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SUSTAINABLE - THE URBAN MODEL BASED ON HIGH-DENSITY, HIGH-RISE AND MULTIPLE, INTENSIVE LAND USE: THE CASE OF HONG KONG

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Abstract

China is going through one of the most dramatic social and cultural transformations in its history. In this speed change scenario, the never - questioned conventions in the western architecture have been betrayed. Invention, reinterpretation sometimes even revolution, never represent a step further as they did in the XXI century theoretical thinking.

To engage architectural thoughts with the booming economy could contribute to the definition of a contemporary Chinese architecture, far from the generic city, in a society that has evolved from pre-modernism to post-industrialism in a short period of time.

Through the analysis of Hong Kong, and a series of case studies, a conclusion to this scenario is sought.

1. A Framework

1.1 Hong Kong

This is an extremely short account of what can hardly be considered and recent Hong Kong's urban overview. In the Pearl River Estuary, Hong Kong, situated at the southeastern tip of China, is ideally positioned at the centre of the rapidly developing South East Asia (Figure 1). A borrowed city in a borrowed time, since 1997, the ex-British colony has evolved into a unique scenario integrating 100 story high rise buildings with the monsoon-influenced humid subtropical climate and its characteristic 3.050 m hill (the Victoria Peak).

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Figure 1. Geographical location of Hong Kong



Source: <<http://www.hktdc.com>>.

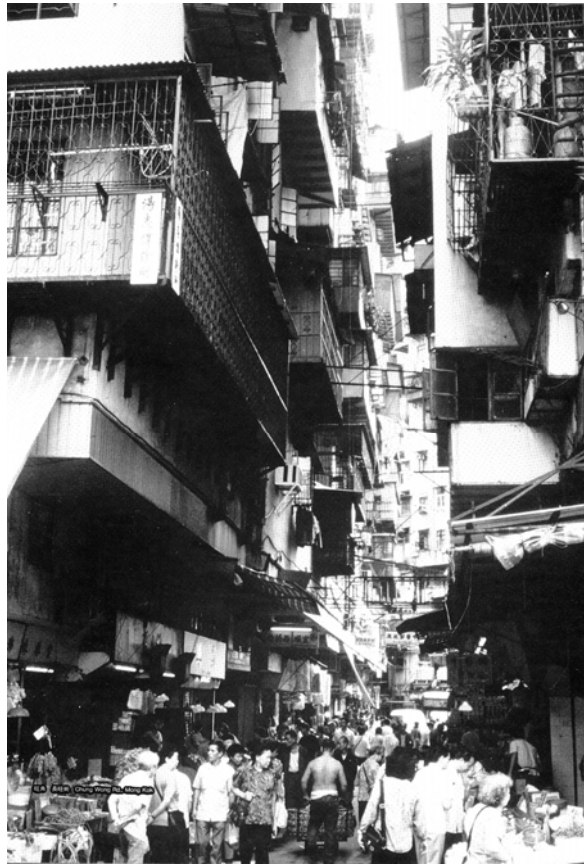
1.2 Population and density

To name some facts:

Hong Kong has a land territory of 1.075 square kilometer with a total population of more than 7M with the median age rising from 30 in 1988 to 36 in 2006 (HKSAR, 2011). The median monthly household income is HK\$15.000 (1 USD = 7,8 HKD).

A population growth rate of approximately 1 million is observed in every 10 years in the last decades. The population forecast for 2030 is 9 Million (Fung, 2001). The living density varies from 498 people per square kilometer (in most of the 232 outlying islands) to districts with over 55.000 persons, which rank among the most densely populated places in the world (Figure 2). The density of public housing reaches at least 2.000 residents/ha which is twice the density of the most crowded residential areas in Mainland China.

Figure 2. Crowded street in Mongkok, Hong Kong



Source: author.

1.3 Land Use and transport

Among the total land area of Hong Kong, the majority is reserved land like country parks or mountains. Only a 23,8% is built up areas, including 2% of reclaimed land. The built mass is concentrated in the triangular tip of Kowloon and the coastal strip of northern Hong Kong Island.

