Abstract:

There is something intelligent in the geometric logic of space that is embedded in its very fabric. If this quality is recognized it can be reconstituted as an advantage and redeployed as a performative property.

Dongguan peri-urban basin in China is a mono-functional redevelopment of rural area geared toward labor intensive manufacturing, which proliferates a completely new type of landscape. This landscape consists of kilometers upon kilometers of fragmented elements i.e. interlocking low-end housing with industry assembling plants and agriculture. The inherited potential of this spatial form can be understood as a design quality for next generation of flexible urban developments. This quality, although not yet properly explained, lays dormant just beneath the everyday exterior of peri-urban areas inhabited mainly by the lowest social strata.

The loosely planned development and interlocking character of these landscapes gives rise to a unique spatial logic that is completely different from the historical zoning reasoning found in Europe and elsewhere in developed West. This logic can be explained as an Open System as described by Richard Sennett in his paper titled The Open City (Sennett 2006).

When looked at peri-urban areas closely, they reveal a staggering propensity to accommodate change and flexibility, two main qualities that the contemporary urban landscapes should contain.

Even contemporary urban design practices acknowledge the need to shift from rigid urban design of controlled urban form – disseminating contextualism, equilibrium and stagnation – to open unfinished built form. While the West is struggling to define and engineer this elusive spatial quality, the Chinese peri-urban areas have it ingrained as an intrinsic quality that enables them to survive.
1. SPATIAL INTELLIGENCE

The ability to understand urban condition is believed to be a fundamental necessity of every urbanist. The multitude of scientific texts and theories that have spawned from this belief gives one little reassurance that it is even remotely possible. Is it a problem of the theoretical discourse or a problem of the nature of the urban environment? Coming from the assumption that without the discourse there would be no informed implementation or advancements in design, one has to attribute the deficiency to the later.

Contemporary urban condition is indeed complex. It is an intricate mix of different factors – cultural, economical, historical, and spatial. As planners and urbanists alike struggle to understand contemporary urbanity, we venture into research of other disciplines, attempting to find a holistic view of the problem in hope of better results. We become experts in everything and nothing at the same time. In the over complex effort to understand others one starts to forget the primary field of urbanistic research – to understand the spatial form of the urban condition. Maybe even more importantly, we are forgetting to look into the obvious – the embedded potential of spatial, morphological organizations as such. By understanding space as geometry and understanding the underlying processes and systems that contribute to its creation we can grasp the complexity of its form without having to seek help within fields of parallel disciplines. Spatial organizations, their physical shape and presence are direct crystallizations of culture and history. We could argue that there is something intelligent in the geometrical logic of space that is embedded in its very fabric.

The problematic of spatial organizations is a complex one and is tightly linked to a specific cultural space-time framework of an explicit urban form. However, this fact does not necessarily indicate that the final spatial result that enables certain ways of inhabiting space cannot be transplanted and reused. In other words, if a quality of a spatial form can be recognized it can be reconstituted as an advantage and redeployed as a performative property of future urban form to follow.

Focusing on specific spatial conditions around the world, there is a myriad of explorations into the urban organizations of the historical European fabric [Image 1] on one hand and Metropolitan Landscapes of USA [Image 2] on the other. However, there is a fair bit of organizations that are largely overlooked. Such are the peri-urban industrial production areas of China [Image 3]. Although there was a fair amount of research done by the likes of John Friedman, Richard Sennett and Rem Koolhaas, the fact that China experienced an unprecedented growth in the last 20 years gives a large amount of material to research. Further, the spatial forms that developed under the temporal, cultural and economical pressures are so unique that a truly spatial research is indeed in order.
More in depth analysis of the fabric will show that these areas have a really endemic and unique organizational quality that enables us to question established design and planning norms. It offers a new way of how to understand material spatial organizations as such. Before venturing into the analysis of the spatial form, a definition of the peri-urban condition is needed.

2. PERI-URBAN CONDITION

Apart from new economic centers of China that permeate into a domain of metropolises, there exists another kind of reality. We are talking about places without which Chinese economical powerhouses would not be possible at all – places of intense industrial production that fuel the Chinese march toward global economy. These peri-urban landscapes are a mixture of agriculture, industry and low-end housing. We are talking about the domain of hard working people, laboring day and night in assembly and production plants. This is home to China’s strength - lower class diligent workers and farmers, the production force of new Chinese economy.

