc…

Lynch decomposes the urban fabric into a system of buildings interconnected by paths, edges, nodes, landmarks and boundaries. Alexander decomposes it as external and internal spaces connected by paths and reinforced by buildings (Alexander, 2000).

On one hand, my approach relies on the theoretical background, the investigation and analysis of researchers; on the other hand, the synthesis and intervention is based on my experimentation through the specifics of the Lebanese urban fabric context.

6.2 Dynamic Development

El Mir district is subject to the following stages of development:

• 1920-1940 Mandate Period

With in this period the primitive rectangular Lebanese house existed in very few places. Farmers built it in their town center and in the agricultural fields. Land lots were either owned by big families or the religious community. Farmers either rented their land or worked for land owners.

Always, there existed the coastal road, which connected the northern Lebanon to Beirut. At this stage and due to the low spread of vehicles, it encompassed low density of vehicular circulation. Trips from the north to Beirut and vise versa were scarce and only depended on necessary tasks.

Zouk Mikael was connected by pedestrian paths, small roads of low circulation density and donkey roads.

• 1940-1975 Pre-war Period

During this period, El Mir Zone fosters the concrete buildings of two or three floors. No parking area was provided within the built area. Cars are parked within the front or lateral setback, but in the case where building is below the road level, cars are parked on the street sides. Vehicular circulation along the highway increased in density and affects the roads connected to it. As mentioned before, El Mir district is situated along the main artery road of Zouk Mikael. This issue of circulation highly affects the urban fabric structure and development.

Most usability of the built area is residential. The others are commercial selling the basic needs such as vegetables, meat, etc…
The urban development follows the urban planning and design dated to early 60's. This period constitutes the transition in the main source of incomes, from producing silk to cultivating vegetable and fruit. People live in the upper part of Zouk Mikael around the old “souk” and cultivate their land in the lower part on both sides of the highway till the coast. Individuals used mules or moved from one place to another on feet.

- **1975-1995: War Period**
  During this period, urban planning and design still follows the directorate of the 60's, but breached from several extents due to the war factor, no control, no update for building rules and regulations, etc...
  The result was excess of built surface area, building within setbacks, no provisions for needed parking area, building of no future perspective, incompatibility of land-use, abandonment of urban spaces, deserting landscape, and other consequences.
  Business functionality starts invading buildings' ground floor and basements. For this fact the car parking increases in number un-proportional to the designed ones.
- **1995-2005 Post War Period**
  The municipality performed facial intervention according to no proper plan such as, planting here and there, building sidewalks with no proper studies for future development, installing lamps, and assigning public parking whenever possible.
  The municipality provides study for urban forces and its effect to future development.

6.3 Connective Analysis

The connective analysis explores the different urban interconnections based on social, economical, political and cultural factors, which are considered as forces directing the connective diagram flow. Each connective flow is represented and constituted two nodes connected together by a bond. The bond does not represent geometrical proximity, but connectivity between two internal nodes. The type of connective bonds depends on the urban forces, whereas its strength depends on its length, the strongest is the nearest. For an analogy, imagine the thermal motion of particles: the smallest particles vibrate faster, whereas larger clumps vibrate more slowly because they have inertia.

6.4 Interconnectivity of Urban Morphology

Connectivity could be either geometrical continuity, path connectivity among nodes, the exchange of persons and information, or building character identity. Buildings couple geometrically by having common walls; or they are connected via an intermediate space, which could be the building setbacks or available lots. This space could contain paths and information that tie together the buildings around it. In the spot area, "el Mir district" the media where interconnections take place are the vehicular road and building setbacks.
A pedestrian zone or plaza may or may not be a connective element, depending on whether it is heavily used or not. That, in turn, depends on how nodes are distributed around its periphery so that people need to cross the space. An abandoned, empty plaza is not a connective element any more than a parking lot is. The connective media must be designed to encourage the free interchange of users between nodes, and there must be functional reasons for this interchange. The latter issue fosters the degree of porosity, assessed by the density of interchange through the media.

7. GAP SYNTHESIS

7.1 Gap Identification

Informational interest in the façades on opposite sides of a narrow street could overcome this separation, unless car traffic inhibits pedestrians from crossing over. The car is a destroyer of pedestrian space by forcing the widening of roads, and by making patterns on building fronts and on the ground irrelevant. Often, a low-traffic road that feeds into a hard-to-reach pedestrian zone enhances instead of hindering the connectivity of urban space.

7.2 Gap Permeability

The road interconnectivity is measured by permeation, the diffusion, through a media, of a certain density of urban forces.
Permeation and porosity are two scales that measure the urban connective degree. The first measures the interchange between two connective themes within a related medium; whereas the second measures the degree of a connective theme through a medium.

Moreover the mentioned two scales highly affect the urban morphology. Its structure is illustrated by the geometrical alignment of nodes, which represents the building footprints. The function is illustrated by the connectivity of the nodes. This tends for the existence of confusion between the geometrical alignment and connectivity. Connective analysis tends to analyze the actual interaction of nodes within its related media and explores the possible existence of gaps and possible assemblage that would foster better interaction and leads to defined structure of urban fabric development.

The analysis of the vehicular permeability indicates high permeation of economical bonds with respect to the social bonds. This fact constitutes a rupture in the social interaction, an imbalance situation within the urban fabric structure. The connective analysis results in the identification that the main urban force is social. This fact leads to the study of the urban fabric morphology based on the social factor complemented by the economical, cultural and political forces, in order to build for a sustainable urban state.

8. CONCLUSION

Understanding gap as an approach applied to the Lebanon’s urban fabric constitutes a strong bases for the sustainable development of its urban fabric. It tackles urban issues from a wide scope of analysis through a matrix of successive thematic layering. The analyzed urban criteria formulate an optimistic directive recommendation for a better urban development able to foster a prosperous and vivid social, economical, cultural and economical state, knowing that there are no such studies done by the related municipalities. The understanding of urban gaps would be an indispensible phase prior to intervention, specific to Lebanon’s urban fabric after 30 years of war. Proper recommendations and interventions are always assessed with respect to the ecological layer merged to others needed and filtrated from the analyzed and synthesized matrix.

REFERENCES

[16] Source of maps and aerial photos is Zouk Mikael municipality.