The residential panorama in Hong Kong is famous for the exorbitant prices and smallest residential units. Situations of urban decay and slum dwells create the so called cities of sadness. According to the Housing Authority and Housing Department, 49% of the population will acquire a private permanent housing, whereas only a 0,8% of the real estate developments are subsidized flats.

This unique economic scenario has evolved into a unique architecture, in which space is a precious and the high rise buildings constitute the city's main identity. In order to preserve the view of the Victoria Peak, the ridgelines, peaks and mountain backdrops, are preserved by a building free zone maintained below the ridgelines (The Metroplan guideline recommends 20% to 30% building free zone below selected sections of the main ridgeline).

Highly efficient transport systems including Ferry, MTR, KCR, LRT (in new towns), Bus, Min Bus, Tram and Taxi services are supporting a densely living style in Hong Kong. Other transportation tools such as mechanical staircase systems are also facilitating the access from the most active districts to the higher living area in the island.

Figure 3. Central–Mid-levels escalators



Source: Wikipedia.



Source: <<http://www.panoramio.com/photo/49899796>>.

The integration of mix use developments and mass transit TOD (Transport Oriented Development) is the usual strategy for most developers, saving energy, infrastructure and time. Walkability is a main issue and thus, the Hong Kong infrastructure is linked to pedestrian networks that connect up the entire Hong Kong Island, Kowloon, New Territories and Outlying Islands in close proximity (Figure 3).

This segregation of traffic and pedestrians flow is a clear improvement of the city's public space, reducing significantly the travel time.

According to Hong Kong Railway Development Strategy, six railway projects are planned for completion between 2008 and 2016. Upon their completion, 70% of Hong Kong's population and 80% of Hong Kong employment will be within walking distance from railway stations (Hong Kong Transport Bureau, 2000).

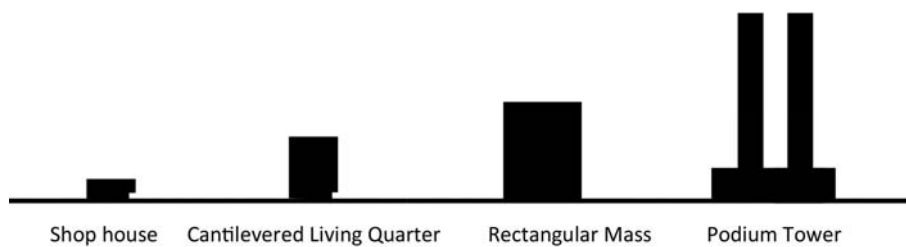
2. Urban Form and compactness: MILU

2.1 Typology

From the last Century, 4 building typologies can be distinguished in the Pearl River Delta region (Figure 4). In 1920, the Verandah Type/shop houses were the common urban solution.

Later, in the 50's and 60's Cantilevered Living Quarters Type allowed the balcony to invade the public space. Today's urban typology reflects the 1970 rectangular Mass Type and the 80's Type (HO CHAN, 1992).

Figure 4. Evolution of building typologies in Hong Kong



Source: By author.

Today, the compact city meets the demands of a rapidly increasing population and the scarcity of urban land. Hong Kong is a clear example of it, with high density rates, elevated plot ratio, mixed use developments and efficient public transport.

2.2 Multiple Intensive Land Use

The so called MILU developments are the most recent urban typology in Hong Kong. They can either be clustered around the mass transit nodes, or grow along the main roads. The clusters of MILU are spread in the built up northern tip of Hong Kong Island, South of Kowloon and other new towns. Linked by a relatively cheap and speedy transport network, they create a relation of interdependency/ complementarity among other nodes. Thus, the city functions as a system of interdependent primary, secondary and tertiary zones of MILU. The clusters integrate three

commuting levels: below ground, the mass transit rail (MTR), KCR and subways. On ground, buses, taxis, light rail transit and tramways. Finally, above ground, walkways vertically connected through ramps, stairways, elevators and escalators. A primary MILU node consists of a residential and office development served by secondary land use such as a commercial centre, a Government Institution or a Community facility.

The linear MILU takes place across streets and buildings both horizontally and vertically, and the pedestrian activity takes place at the ground level, mixing the pedestrian and vehicular flow, becoming subjected to vehicular fumes, noise and pollution. It creates an unpleasant environment for walking at street level.

The urban policy's plot ratio for commercial uses is 15 and up to 10 for residential use. These regulations have led to high-rise building typology of up to 80 floors (as an example of this, the Sunshine City, built in 1994, has 43 floors in the Sha Tin District, New Territories, or Mei Foo Sun Chuen - 1965 to 1978).

Designers in Hong Kong have taken advantage of the high density situation to generate all types and styles of mixed use design.

3. The compact city

3.1 Compact / Sprawl

The Increase of population has led to two forms of development:

- Compact urban form: High density and Mix Use
- Sprawling urban form: Low density and Mono use

What are the implications today of this urban scenario of high-rise, hyper-density and Multiple Intensive Land Use (MILU). A city with different residential densities, large capacity of public transports, podiums for commercial use, and the so called *world class* shopping malls commonly used as a recreation areas. A different understanding of the public space from the western culture.

Both forms of development lead to environmental deterioration and cause social or sustainable problems. In order to justify compactness as a suitable urban pattern for the future, the positive or negative implications must be evaluated, validated and finally, a series of appropriate planning, design and policies must be taken.

On one side, compact development causes a series of negative implications including overcrowding, lack of public space, lack of urban greenery, lack of privacy, poor quality of living environment (air pollution, noise, urban heat island effect) and etc. On the other side, the positive implications are more diverse and active urban spaces, better social interaction, high accessibility and close proximity, safety in urban spaces, efficient lifestyle and convenience, material saving and energy saving with effective use of infrastructures and reduced pollution and finally, less car dependency.

3.2 *Public space in the compact city*

Due to constrained private living spaces, people in compact cities such as Hong Kong spend most of their time in public living spaces, both indoor and outdoor. A Hong Kong resident's private life goes beyond his home into public gathering places like shopping malls, restaurants, karaoke bars, parks, open spaces known as borrowed spaces (Hughes, 1968). The most popular form of leisure among the Hong Kong population is passive recreation in planted areas and sitting out areas within neighborhoods (local open spaces) and households earning less than HK\$5,000 (US\$ 640) a month spend more than 36 hours per week on leisure activities, more than any other income group. But there are serious shortcomings in the provisions for open space (Davies, 1998).

In comparison to other densely populated Asian cities, the provision of open space in urban Hong Kong is low. Hong Kong resident has only 1.5 sq. meters per capita of public space for recreation. Singapore with similar population density and economic performance has 3 times more public space per resident. Denser Asian cities like Tokyo, Taipei all exceed Hong Kong in this regard (Xue and Manuel, 2001).

Another interesting part of open spaces in Hong Kong is that most of them are located on a podium level in order to avoid the public open spaces being affected by traffic noise and air pollution at the street level. In most cases these podiums are located within mixed use, residential or commercial developments, and thus being semi-public in nature. The distinction between private and public space is a critical issue. Most of the outdoor areas on podiums are private and controlled by security with a very fine line between what is private and what public space is. Such strategy assures privacy for the occupants but the effective usage of the public space is questionable as accessibility is sometimes very low.

3.3 *Congestion*

High density gives rise to problems like overcrowding, lack of private living space, and the fact that it lowers the quality of life. Tight private living space is the result and also a significant overuse of public open space that jeopardizes privacy (Planning Department, 2003). High-density compact cities such as Hong Kong are negatively perceived as congested, polluted and lacking in provisions of good quality urban open space and greenery (Masnavi, 2000).

4. Three Case Studies

4.1 Case Study 1: Mei Fu Shan Chuen Development

A Self-contained Township planned in 1969 for 46,245 residents or 13,068 households, this enormous development has 117 towers of 15 stories tall apartment buildings (Figure 5). This self sufficient city has shops on the ground floor and residential use on the floors above. With food markets, cinema, salon, etc., it is also connected to the public transport system (bus Terminal and MTR Station).

Figure 5. Mei Fu Shan Chuen Development



Source: Googlemaps.



Source: <http://www.hohojo.com/District/MeiFoo>

4.2 Case Study 2: Metro-City Residential Development, Tseng Kwan O

The New Town Tseng Kwun O was planned in 1997. It functions as a satellite Town, built within 3 different phases (Figure 6):

- Phase I: 6 towers for 2.048 households and 6.700 residents
- Phase II: 11 towers for 3.344 households and 13.376 residents
- Phase III: 4 towers and 1.376 households

This development follows the usual scheme of high rise towers + podium, with a Shopping Mall and a Public Transport connection such a as a bus terminal or an MTR station + upper roof that serves as an artificial ground comprising park, playground, swimming pool, club house, tennis courts etc. Covered walkways have transformed this development into a connectable town.

Figure 6. Tseung Kwan O New Town



Source: <www.wikipedia.org>.



Source: <http://hkhiso.itsc.cuhk.edu.hk/history/gallery/58>

4.3 Case Study 3: Multiple Use Development at Kowloon Station Site (Courtesy of MTR Corporation)

Kowloon Station development (Figure 7) started in 1998 with a development Schedule divided into seven development packages that included 16 residential towers containing 5.608 residential units (THE WATERFRONT, SORRENTO, THE ARCH, THE HARBOURSIDE), a 102 stories Landmark Tower accommodating 231.778 sq.m. offices, a deluxe hotel of 330 rooms and an observation deck (THE ICC), a 64-storey block accommodating 1.100 service apartment and 220 residential units, a 64-storey high quality hotel block of 1.060 rooms, a world class shopping center of 82.750 sq. meters, a 1.050 sq. meters kindergarten, a transport interchange for public buses, cross border coaches, minibuses, taxis, hotel shuttle and tour buses, more than 6.000 car parking spaces.

Figure 7. Multiple Use Development at Kowloon Station Site



Source: MTRC.



Source: <http://news.sina.com.hk/cgi-bin/nw/show.cgi/5/1/1/776215/1.html>

5. Conclusions

5.1 *Formal versus social*

The new Chinese architecture reflects a western influence. China embraces minimalism or postmodernism as the correct trend to follow. However, in China forms are being consumed as a brand type. The *good taste* (as the European modernist flavor is called) triumphs widely. The essence of ideas behind is lacking, the claim for the social concerns has disappeared (as Le Corbusier mentioned in *architecture or revolution* in 1920). What would be the opposite of this aesthetically empty architecture? A socially driven architecture, motivated by the will of changing the society and the promotion of social responsibility. This would lead to the anti-design architecture. The purely formal versus the purely social. Is there an in between status? We believe it exists a type of architecture that allows architects to make great contribution to society *through* design.

5.2 *A decorated shed as architecture*

The post euphoria architecture is about to come (Ho Chan, 1992). China's aggressive urbanization improves the economic growth, but not the living quality. Success is identified with wealth, and the city is understood as a collection of architectural trophies, a pedestal, where the citizen acquires the most exotic, expensive, unique and largest items. The consume/production machine has reached an incredible plateau for the mundane needs of the wealthy citizens. Goods are purchased at a great speed, not necessarily improving life quality but one's status/public image. The nouveau riche consume for competition. As a result the city reinforces Venturi's statement of architecture as a decorated shed, the superficial over the essential, the face- architecture, and ultimately, the big circus scenography (as featured in Fritz lang's Metropolis).

Would and economic depression inject back livability to cities? Has Spain been impacted on its livability or urban lifestyle bit since the economic crisis arrived? It has not improved yet not diminished. There is more than wealth what makes a city desirable in terms of living. In Hong Kong, public transport, public space and public housing would balance the aggressive privatized market and still inject some Mediterranean qualities in the hyper dense urban context.

5.3 *Pragmatism*

Pragmatism in china has its beginning in considering prosperity as a priority in life. The enjoyment of life is left behind, prevailing the numbers, sizes and titles. Pragmatism versus functionality. As a result, Chinese cities are filled with extravagant expensive objects. Pragmatism is related to quality in materials, finishing, technical procedures and even sustainable degrees or LEED achievements. On the other hand, the quality of the livability or vitality is low and impossible to reach when there is not a social intention behind.

The neurotic way in which Hong Kong is built and unbuilt, with spontaneous transformations that happen almost in a euphoric way, trying to make the city or the shopping mall more fun without much of a thought, is becoming sort of a guerilla or urban transformations. Nothing has essentially changed.

Wouldn't this myriad of changes be a good opportunity to finally involve the community and improve the walkways, redefine the urban planning codes (FAR, lot coverage, height limitation, setback, daylight requirements), develop new urban morphologies, allow to preserve cultural heritage and open new green pockets?

5.4 Chaos

Superficially, China may look as if it had no thoughts or structure behind its urban decisions. The reality looks incredibly complex, almost chaotic. The explanation for this is that China has a passion for flexibility and exceptions. When thinking of a grid, for instance Beijing's initial master plan, it will never be recognized it as it is in Manhattan. No perfect structures become possible since there is an open mind to eventual changes. We can only comprehend the system through approximation. Projects become intuitive then, as you will never be sure about the actual outcome of it, only about the fact that there is a thought behind.

5.5 Grain city

As in Margaret Crawford's "Everyday Urbanism", the Boom Town is nowadays a city of objects impossible to differentiate, it is seen as a generic city full of unique elements – In China, this collection is essentially the most expensive, the tallest, the widest, the brightest- Is there a real single strong urban concept behind the Chinese tier cities, for instance Nanning?

There is a lack of an alternative, a homogeneous midrise urban unit - a grain - for instance the traditional Chinese courtyard house (not falling into the nostalgia, but only thinking of the effectiveness of its spatial structure and the sustainable aspects of this typology). This urban grain, through repetition, could weave a homogeneous fabric, in which some architectural exceptions could inject character or identity in a coordinated context.

5.6 Culture

China's slow down economy would reinforce the local culture productivity, as a way forward to promote tourism (as per the western countries model) and then luckily, add identity. Transform the instant/speed/generic city. Studies reflect that culture lives longer than an expanding economy, and evolves through interdisciplinary collaborations. Architecture is now an economic engine, but shall it become a cultural tool? Beijing, Guangzhou, Shanghai, Shenzhen, are some of the potentially upcoming cultural hubs for culture.

5.7 Still Learning

China is going through one of the most dramatic social and cultural transformations in its history. In this speed change scenario, the never –questioned conventions in architecture have been misunderstood, betrayed. Invention, reinterpretation sometimes even revolution, never represent a step further as they did in the European XXI century theoretical thinking.

Figure 8. **Bird view of Hong Kong**



Source: <www.nipic.com>.

We live in uncertain times. The Chinese generic and at the same time iconic city has names: OMA, Herzog and de Meuron, Renzo Piano. Almost an attempt to mirror Frank Gehry's Bilbao Guggenheim's effect: to save a city through one building.

Architecture beyond signature names and iconic shapes (Figure 8) (the unknown architecture that looks good/does good) has a positive impact on the economic development of any urban form, especially in China, where we currently find thoughtful architecture beside mere production of constructed mass.

To engage architectural thoughts with the booming economy could contribute to the definition of contemporary Chinese architecture, in a society that has evolved from pre-modern to postindustrial. There is no definitive conclusion to the future, but to keep an architecturally open – mind as a way forward.

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