Impact of Design, Establishment of Knowledge: The Exchange Between the Design Project and the Conceptual Framework of the City

Marijn Van De Weijer, K.U. Leuven/ UHasselt
Koenraad Van Cleempoel, UHasselt
Hilde Heynen, K.U. Leuven

Abstract

A design is based on knowledge, intuition and skill, which are embedded in the process, but are only partially communicated by the results for further development. This paper investigates in what manner design can perform as an instrument of research. As a case study, design work performed by the author in an academic environment, having Hanoi as the locus of investigation, illustrates how architectural questioning exceeds the process of establishing proof to make the case for a design approach, but moreover, can establish scientifically exchangeable knowledge.

Primarily, the studio established a vision for urban development, consolidated within a number of strategic projects. In doing so, it devised an urban paradigm that was tested with design proposals. Secondly, the studio results are involved in a critical review of underlying theoretical concepts. If a design approach is not able to prove the hypothesis defined in an urban vision, the applied framework experiences a crisis as defined by Thomas S. Kuhn. Considering that a framework is established by theory, and design tools are developed and applied within practice, research by design reflects upon both aspects. This leads to an explanation of urban phenomena defined within the discipline. As a research practice, the design addresses lacunas, resulting either in an affirmation or a collapse – a crisis – of the theoretical framework. The specific case of Hanoi asked for the juxtaposition of 'postmetropolitan' theory focused on the city territory and theory of 'everydayness,' analysing small scale spatial production. Thus, the findings of this study present an approach that considers the interaction between the fragment and the overview.

1. introduction

Human Settlements are the material counter form of society, and reflect the complexity of the civilisation by which they are established. This condensation testifies of the interaction between technological progress, institutional control and human endeavour. The method of shaping the environment can be equally durable and withstand changes imposed by political, social or economical development.[1] As a result, a settlement pattern can be built up from physical situations that do not function to present-day standards. As around the world architecture and urbanism have to address a rapid development of city regions, growth occurs through the reproduction of spatial systems that are not capable to sustain urban life when enlarged and applied to another level (Fig. 1).

Figure 1. Architectural principles subverted by density. Housing in Hanoi.

Within the architectural discipline, this situation would be studied on both a practical and a theoretical level. The architect 'in the field,' has a clear mandate, which is giving form to space required by people, and approaches the task with a set of concepts and instruments that are proper to the discipline: the tools of a designer. The researcher, practicing within the walls of the university, usually does not use architectural instruments to study architecture, often because it is studied from a related discipline. However, also a researcher with the same academic roots as the practitioner, would investigate the field and come up with results that lead to 'knowledge about architecture' and not 'knowledge of architecture.'[2] This leads to the question whether the instruments of the designer, being proper to the discipline of architecture, can provide a different sort of knowledge, that is fully inscribed in both the practical and theoretical aspect of the profession.

With this paper, a methodology for research by design is elaborated. As a case study, an urban design studio held as a part of the Master of Human Settlements programme at the K.U. Leuven[3] regarding the city of Hanoi, Vietnam, illustrates how architectural questioning exceeds the process of establishing proof to make the case for a design approach, but moreover, can establish scientifically exchangeable knowledge. This paper aims to build further upon the structure and conclusions of this design project, which is rooted in the research approach of the department of Architecture, Urbanism and spatial Planning in Leuven[4] and in the fruitful cooperation between professors and

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[1] HOMMELS, Anique, *Unbuilding Cities, Obduracy in Urban Sociotechnical Change*, Universitaire Pers, Maastricht, 2001

[2] HEYNEN, Hilde, "Unthinkable Doctorates? Introduction", in: *The journal of Architecture*, vol. 11, no. 3, June, 2006, pp.277-282

[3] The Studio 'Water Urbanism in Hanoi, Red River + Lakes,' part of the 2008-2009 MaHS/ MaUSP postgraduate programme, ASRO department, K.U. Leuven, Belgium, was organised and mentored by Prof. Kelly Shannon, Ward Verbakel and dr. Benoit Legrand. Studio participants: Ayasha Siddiqua, Bardia Mashhoodi, Bart Pluym, Dagnachew Getachew Assefa, David Chi-cheng Yang, Emil Zane Sinclair, Ling Chan, Marijn van de Weijer, Nguyen Chi Trung, Pamela Hayne Maro, Patrick Lootens, Sherin Abd El Rahman, Stephen Nyamato, Wei Guo, Xiaoxiao Ma.

[4] Further elaborated in K. SHANNON, "Vietnamese field/work: The case of Hanoi's water urbanism" in: CLARE BERNIE, Victoria, EWING, Suzanne, MCGOWAN, Jeremie, SPEED, Chris (eds.) *Field/ Work AHRA Critiques Series*, Routledge, London, forthcoming, November 2010, p. 81-91

students. To make this case, the paper is structured around three topics. Primarily, it reflects upon theory regarding research by design. Secondly, the situation of Hanoi is explained according to performed fieldwork and urban theory. Thirdly, the design is shown as a method to bring together theory and practice within a project, in order to mediate between the two and come forward with knowledge derived from both aspects.

2. Design as an instrument for research

The design studio addressed the greater Hanoi region. It now is being inhabited by 6.2 million people, and is expected to cater for a population of 10 million by 2030. Agricultural land is rapidly being urbanised. The studio goal was to structure that growth through the revision of landscape and infrastructure. In itself, it was an applied research on a specific spatial situation, and investigated the possibilities of an alternative to current Vietnamese planning methods. The main design method was based on the focus on a strategic approach that is advocated in Leuven.[5] The output consists of spatial reproduction, caught in maps, plans and follow-up questions. Research delivers a different view on space and practice. But can this process also work in two ways? Can design also be a double edged sword, interpreting space and practice to question theory?

In order to relate design tools to research, the normal process of science needs to be compared to the process of design. Traditionally, science and design have a number of methodological contrasts based on which, they are considered as opposites. Nigel Cross enumerates a number of these antitheses,[6] which serve as the basis for an elaborated list of contrasting lemmas:

Science		Design
Generic	>	Specific
Standards, rigour	>	proper rules
Explicit knowledge	>	Tacit knowledge[7]
Exchangeable fact	>	Personal choice
Convergent	>	Divergent
Problem defining	>	Problem solving
How things are	>	How things ought to be

These issues generate a broad discussion within the field of design sciences, especially with regard to whether design can be used as a scientific research method, generating innovative and valuable knowledge. In that case, the methodology is termed *research by design,* and is distinguished from *research into design* –which studies the work of designers- or *research for design* – which generates knowledge to be used by designers.[8] It is the statement of this paper, that research *can* be done using design as a method, and that the gap between science and design can be bridged.

Therefore, Kuhn's principle that scientific practice is being exercised within the boundaries of a fixed paradigm is relevant here.[9] Comparison of paradigms, and their methods and questions, can prove problematic. This lack of communication is termed incommensurability.[10] Researchers solve problems using concepts and methods defined within a scientific paradigm. Only those problems that can be solved are being addressed by this method; as soon as a problem is outside of the reach of the familiar methodology, it often is ignored. To determine whether a problem is in or out of the appropriate frame, a set of rules is defined to delimit acceptable solutions. If a certain paradigm is accepted without contestation, a given problem will automatically be researched according to the rules defined by the paradigm. If a research approach is not able to prove the hypothesis from within the boundaries of the paradigm, the applied framework experiences a crisis, and is succeeded by a new one. This can be achieved by looking across the boundaries of a paradigm, to include a cross- disciplinary discourse.

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[5] De MEULDER, Bruno, LOECKX, André, SHANNON, Kelly, "A Project of Projects", in: *Urban Trialogues, Visions Projects Co-productions*, UN-HABITAT, Nairobi, and PGCHS, Leuven, 2004, pp. 187-198
[6] CROSS, Nigel, "Designerly Ways of Knowing: Design Discipline versus Design Science", in: *Design Issues*, vol. 17, no.3, Summer 2001, p.51

[7] Tacit Knowledge as defined in: POLANYI, Michael, *The Tacit Dimension*, Peter smith, Gloucester, 1983
[8] FRIEDMAN, Ken "Research into, by and for Design", in: *Journal of Visual Arts Practice*, vol. 7, issue 2, 2008, pp. 153-160
[9] KUHN, Thomas S, *De Structuur van Wetenschappelijke Revoluties*, Uitgeverij Boom, Amsterdam, 2003 (¹1962)
[10] op. cit. 9, p.203

The notion of the project, as it is used in architecture, provides a useful encapsulation for a research method, which allows to cross disciplinary boundaries and to develop knowledge in an explorative way, unlike the puzzle solving of Kuhn's 'normal science'. The project is defined as a position to be taken from which questions can be asked regarding both the knowledge and the tools used in obtaining it.[11] Drawing (representing spatial situations and reflecting on ways to intervene) is the main instrument of architecture within this project. Spatial phenomena are analysed and communicated, within a well defined disciplinary field. At the same time, since the strongest characteristic of the profession is design, with its explorative and testing nature, a design project could be exactly the field in which the investigative discipline is defined clearly, and the point from where the discipline commences its intersections with related fields: Chris Younès argues that the discipline should be well defined in order not to dilute in this cross- disciplinary discourse. Thus, architecture has to define and build its own body of knowledge.[12] Paradigms should be interpreted and translated into the language proper to the field of architecture. With regard to the definition of a project as a base for research, the proper condition of scientific rigour can be added; the project should allow for well defined conditions of exchange and reflection.[13]

Furthermore, contradicting the assumption that architectural strategies are exclusive to the practitioners opens a view to an investigative enterprise that critically addresses the architectural discipline, both in the fields of practice and theory, as put forward by Davidts et al.[14] From this viewpoint, a classical separation between intellectualisation and practice is unproductive in surpassing the division between the university as the seat of theory and the field as the locus of practice. How can this separation be overcome?

Research by design, especially in an academic environment, can address practical issues that are rooted in society and are advocated by relevant stakeholders with various backgrounds, but, instead of generating design ideas to come to a practical solution in an efficient way, use design to generate a new interpretation of existing problems and reframe the issues at stake.[15] In line with changing practices, the academic studio is also more and more organised as an experimental environment where designers work and investigate together. Helen Furjàn explains how this alters the way designers work: " Practice – whether in the office or in the school – is now a laboratory: group orientated, open-source, networked and hybrid."[16] Therefore, a large creative production is used as a method of questioning theory and testing hypotheses.

Following these methodological remarks, this paper discusses the condition of Hanoi based on two modes of spatial production and their theorizations. On one hand, we have top- down planning exercised in the use of Master plans, thinking about the structure of the city starting from the large scale. On the other hand we have bottom- up local spatial production, consisting of small scale initiatives that together make up the nature of the city. Both of these modes are practiced in Hanoi, and both fail in structuring the city in a qualitative way. Both modes can be seen as paradigms in crisis. In the following paragraph these conditions are explained and clarified theoretically, based on field work exercised during a two week workshop on urbanism in the greater Hanoi region.[17] Thereafter, this paper explains how a project incorporates these theories together in a research by design in order to reflect upon practice and theory, in an attempt to overcome this paradigmatic incommensurability.

[11] DAVIDTS, Wouter, DELBEKE, Maarten, LAGAE, Johan, LEACH, Andrew, "The Inconceivable Agenda", in: *The Journal of Architecture*, vol. 11, no. 3, June, 2006, pp. 353-357
[12] YOUNÈS, Chris, "Doctorates Caught Between Disciplines and Projects", in: *The Journal of Architecture*, vol. 11, no. 3, June, 2006, pp. 315-322
[13] Op. Cit 12, p. 319
[14] Op. Cit. 11.
[15] HEYNEN, Hilde, SMETS, Marcel, SHANNON, Kelly, *Research by Design in Architecture and Urbanism,* unpublished position paper, K.U. Leuven, February 2010
[16] FURJÀN, Helen, "Design/Research, Notes on a Manifesto", in: *Journal of Architectural Education*, Vol. 61, No.1, pp. 62-68 (p. 64)
[17] Workshop 'Water Urbanism in Hanoi: Red River + Lakes', 12-20 February, organised by the Urban & Architectural Institute of the University of Civil Engineering (UCE) Hanoi, Vietnam, K.U. Leuven, The Vietnamese Institute of Architecture and Planning (VIAP) and the Forestry University of Vietnam. The workshop was directed by Prof. Doan Minh Khoi, Prof. Kelly Shannon, Dir. Pham Thi Hue Linh and Dr. