Kombe, W. (2011). "The Cost of Urbanisation in Tanzania." Paper presented at the expert workshop in 10th August 2011, Dar es Salaam.

Kombe, W. J., & Kreibich, V. (2006). The Governance of Informal Urbanisation in Tanzania. Dar es Salaam: Mkuki na Nyota Pulishers.

Lupala, J. (2013). Paper presented at the Annual Conference of the Tanzanian Association of Planners, Dar es Salaam.

Mabogunje, A. L. (1992). Perspective on urban land and urban management policies in sub-Saharan Africa. Washington DC: The World Bank.

Mollel, L. L., & Lugoe, F. N. (2007). Urban specific land-use conflicts and their effect on land management, good governance and the environment, Dar es Salaam. Dar es Salaam: Institute of Land Administration and Policy Studies DILAPS.

Njoh, A. J. (1999). Urban planning, housing and spatial structures in Sub-Saharan Africa: Nature, impact and development implications of exogenous forces. Aldershot: Ashgate.

Payne, G. (2001). The impacts of regulation on the livelihood of the poor. Paper prepared by for the ITDG research project: Regulatory guidelines for urban upgrading.

Rondinelli, D. A. (1973). Urban Planning as Policy Analysis: Management of Urban Change. Journal of American Institute of Planners, 39(1), 13-22.

Roy, A. (2009). Why India cannot plan its cities: Informality, Insurgence and the Idiom of Urbanization. Planning Theory, 8(1), 76-87. doi:10.1177/1473095208099299

Scholz, W., Shedrack, J., Dayaram, T., & Robinson, P. (2013). The Influence of Planning Standards on the Long Term Suitability of Settlements: Evidence from Dar es Salaam. In Colman, J., & Gossop, C. (Eds.), Frontiers of Planning: Visionary Futures for Human Settlements (pp. 28-45). UK: ISOCARP Review.

Scholz, W., Baumgart, S., & Hossain, S. (2015). Translation of urban planning models: Planning principles, procedural elements and institutional settings. Habitat International, 48, 140-148. doi: 10.1016/j.habitatint.2015.03.006

Selle, K. (1995). Phasen oder Stufen? Fortgesetzte Anmerkungen zum Wandel des Planungsverständnisses. RaumPlanung, 71, 237-242

Watson, V. (2003). Conflicting rationalities: implications for planning theory and ethics. Planning Theory & Practice, 4(4), 395-407. doi:10.1080/1464935032000146318

Watson, V. (2009). Seeing from the south: Refocusing Urban Planning on the Globe's Central Urban Issues. Urban Studies, 46(11), 2259-2257.

Watson, V., & Agbola, B. (2013). Who will plan African Cities? London: Africa Research Institute.

ID 1419 | DEVELOPING AN ANALYSIS FRAMEWORK OF URBAN MORPHOLOGY STUDY

Wei Xuanzi[1]
[1]TU Delft
x.wei-3@tudelft.nl

1 INTRODUCTION

Urban morphology is the study of the city as human habitat (Whitehand, 2007). Its study is characterized by diverse perspectives. The primary concern of urban morphology is urban form. The spatial layout is the realistic dimension of urban form, and is the tangible results of the social and economic transformation. To understand how the urban form overlap and fit into each other is of crucial importance (Whitehand, 2007). Thus how to deconstruct the urban form into the elements and to explore the relationships between the elements will serve to understand the mosaic of urban form.

Kropf (2005) deemed that generic structure of urban form is a hierarchy of levels related part to whole, which means the urban form has different levels. As Mudon (1997) has pointed out: urban form can be understood at different levels of resolution, commonly corresponding to the building/lot, the street/block, the city and the region. Whitehand (2007) also think the resolution is one of the three components that

constitute urban morphology. Wang and Zhou (2014) divided the urban space into 5 levels of resolution: building, the street, the block, the city and the region, and reckoned that the conception of urban morphology itself contains the relevance and unity of different spatial scales.

The realistic built environment has offered a direct image to reflect the transformations of urban morphology of different levels. At finer levels, large squares, the high-rise buildings has replaced flat houses and courtyards; at relatively high resolution, the newly built-up areas began to emerge, the wider road network for the vehicles has replaced the pedestrian-friendly network; the overpasses and highways which function as a conjunction across the areas or even municipalities can be seen as an intuitive symbol of the integration of the areas into a region, though the overpasses and highways are not necessarily built to help the definite formation of the region. Thus when different scales are concerned, different kinds of transformation in terms of urban morphology should be concerned, as Kropf (2005) pointed out, individual buildings, at one level of scale, do not have the same handling characteristics as a street, at another, or a town as a whole. However, an analytical framework at different levels of urban morphology has not been established yet.

Therefore, this article will commit to develop an analytical framework for the urban morphological study. This framework is established on 3 levels: neighbourhood level, town level and metropolitan region level. The building level is avoided since the building mainly focuses on the architectural characteristic if it is regarded as an individual level, while this framework is an analytical framework for the urban morphology, in which the building could only be regarded as an element at neighbourhood level. The street and block levels are substituted by the neighbourhood level since the block layout is mainly decided by the street network, which means these two are essentially the same, and within one neighbourhood, the block, street usually have certain unitary characteristics, thus should be categorised into one level.

This article is going to answer the questions: how the analytical framework could be established at the neighbourhood, town and metropolitan region level? What are the different focuses at different levels? what are the elements of the different levels, and what are the relationships between the elements? How could the different elements been synthesised into a unified framework?

2 NEIGHBOURHOOD LEVEL

2.1 CONZEN'S THOUGHT

Conzen tried to interpret the development of the urban form from a historical perspective. He thought the city emerged as a result of complex processes - primarily economic, social and political, while the rules and regularities between these processes and the form of a city can be noted in the development of its physical structure (Niković1 et al., 2014). He has developed a tripartite division of the townscape: the town plan, the building fabric and land utilization (three form complex), they have overlapped, integrated and evolved into the current form.

The land use pattern is the order or spatial development of land use, the elements of this pattern are the individual units of land utilization reflected on discrete plots, the elements of the building fabric is defined as the individual buildings. The town plan is subdivided into three components: the street system, plot pattern and building pattern. The constituent element of the street-system is the street; the element of the plot pattern is the plot and the element of the building pattern is the block-plan of buildings (Kropf, 2009). The plan unit is defined by distinguishing it from its surroundings in terms of its streets, plots and buildings. And the morphological region (landscape unit) is further defined as a region that has a unity characteristic in respect of urban form (characterised by three form complexes). The morphological region serves as the basic unit to illuminate the historical development of an urban area in urban morphology.

The layout of the street system dictates the block system, and the street-block is an aggregate of plots, is a plot or group of contiguous plots bonded partly or wholly by street-lines and forming a discrete part of plot pattern of the town (Comert, 2013). The plot is identified as a unit of land utilization and the building is individual units of land utilization occupying discrete plots. Therefore, the elements of this method is not independent, one does not make sense without another.

2.2 CANIGGIA'S THOUGHT

The Italian thought of urban morphology is developed by Muratori in 1940s, subsequently developed by Caniggia, they also think the city could only be understood from a historical perspective, but they deem that the building typology should be the starting point of the study of urban morphology.

This method analysed the urban morphology as a complex entity split into a hierarchy of different components: elements, structures of elements, systems of structures, and organisms of systems. There is

an interdependent relationship within the hierarchy system. For instance, the individual buildings are related with each other, so do they with their lots. Caniggia applies this to both individual buildings and to the town. When considering the town, the buildings are elements. The structure of elements is an association of buildings or an aggregate which referred to as a tissue. The system of structures is then a combination of tissues forming districts and neighbourhoods. When these are taken together, they formed the settlement of towns. Then all of these get unified and formed as the organism of the town and cities. Urban morphological process could be understood through a typological process, namely, the process of continuous evolution of type over time in an area (Chen, 2010).

With this method, an object of a scale is all objects with a relation of whole to part to objects of the scale immediately smaller (Comert, 2013), which means the urban morphology of a town could only be explained from the buildings. The aggregation of the buildings is urban tissue, Caniggia defined it as the coexistence of several buildings existing in the minds of builders before the act of buildings. Thus, the construction of the architecture and the town reflect the relationship between the different entities in a certain cultural era. In the urban tissue, the lot, route, block could be identified, all characterised with a type nature, and is related to its surroundings at equal/upper/lower scale. The system of structures is then a combination of tissues forming regions or districts, which taken together form the organism of the town (Kropf, 2009).

2.3 PEREIRA'S THOUGHT

Unlike the former two methods focusing on the traditional historical cities, Pereira's focus is on the newly-built urban space. New urban space production features new urban areas being built from scratch and urban regeneration. This urban development process may lead to a careful formalisation of urban space in the building area, creating a vacuum in the borders between buildings, abandoning continuous and subsequent spaces during multiple interventions (Pereira, n.d.). The newly-built area has reduced the town into an urban area which is a juxtaposition of architectural objects, lacking an urban expression to form an urban style.

The form of the town is established in the relation between the outdoors space and buildings, which exist in a given landscape/soil (Pereira, n.d.). Pereira identified the elements of urban form into landscape/soil network, outdoors space network and buildings network, and each network is not independent, instead it is the interaction of the networks that shapes the urban form and dictates the expression of the city.

The landscape/soil set the context of the newly-built. The influence of landscape/soil in morphologic terms mainly concerns location, topography, sun and wind exposure, and soil and subsoil quality and aptitude and landscape composition. When prepare for the new development, the context need to be taken into consideration in terms of building the new order, the context could have already set the limits of the building activity, and identifying the transformations would help to build the compatibility between the future form and the current form.

The outdoor space was analysed into two categories: circulation space and outdoors meeting space. Circulation space is the moving space for the vehicles and pedestrians, it is the network that connects the settlements and other urban areas. It is constituted of a hierarchy system with different access opportunity to the people and other urban spaces connected. It points towards a relationship between the road network, outdoors meeting spaces and buildings in terms of formal and functional integration and spatial distribution of use or omits it, which indicates how this relationship is viewed and defines the dimensions and geometry of the building network (Pereira, n.d.); The outdoors meeting space morphology is delimited by the cultural and functional aspects, and is related to the definition of urban space production in a certain society. The morphological nature of the outdoor meeting space is usually omitted and narrowed into some green space and built outside the urban settlement, which, gradually swallowed by the growing of the settlement. Thus the outdoors meeting space is usually fragmented, cannot comprise a network, do not take the role as a regulator for the building outlines, hence the vertical urban form (Pereira, n.d.).

The buildings are the main element in the outdoors space's vertical component (Pereira, n.d.). The buildings are established as a consequence of the formal definition of the urban outdoors space, or its inducer (Pereira, n.d.). If the buildings act as the inducer of the outdoor space (a prevailing point), the outdoor space is the dependent variable of the buildings, which means the buildings will have more intervention to the outdoor space. While on the contrary, the exterior form of the buildings corresponds to the interpretation of the already established urban outdoors space's form on a planning level and is interpreted by designers when drawing building façades for the decided activities by the programmes (Pereira, n.d.).

3 TOWN LEVEL

3.1 LYNCH'S THOUGHT

Lynch's research on the city is based on a pragmatic psychological perspective, he focuses on how the city's image is cognised by people, namely the imageability of a city. He defines imageability as the quality of physical object which offers the observer a high probability of evoking a strong image, and aims to see how the urban physical environment could be manipulated to the imageability's advantage.

An environmental image could be analysed into three components: identity, structure, and meaning (Lynch, 1960). Identity means the individuality or oneness of the object, by which it could be recognized as a separable entity. Then the structure means the spatial or pattern relation of the object to the observer and to other objects, the object should have some practical or emotional meaning for the observer (Lynch, 1960). The three characteristics make the image workable. Considering the inconsistency and diversity of the meaning for different minds, it is wiser to focus on the physical clarity of the image (identity and structure) and to neglect the meaning respect. Based on the mental maps from different individuals of three main cities, he found the imageability of a physical urban form highly depends on the five elements: paths, edges, districts, nodes and landmarks.

The type of the elements of a certain physical entity is not set in stone. For instance, a road could be regarded as a path or an edge in different circumstances, a train station could be a node or a landmark. The elements need to be patterned together to supply an urban form. In reality, it is not the sole element that offers the way of organizing the image of the city, but the total patterns. Most observers seem to group their elements into intermediate organizations, which might be called complex (Lynch, 1960). The observer senses the complex as a whole, and in the whole, its parts are interdependent and are relatively fixed in relation to each other. The elements in the whole may reinforce each other, resonate so that they enhance each other's power; or they may conflict and destroy themselves, and thus the whole (Lynch, 1960).

3.2 SPATIAL DEVELOPMENT CONCEPT'S THOUGHT

The spatial development concept is based on a system of interrelated and integrated spatial elements which together make up the desired spatial development form for the municipal area (South Africa, Municipality of Mogale CityMunicipality of Mogale City

The essence of the spatial development could be abstracted as: the functional relationships between different spatial locations induces the movement of people, goods and services. The solid, durable movement give rise to specific routes that describe a network of interaction, where the function aggregate offer the people, goods and services to interact intensely gives rise to activity nodes, the intensity of the activity of the nodes gives rise to the development of a hierarchy of nodes of different sizes and importance depending on the level of interaction taking place in a node (South Africa, Municipality of Mogale City, n.d.). In the development of the network and the nodes, some related land use inside the networks and between the nodes are developed and act as the surfaces that tie the system of networks and nodes together.

The elements of a town is strongly related with the type of the society. In agriculture society, the movement network are mostly for the pedestrians, and the nodes are mainly characterised by the residential nodes, agricultural production nodes, several commercial nodes, and the surface are related to the network and the nodes. While in the modern society, the network must accommodate the modern transportation manners, and be capable to deal with the needs of movement produced by the people, goods and services. The activity nodes tend to be diverse, intensified and specialised, including a hierarchy of the residential, industrial, commercial and recreational activity nodes. And hence the modernisation and expansion of the surface. The network of activity nodes is reinforced by a system of activity spines which connect with these nodes. Activity spines can be defined as concentrated urban development along movement routes which are typically also major public transport routes (South Africa, Municipality of Mogale City, n.d.).

3.3 THEORIES OF URBAN STRUCRURE

3.3.1 BURGESS'S CONCENTRIC ZONE THEORY

The model was created in 1925 by E.W. Burgess, Robert Park, and Roderick McKenzie. As a result of examining a number of cities, especially Chicago, Burgess suggested the division of cities into a number of concetric zones which is the competence result of different social groups searching for the best area for their futher development. He pointed out that the typical processes of the expansion of the city can best be illustrated by a series of concentric circles, and as the city grows, each zone must spread and move

outward, encroaching the next one, creating miniature “zones of transition” and setting into motion various land-use successions. Thus it is essentially a growth model concerned with radial expansion as a concomitant process of urban growth (Klaff and Schnore, 1971)

3.3.2 SECTOR THEORY

The Concentric theory of Burgess was based on the conditions of American cities in 1920. Since then, picture of cities had changed and therefore, Homer Hoyt proposed the sector theory in 1939. In this model, Hoyt took “the accessibility caused by transportation routes” into consideration, and concluded urban land use pattern was not in concentric circles, but rather sectors. Thus, the effect of direction and time was added to the effect of distance. Transport corridors, such as rail lines, public transit and major roads, are mainly responsible for the creation of sectors (Sector and Nuclei Urban Land Use Representations, n.d.).

Hoyt's sector model assumes a shape much like that of a pie from which pieces are cut at random. Each of the types of land use is orientated to an important factor in its growth and development, i.e. industry is drawn to railroads and waterways, commercial establishments are drawn to main traffic arteries; while residential areas tend to be situated around the other areas (the low class residential sectors are located around the various manufacturing and functional elements as a matter of convenience to the worker rather than being drawn to the CBD) (Riley, 1958).The model suggests that, over time, high quality housing tends to expand outward from an urban centre along the fastest travel routes (Torrens, 2000).

3.3.3 MULTIPLE NUCLEI THEORY

Following Hoyt's development of a sectorial city, Harris and Ullman introduced a more effective generalization of urban land uses. It was brought forward that many towns and nearly all large cities do not grow around one CBD, but are formed by the progressive integration of a number of separate nuclei in the urban spatial structure.

This model is amongst the most innovative descriptive or analytical urban models (Torrens, 2000). The city's CBD was losing its importance in relation to the rest of the city, it is innovative in its recognition of the city as multi-centered. The novelty in multiple-nuclei theory also lies in its acknowledgement of several factors that strongly influence the spatial distribution of urban activity: factors such as topography, historical influences, and special accessibility (Torrens, 2000).

4 METROPOLITAN REGION LEVEL

The metropolitan region includes the built-up urban area and the economically connected territory to the outside (Definition of Urban Terms, n.d.). It reflects the economic expanse of an urban area and is generally defined by the commuting hinterland of an urban area, and is the product of the industrial society which enables such efficiency of commuting.

There is not a unified theory discussing urban morphology at this level, since at this level, either explanation of the formation or sensing from a physiological perspective is tough. At this macro level, structure is the main focus in terms of urban morphology, thus the elements on this level should be the ones that could influence the changes of metropolitan region structure, the centre and subcentre, the dominant transit and the large-scale projects are those ones.

4.1 CENTRE AND SUBCENTRES

It is undeniable the main driver of the formation of the metropolitan region is the centralisation benefits of a larger modern economy and the decentralisation enabled by the new transportation technology to avoid the disadvantages of over-centralisation from the economy-geography perspective. As urban spatial structure is the spatial miniature of urban economic and social structure, the new spatial structures emerging to facilitate new forms of production (Smith, 2011).

Deconcentration is more difficult to trace in urbanized space, while the concentration of the urbanized space reflect as the urban centres and subcentres. Though the reality is more complex, a simplified picture of metropolitan regions shows a core centre city that is surrounded by its hinterland and is characterised by a clear hierarchical relationship between the core and periphery (Smith, 2011). In this simplified model, the core city is supplemented by the additional centres of various sizes, however, the core city usually are substituted by a city network of several cities with at least two equal or at least comparable cites(Germany, GIZ, 2014), for instance Rotterdam–Den Haag metropolitan region.

The dominant centre(s) of a metropolitan region is(are) characterised by the large amount of producer services, the contradiction between the demand and supply of central offices has promted the

development of other tertiary centres. Besides, the high-tech industry centres, secondary-industrial centre, political and institutional centre, residential centre, retail centres distributed across around the metropolitan areas, some consititued the subcentres, while some others could also act as a dominant centre. Holly (1993) has concluded four metropolitan forms: monocentered, multinodal, noncentered, multicentered model. And he found the multinodal model has general support in reality. The centers of the metropolitan region are the main concern of his study (even can be seen from the names of the models). Since the layout of the centres and the relations between the (sub)centres constitute the main structure of the metropolitan regions.

The centre of a metropolitan region has experienced significant change in terms of the landscape, the producer industry which is the main industry of the central area is characterised with the skyscrapers in high density and may have more landmarks. While the subcentres would have a totally different built environment either from the centre or between themselves because of the functional differences and the inherent nature of the specialisation. Thus, the urban morphology is absolutely different at the neighbourhood level or urban level because of the spatial structure difference.

4.2 DOMINANT TRANSIT

One of the main purposes of the city is to supply its residents with accessibility. Before the industrial revolution, in which era walking is the only travel mode, cities are all monocentric with a walking accessibility. The modern travel mode enables much longer daily travel distance, promoting the decentralisation of the city, which is a necessary condition for the cities to reach a metropolitan region.
Accessibility is the main reason for the transportation to transform a particular site's form, since higher accessability would attract more development chance for that area, which will change the land use pattern of that area, hence the whole morphology. For instance, the improved accessibility may induce a new shopping mall which will affect the flow of people and the surrouding morphology, and this will in turn enhance the improvement of accessiability of that area. Some of the central areas is developed with certain transportation's development. The term "edge cities "describes the process whereby new commercial centres were created in post WWII USA at the urban fringe, typically near major highway intersections (Smith, 2011). The development of those newly built attractions will change the flow of the people and hence the structure of the metropolitan region.

The modern transportation could act as an impetus of decentralisation. However, since the development of the transportation could not only induce the people to move outwards, but also enhance the accessibility of the traditional centre for the people living in outer fringe, it could also act as a centripetal force for the spatial structure. The dominant mode of the transportation displays its particular network logistics to its affiliated area, thus introduces complementary built-environment forms they encourage, pulling urban development towards certain spatial structures (Smith, 2011).

Thomson proposed urban archetypes that fully embrace the complementary spatial structure for particular transport modes. For rail dominated cities, the complementary spatial strucrue is the monocentric form which provide the high accessbility to the centre, whilst orbital accessibility is poor; while the full motorisation archetype provides high accessibility across the whole city, which encourages a low density dispersed pattern (Smith, 2011). Though the mode is to some extent extreme, some similar examples in the real world could be found. Tokyo metropolitan area, which is underpinned by its rail system, retain its strong centre in the inner city; Copenhagen, with a finger plan supported by the rail system, still shows a more monocentic structure than its European cousins; while Los angles, the car-dominant area, is famous for its non-dominant centre structure and the notorious urban sprawl.

Urban transportation networks have the characteristic of path dependence. Since the development of urban transportation system calls for a great deal of investment, the demolition and reconstruction of the system may more than double the investment, which is almost impossble. Once the dominant transportation system has formed, the development of the other system may have little effect on the whole, the built environment of the area tend to enhance the original dominant system. Therefore, once constructed, the dominant transportation system of a metropolitan region tend to last for a fairly long period, and will structure the metropolitan region in its own way.

4.3 LARGE-SCALE PROJECT

Large-scale project, which is always on the planning agenda of many metropolitan regions, seeks to attract the flows of international investments in the globalization context. These large-scale projects could range from the revitalisation of the traditional city centres (used to be the dominant form in around 1950s) to the focus on the periphery of the city (dominant form of the contemporary world).

The change has displayed the transformation of the backdrop of the integration against which the largescale projects involved themselves in, which could also help to explain the formation of the

metropolitan region. With regard to globalisation, the location preference's change could reflect the changes as how the cities are willing to connect themselves with the global market; With regard to the transport aspect, the preference's change shows the technical advances and the increase of car ownership in the last few decades; with respect to the economic development, the preference's change offers a clue of the transformation of the secondary industry based economy to a tertiary industry based economy and the choice change of those prime offices; with regard to the spatial pattern, the preference's change illustrates the construction of the infrastructure and the government's focus change. All of these changes could all contribute to the location choice changes of the large-scale projects. Those large-scale projects could be regarded as the physical entity that serves to connect the metropolitan region, and promote metropolitan urbanisation, since these large-scale projects are symbols that the city no longer behaves locally limited, and could also act as the combination joint of the metropolitan region, such as an airport.

Though there are extremely changes in terms of the location choice and related built environment, some invariable ingredients could still be found in the large-scale projects. The symbol function which mainly manifests in the architectural excellence is a significant one, another one could be summarised as the expected associated spatial outcome. An airport could be a typical example in explanation, since the airport could act as the anchor in increasing volumes of business travellers, tourists and goods flow through airports, and may lead the hinterland to expand into employment, residential hubs. London has utilised the 2012 Olympic games to "create" its east as a new prosperous hub with the related office, real estate, commercial, tunnel development.

These projects could not only change the morphology of its own area, but also the structure of its own city or even the metropolitan region. The influence of the large-scale projects could be long-term, the prospects of the development could attract subsequent investment, such an area may probably become a subcentre of its situated city and also enhance the role of its situated city in the metropolitan region, thus transform the structure of the metropolitan region.

5 SYNTHESIS AND DEVELOPMENT OF THE FRAMEWORK

5.1 FOCUSES ON VARIOUS LEVELS

After discussing the thoughts at different levels, a synthesis is essential to identify the similarities and differences and helpful to develop a framework in terms of urban morphology (Table 1). At the neighbourhood level, the focus is mainly on the micro level, though Pereira's thought used the terminology urban form, urban style, her focus is still on how could the newly-built pattern be designed into tissue thereby fitting into the existent landscape and form an urban style altogether, thus the terminology used to cut into the urban morphology at this level is pattern; the elements examined by Conzen and Caniggia are building, plot (lot), street (route), block, land use, they see how those elements pattened together, formed different types, then identify the process of morphological changes. In Pereira's thought, buildings and the street system still exist, but she has also emphasized the landscape/soil and the word network, which means that in the newly developed environment, the original landscape of that city and the natural environment should be considered while developing; and the word "network" also reflect the integration focus between the newly-built and the existent entity. The terminology and the elements examined reflect the focus of the this level are the small part landscape of a city and its pattern, type, the formation process of it and the compatible ability with the original part.

At the town level, from the perspective of the terminologies that cut in the urban morphology, the angle of this level is more macro than the neighbourhood level. Though in Lynch's thought, pattern still retains, the meaning has changed, pattern is mainly used to build the identity of the entities so that it could be structured to form the complex, and the whole, thereby developing the whole image of the city. In the spatial development, the focus is on the essence of the spatial development of the town, from a relatively physical and abstract perspective. In Burgess, Hoyt, Harris and Ullman's thoughts, the urban structure has become the focus, which is different from Lynch's thought, although the two structures both means relationship: Lynch's thought's structure mostly focuses on the physical relationship, while the structure of Burgess, Hoyt, Harris and Ullman's thoughts focus on the functional aspect, the physical structure serves as the spatial reflection of the functional structure, this is why the function is the element they examined. In Lynch's thought, paths, edges, districts, nodes and landmarks are the elements which serves to develop the imageability, the elements could also be used to explain the urban morphology, for instance, the landmark could be a drive of the development of the surrounding area, the edge could be seen as an obstacle that block the continuous development, two kinds of urban morphology developed in both sides of the edges. At this level, the mainly focus has developed from the part to the whole, how could the whole been developed and how could the whole run and reflect in spatial dimension.

The metropolitan region, which is a product of the post-industrial society, does not have a unified thought in exploring its morphology. Its focus is so macro that the pattern cannot fit in analysing its morphology,

whereas structure which focus on how the metropolitan region run and the relationships between different parts has been the focus at this level, thus urban structure is the terminology cutting into morphology at this level. The elements examined are the ones that could influence the whole structure of the metropolitan area. At this level, the main focus is absolutely on the whole, how the spatial structure was and evolved into the current one.

Scale	Terminology	Method	Elements examined	Typology
Neighbourhood	Pattern	Conzen	Building, plot ,street, block, land	
	Urban tissue	Caniggia	Building, lot, route, block, land use	
	Urban form, urban style	Luz Valente-Pereira	Landscape/soil, the outdoors space(circulation space network and outdoors meeting space network) and buildings	
Town	Pattern, urban structure	Lynch	Paths, edges, districts, nodes and landmarks	
	Spatial development		Nodes, networks, and surfaces	
	Urban structure	Burgess, Hoyt, Harris and Ullman	Urban function	Concentric, sector, multiple-nuclei
Metropolitan region	Structure		Centre, subcentres, dominant transit, large-scale projects	Monocentered, multinodal, noncentered, multicentered

Table 1 - Synthesis of the different thoughts

5.2 SYNTHESIS AND DEVELOPMENT OF THE FRAMEWORK

After discussing the different focus of urban morphology at different levels. Offering a definition of urban morphology is suitable at this stage, based on the analysis above, urban morphology could be defined as the research to explore the change of physical urban form as the time flows, with different focus of urban form at different levels: at the neighbourhood level, urban form means the patterns and their integration to form an landscape, at the town level, urban form means the formation of the whole and the structure of the whole, at the metropolitan level, urban form means the organisation and structure of different wholes to form a metropolitan region.

Scale	Elements Examined (original)	Elements Transplantability								Element Examined (improved)
Neighbouhood	building, plot, street, block, land use, open space, landscape/soil	building	plot	block	street	land use	open space	\	landscape/ soil	building, plot, street, block, land use , open space, landscape/soil
Town	network (path), edges, districts, nodes, landmarks, urban function	landmark	node	district	network (path)	function	\	edge	natural condition, original urban form	network (path), edges, districts, nodes and landmarks, urban function, natural condition, original urban form
Metropolitan region	centre, subcentre, dominant transit, large-scale projects	large-scale projects	sub-centre/centre	sub-centre/centre	dominant transit	function	\	dominant transit	natural condition, original structure	centre, subcentre, dominant transit, large-scale projects, natural condition, original structure

Table 2 - Elements Transplantability and Analytical Framework

In order to get a systematic framework for the urban morphology analysis, some minor difference of the difference should be neglected, for instance the plot and lot in Conzen and Cannaggian's thought respectively, which means some of the elements could be substituted by one element due to the similarities. Besides, we could observe the transplantability of certain elements at the different levels, such as the street – path/network—dominant transit, such transplantablity ability at different levels could reflect the continuity of the urban form at different levels, and could also act as the complements of the elements of different levels. The transplantability of the elements and the improved analytical framework is shown in table 2.

The elements at a level is not set in stone, for instance, the large-scale projects could also be the nodes at the town level and building at neighbourhood level, the transplantability pattern listed in the diagram is just the one that meets the contrast at each scale. In reality, there could also be some confuse in the identification of the elements, for instance a train station which could be identified as a node at the town level could also be regarded as an edge, since the urban form behind and in front of the train station could be very different; the train station could also be a landmark at the town level, could also be a large-scale projects at the metropolitan level as long as the train station is big enough and has aroused certain developments, could also be a building at the neighbourhood level. Therefore, the framework offer an analytical framework for the urban morphology, and also supply some flexibility for the analysis, the entity could be identified according to the level it stayed in and the function it act in the analysis.

5.3 UTILISATION OF THE FRAMEWORK AND THE SUBSEQUENT RESEARCH

The analytical framework is helpful to detect what kind of elements is the key in studying urban morphology at different levels, though the different focuses of urban morphology has already been identified, with the analytical framework, a clear clue about how could the different focus at different levels be realised in the study of urban morphology could be acquired, and get to know the different elements that is going to research at different levels. For instance, if urban morphology at the neighbourhood level is the research target, the building's pattern should be a key point, which would include the buildings' façade, while at the town or the metropolitan region level, the façade of the buildings cannot be the research focus.

In the following research, the policy will be introduced, and the relationship between the polices and the urban morphology at different levels in China is going to become the research focus. Although the research on the policies and the urban or metropolitan region structure has already had some outcome, such research on neighbourhood level is still absent and is worth researching. And China, as the emerging country in the last few decades, the speed of its urbanisation has dwarfed its counterparts. The urbanisation process also has its own characteristics. But according to the characteristics of the Chinese jurisdictional boundaries, the analytical framework which is based on the western thoughts need to be adapted to the Chinese reality, and then used into the research on policy and morphology.

BIBLIOGRAPHIC REFERENCES

Chen, F (2010). A New Research Framework: the Application of Urban Morphology Typology in China. Architectural Journal, 4, 85-90.

Cömert, N. Z. (2013). Testing an Integrated Methodology for Urban Typo-morphological Analysis on Famagusta and Ludlow (PhD's thesis), Eastern Mediterranean University, Gazimagusa, North Cyprus.

Definition of Urban Terms. (n.d.). Retrieved from http://www.demographia.com/db-define.pdf

Germany. Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH (2014). Metropolitan Regions as Governance Systems. Retrieved from http://www2.giz.de/wbf/4tDx9kw63gma/Metropolitan-Regions_Definitions_Typologies.pdf

Hughes, H. L. (1993). Metropolitan Structure and the Suburban Hierarchy. American Sociological Review, 3, 417-433.

Klaff, V. Z., & Schnore, L. F. (1972). The application of the Burgess zonal hypothesis to 75 Cities in the United States (Working Paper No. 72-78). Retrieved from http://www.ssc.wisc.edu/cde/cdewp/72-28.pdf

Kropf, C. (2005). The handling characteristics of urban form. Urban Design, 93, 17-18.

Kropf, C. (2009). Aspects of urban form. Urban Morphology, 2, 105-120.

Lynch, K. (1960). The image of the city. Massachusetts Institute of Technology, Massachusetts: The M.I.T. Press.

Moudon, A. (1997). Urban morphology as an emerging interdisciplinary field. Urban Morphology, 1, 3-10.

Niković, A., Đokić, V. & Marić, I. (2014). Revising the position of block within the morphological frame of a traditional city: contemporary perspectives. SPATIUM International Review, 31, 1-6. doi: 10.2298/SPAT1431001N

Pereira, L. V. (n.d.). Urban Form Definition in Urban Planning. Retrieved from: https://www.academia.edu/5879991/URBAN_FORM_DEFINITION_IN_URBAN_PLANNING_-_SINOPSIS

Riley, K. D. (1958). Zonal and sector theories of internal urban structure applied to Tulsa. Retrieved from: http://digital.library.okstate.edu/OAS/oas_pdf/v39/p176_177.pdf

Sector and Nuclei Urban Land Use Representations. (n.d.). Retrieved from https://people.hofstra.edu/geotrans/eng/ch6en/conc6en/sectornuclei.html

Smith, D. A. (2011). Polycentricity and Sustainable Urban Form: An Intra-Urban Study of Accessibility, Employment and Travel Sustainability for the Strategic Planning of the London Region (PhD's thesis, University College London, London, Britain).

South Africa. Municipality of Mogale City. (n.d.) The Spatial Development Concept. Retrieved from http://www.mogalecity.gov.za/content/pdfs/2009_sdf11_8.pdf

Torrens, P. M. (2000) How Land-use Transportation Models Work R. Centre for Advanced Spatial Analysis University College London. (Working Paper No.20). Retrieved from http://discovery.ucl.ac.uk/1365/1/paper20.pdf

Wang, H. & Zhou, K. (2014). Review of urban form, structure and morphology in China during 2003-2013. Progress in Geography, 5, 689-701.

Whitehand, J. W. R. (2007). Conzenian urban morphology and urban landscapes: Proceedings of the 6th International Space Syntax Symposium, Istanbul.

ID 1458 | CONFORMANCE VS PERFORMANCE: ZONING OF THE URBAN AGRICULTURAL ZONES IN TAIWAN

Chen Yu-Wen[1]; Chao Tzu-Yuan[1]
[1]Department of Urban Planning, National Cheng Kung University
bb98120720@gmail.com ; tychao@mail.ncku.edu.tw

1 INTRODUCTION

1.1 TWO TYPES OF PLANNING

Urban planning is the result of political decision-making, but planning methods or tools cannot act as a panacea for problems in the city of globalisation and urbanisation. In general spatial planning theory, there is two type of planning, conformance-based planning, and performance-based planning. According to Umberto (2008), these two planning models relate to respective cultural assumptions and technical procedures finally producing, in virtue of their juridical effects, different operational consequences on spatial development and on territorial governance. In conforming planning, a normative prescription or standard will be established, end up generating project plans that focus on the adoption of the project. Although material effects of the plan easily to be evaluated, the initial plans may be misread or interpreted in unexpected ways and result in otherwise outcomes. In performing planning, the planner will propose a vision of future spatial development and make future open, then strategic plans produced in the dynamic negotiation of decision making. That make the objectives of the plans remain flexibility but the effects hard to be evaluated (Faludi, 2000; Umberto, 2008). The former was widespread in almost all European countries and the United States, and the latter can be seen in Dutch and United Kingdom, now being increasingly practised across Europe.

1.2 FROM TRADITIONAL ZONING TO PERFORMANCE ZONING

In planning practice, the conformance-based planning is usually implemented as traditional zoning to achieve the planned objectives. Traditional Euclidean zoning separates land uses in a hierarchy based on land use type, dividing residential, commercial, and industrial land uses in prescriptive zones. Under the traditional zoning tools, planners delineate the scope of different land type, establish the category of land