Dongguan basin is one of such production landscapes [Image 4]. These lands are a dense weave of kilometers of industrial plants mixed together with village-like housing and agricultural patches [Image 5]. As the economic standard of inhabitants is not high, the consequences ripple throughout the social and physical landscape. Scarce and degraded public spaces with only rudimentary services perpetuate ill defined open space with no apparent public centers, green spaces or proper infrastructure. A vast population of millions, that can easily rival any European city in area and density alike, is living in village-like conurbations.

This unique condition, endemic to China, has not been seen anywhere else in the developing countries. The basis for existence of these vast peri-urban landscapes is a complex mix of geographic, cultural and historical (political) reasons.
The geographical position of the Dongguan area contributes substantially to this socio-spatial condition [Image 06]. Its strategic location between the Shenzhen urban basin and agricultural rural hinterland ticks all three boxes for successful industrial production area: good infrastructural connections to Shenzhen and thus Hong Kong, cheap land for new industrial developments and abundance of cheap labor workforce from the north agrarian provinces.

The other important reason is a complex mix of history and politics.

China’s communist regime had to come up with regulations of the market and goods that would not resemble capitalism. Instead of talking about the Market Economy, the operating concept was Material Balances, where basic needs were collectively provided, thus inhibiting the role of currency as mechanism of the capitalist world. Consequentially, China had to survive without foreign investments, hence needing a high internal rate of savings. On this basis an economic and social plan titled Great Leap Forward was instituted in 1958 where “agricultural household production is collectivized under the system of people’s communes and 500 million peasants are mobilized to produce surpluses needed for investment in the new state-owned industries.” (Friedmann 2005, p. xiii)

Commune system was a social experiment that taught Chinese how to live communally, in turn creating a socialistic society. After three years the Great Leap Forward ended catastrophically in wide spread famine. State owned system was not able to support material balances. Communes were disbanded and the land went into family ownership with assigned production quotas. By 1978 it was clear that autarkic system is becoming a socialistic utopia. Deng Xiaoping implemented an Open Door Policy, as the fragile communistic system was threatened by an ever stronger global economy and capitalist forces. A necessary step of “subtle” infiltration of capitalist ideas and tapping into global markets by the communistic ecosystem was undertaken. The Open Door Policy dictated a One Country, Two Systems concept, where the majority of China (still communistic, enclosed and “self-sufficient”) benefits from Special Economic Zones (SEZ), unique areas where government dominated planning, ownership and development are replaced with public-private partnerships and capitalistic model of the West.

SEZ were a commercial success. Because of the enormous economical pressures there was no time for strategic planning. Crude industrial areas sprouted by need and necessity and housing projects were erected on a basis of necessity and prescribed architectural recipes. Through this process newly built fabric spread violently, encompassing all of the fishing and agricultural villages in the designated areas of SEZ. New landscape that was emerging was a fertile ground for a governmentally supported local group entrepreneurship called Town Village Enterprise (TVE). “Rather than passing into a private enterprise system, this encouraged the development of a local state corporatism” (Wallcott 2003, pp. 92-93) as a direct consequence of the harsh socialistic policies applied in previous decades. The TVE is an intricate mix of commune system ideals infused with capitalistic notions. It provides for local community and at the same time enables individuals to prosper. TVEs lifted individual villagers and local officials from poverty over night, giving them immense wealth and power. The TVEs operate in a gray zone between private and state ownership that well accommodates personal favors and corruption. This condition also propels the uncontrolled development of peri-urban industrialization seen in Dongguan with all of its social and economical implications mentioned above.
3. INCOMPLETE FORM

Dongguan peri-urban basin developed in 20 years from a handful of villages into sprawling tightly packed agglomeration comprising initial villages intermixed with new housing, industry and remnants of agricultural areas. Although the social and economical reality of these areas is rather grim, the pure formal and morphological organization speaks a different story. The lack of governmental control mixed with speed of development contributed to highly nonhierarchical and flexible fabric. The inherent potential of this spatial form reveals a staggering propensity to accommodate change. This peri-urban form could be seen as a personification of the Open System concept as outlined by Richard Sennett (Sennett 2006).

Sennett is defining a difference between Closed and Open System. A Closed System is an over governed environment, where half past planning ideals all champion regulation, definition and control. By ever increased complexity of cities; planners, architects and urban designers alike are trying to grasp the processes by subordinating and controlling them, resulting in homogeneity, equilibrium and integration so that nothing sticks out, challenges or transgresses the eloquently put boundaries. This in turn generates a predefined form that is enclosed, static and unable to change. This is a rough outline of cities in the Western world, where the cultural and political framework requires layers of planning regulations and rigid design frameworks, becoming formally stagnant and inflexible.

Further problem of the Western type urban organizations is a historical zoning logic which achieved its most advanced form as a byproduct of the fordism, a “relatively decentralized model of industrial order favored by Henry Ford” (Waldheim 2009, p 29). In the United States, fordism perpetuated a very specific kind of organization, where efficiency of a process was governing everything. In order to achieve the greatest efficiency of any given system, the process had to be compartmentalized and sequentially defined. This logic permeated into spatial ideas and crystallized as contemporary American Metropolitan Landscape creating completely zoned spatial organizations. In this system, in order to follow the process of production, the form is strictly defined. This in turn enhances the Sennett’s idea of the Closed System.

On the other hand, the peri-urban condition in China is very different from the outlined Closed System. The political and economical circumstances of relaxed governmental environments in SEZ that the TVEs utilized brought about completely different policies and as a consequence, a new definition of space. Scale and speed of industrialization contributed significantly as well. These political and economical ingredients enabled a development that is highly dynamic, where negotiation between different activities and programs start to happen. The rules of engagement are therefore not rigidly defined and are open to interpretation. The interpretation and negotiation is a way towards discovery and innovation, where new solutions emerge that would never come up within a previously defined Closed System. This is a concept that Sennett describes as an Open System.

The outlined concept enabled a proliferation of loosely governed fragments creating a patchwork-like spatial organization. This logic, that is free of heavy political constraints, becomes unregimented and dynamic but only to a point where each part of the system negotiates with its neighbors and defines an open whole that is constantly changing and adapting. Different organizations in space start to negotiate and become part of each other. The Open City concept (Sennett 2006) rests on the idea of the incomplete form. Here, the true value and definition of certain spatial element is not defined by itself but by its position towards the different others.

A case study of a footwear cluster in Wenzhou China (Larina 2008, pp 106-107), shows the idea of an open system and its positive spatial and social implications.
The shoe industry began to form as a concentration of family workshops, and was later formalized by a rural household manufacturing company – TVE. These workshops were clustered in neighborhoods, usually around a marketplace where enterprise managers could easily both purchase materials and then sell the products to local traders.

In Wenzhou, after an incident when a shoe factory burned down, the local government became involved with this bottom-up industry clusterization process. The government called on local companies to improve the quality of their manufacturing and improved the quality management within the companies. Further, it encouraged newcomers into the shoemaking industry. As a consequence new local shoe maker workshops developed within the industrial cluster with a “swarm type” mode of production where each independent small or medium-sized company covered a distinct individual phase of production, to be later coordinated by more or less explicit forms of co-operation.

In addition, local government actively supported service activities. For example, the government supported the establishment of a footwear design centre, set up in cooperation with an Italian business entity. Colleges and schools in Wenzhou developed professional qualifications in the shoe leather industry. Recently, the Wenzhou government began the construction of a shoe industrial park called “China Shoes Capital” [Image 7]. It has functional areas planned for shoe-making (machinery and services) and for “shoes-culture”, including a shoes cultural museum with an exhibition hall for shoe transactions and a shoes-cultural park. The Shoes Capital industrial park will enable visitors “to enjoy both new techniques of shoe-making and the traditional culture of Wenzhou as well as shopping and relaxation”. (Wang 2006)

Finally, an interactive and complex urban environment emerged that mixes industry, commercial and public functions. This environment has become a kind of public centre for the adjacent territories, firstly because it is the centre of a commercialization of production to which all neighborhood communities are related to, and secondly, because it offers a new quality of public environment and services to the village residents.

Larina’s example shows how loosely connected clusters developed as a dynamic open-ended whole, where each element contributes to a bigger system. From small shoe makers to the public spaces, schools and industry parks, all elements work within a highly dynamic environment where each fragment type is important but could be expanded, shrunked or substituted. This adaptable system proliferated a unique type of spatial organization where the intelligence of an Open System is embedded in its very material.
4. LOCAL MATERIAL INTELLIGENCE

In reflection, the peri-urban spatial organizations seem like a “holy grail” of dynamic vivid and urban environment. However, it should not be forgotten that these areas have grown without any real control and as such were not properly planned or taken care of. Further, the example of Wenzhou shoe industry is one of the more positive ones, as government was involved in the process quite extensively. Not all areas were so fortunate. In majority of cases the hunger for money and power combined with favoritism and corruption didn’t produce positive social and economical results. A list of deficiencies is rather long, for example: bad housing and living conditions as the most pertinent, others include ill defined public space, lack of tertiary sector and proper infrastructure, lack of public program and shortage of educational facilities. This stresses the importance to understand the spatial logic even more. By understanding the peri-urban condition, positive elements can be indentified and redeployed as catalysts for new urbanity. Further, by taking elements of the endemic urban form the urbanization can be driven more efficiently than imposing a regimented design strategy. Through this act, the policies of growth governing can be transplanted into design elements themselves. Additionally, if local elements are taken as primary material, they come pre-charged with the local intelligence thus increasing the chance of favorable results. In this way, positive sides of local fabric become a part of the urban strategy, and can help guide the urbanization and enhance the quality of life.

Let us look at the material intelligence and positive aspects of peri-urban area in Dongguan and identify the main spatial organizations. Further, we will try to propose a better way of how to employ them as design elements that imbed spatial policies.

By examining the fabric on different scales, the peri-urban condition offers staggering amount of nested organizational principles that can help improve future development.

4.1. SPATIAL PROXIMITIES AND ADJACENCIES

Starting with the larger scale, one of the more intriguing spatial features is proximity of different spatial organizations and their adjacent condition [Image 8]. The unplanned development and interlocking character gave rise to a unique spatial condition, mixing together dwelling, industry and agriculture. These individual parts are usually smaller than parts that constitute the Western zoned logic. That is also their comparative advantage, as proximity of different sectors has multitude of benefits. Form becomes more sustainable as diversification into different sectors brings less dependency on one mode of economical production. If we couple this with the embedded flexibility, spatial proximity of different production sectors can be understood as very dense and varied space. This is a characteristic of space that is most commonly referred to as urban.

In the Western historical fabric urbanity is derived from close proximity of tertiary sector elements, here, maybe proximity of elements of primary and secondary sectors can create this complexity. Can therefore this fabric be called urban? Perhaps this form represents a new type of urban experience and a new type of urbanity all together. Problem that arises is that relation of tertiary elements in the city “compacts” the space more efficiently than the primary and secondary sectors ever can. This is due to the fact that the tertiary sector elements (bank, post office, church, shop, cinema, etc.) are not so space demanding,
hence generating a lot of activity on a very limited area, in turn, creating 'urbanity', nodality, hierarchy… In addition, industry and agriculture as production sectors require big areas to operate, consequentially, planning of such areas remains on the large scale. As a result, the in-between spaces – stitches between these areas – stay unresolved. These are the spaces that are the most hybrid, varied and mixed, that spawn hierarchy and differentiation. Similar spaces in the city environment take a prominent role as generators of public, urban space, but in the peri-urban condition are overlooked, largely because of the scale at which these areas operate.

To create a better structured and denser peri-urban environment, it should be constituted and defined more like a city environment. Important parts of the peri-urban fabric should be resolved on a smaller scale with finer detail. By identifying the processes and elements within the primary and secondary sectors [Image 9], that could be taken out of these areas and reconstituted into tighter spatial relation as densification nodes, a new kind of urbanity is constituted where industrial and agricultural processes that are spatially undemanding start to generate dense experience, nodality and differentiation.

4.2. PRODUCTION DWELLING SEPARATION

In parallel to the patch-work adjacent condition, there is a strong separation into industrial areas and dwelling areas. Industry accumulates as corridors along new infrastructural grids. Dwelling ecology develops in between the industrial production areas. Existing villages act as seeds to form new housing developments. These in turn grow toward the new infrastructural grids. The two different systems described negotiate in space and time and are in constant flux [Image 10].

The more rigid Regional Corridor [Image 11] accounts for freight transport and regional connections. It accumulates mainly production - industries, sometimes also linear mid-end housing. Elements are bigger and clustered.

The fluid and amorphous Local Corridor [Image 11] accounts for all the non-production activities and dwelling. This, loosely connected configuration could be seen as a local public and urban system where all daily facets of everyday life take place. Elements are organized sequentially along the corridor.

Sadly, the negotiation between the built corridors happens at the expense of the agricultural land and agricultural production. Its low economical
productivity is not making it viable in this highly motivated race for space. By recognizing the competitive advantages that agriculture brings (e.g. intensification through hydroponics, creation of new public open spaces mixed with agricultural production) we can reintroduce it back into the negotiation process [Image 15]. This could be seen as a design element embedded with a policy that brings about creation of new urban environment to enhance the quality of life.

When corridors meet or intersect they tend to develop new spatial organizations [image 12] that are morphologically an assemblage of both corridors. This spatial condition, and the fact that production and dwelling meet, accounts for rudimentary services in form of local markets and shops, something similar to what was described in the Wenzhou case study. These are programmatic densifications that could be understood to act as catalysts that enable mixing and connection of the two very different conditions. In the light of new design practice, these mixing nodes can be used as drivers to dictate new corridors and their differentiation [Image 13]. Furthermore, these they could be used as nodal elements through which both systems could be controlled simultaneously. In this way a mixing condition designed as a node can be redeployed as a growth control mechanism of new urban fabric – a policy that takes into account current trends of growth, evaluates them and redeploy them in a refined form.

4.3. INTERMEDIARY PARTS

Looking into material organizations of local corridors more closely, they reveal a loosely connected ecology comprised of different parts. More distinct elements are: old villages, new “checker” low-end housing, allotments, fish farms and rice paddies. The ecology has a strong directionality. The continuity has moments of intermittence where different parts of ecology come together. Elements of intermittence work as intermediary parts [Image 14] that enable the ecology to connect different segments. There is an infrastructural spine that is loosely stitching the ecology together. If this infrastructure is enhanced, it can function as local infrastructural network that supports local public activity.
The intermediary parts can sometimes be poorly defined - they become a residue space of urbanization, vague unoccupied areas. In very rare cases they develop as rudimentary tertiary sector (primary school). So far these intermediate elements bring together similar fabric (one low-end housing and the other). They have an embedded quality of publicness therefore they could act very well as mediatory transitional spaces that enable to confront different social classes and spatial organizations [Image 15].

These public spaces could be understood as machines that normalize society, something similar to Central Park in New York but on a smaller scale.

Central Park provided a “common ground” for people of different customs and social backgrounds to meet and learn to live with one another, thus enabling the individuals to normalize (and aggregate) into a productive society. It provided a place where “antebellum elites could mingle with immigrants to the city away from the frightening confusion, strangeness, and uncertainty of densely packed streets.” (Rowe, 1997, p. 154)

4.4. CLUSTER ORGANIZATIONS

Inspecting the regional corridor in more depth, it is composed of adjacent clusters – enclosed organizations of different parts [Image 16]. Clusters are interesting structures as they bring together different parts and organize them around common open space. This is creating a dense, varied and above all highly adaptable organization that can accommodate change easily. When thinking back to the idea of new urbanity, clusters could be reused as organizational principle [Image 18] for the new mixing nodes because of their compact size, grain and adaptability.

Reusing industrial clusters means reusing the organizational principles and not the program. New clusters have to resolve the permeability and disconnection issues, to be able to create more varied organizations. Current cluster organizations do not engage the surrounding fabric and work as individual cells, resulting in the grid intermittence. By changing the permeability of clusters and their orientation, the disconnected network could be reconnected and better organization of areas could be envisioned. The permeability would enable much more varied and adaptable environment where parts of different production sectors create ‘urban environment’ together with housing and services [Image 17].
6. CONCLUSION

Peri-urban production oriented areas like Dongguan are areas of lower social strata – workers and farmers. Although these areas have their disadvantages with respect to social conditions, the fabric's ability to accommodate change and its character offers plenty of potential.

Unique way that different spatial fragments cohabit and negotiate in space creates a flexible and dynamic urban form, an Open System that is very sustainable as it accommodates change much better than the Western planned and zoned fabric.

With minute changes in the way these spatial configurations are understood new set of policies that are embedded in the design of critical fragments [Image 18] can turn area’s disadvantage into an unprecedented opportunity. The inherent character of the area that manifests itself in the never finished, interlocking character of spatial parts is a great starting point to drive the urbanization into a more sustainable direction.

Form methodological point of view; this fabric can be seen as a new way of how to approach urban design and urban planning. Since every contingency cannot be predicted through policies, it is a better solution to devise a planning and design mechanism that can be flexible and even more importantly, that can accommodate difference and change. Only through difference negotiation happens and brings about new revelations. Controlled policed space will never be able to do that – it will always be a predefined concept that is stagnant.
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9. IMAGE CREDITS


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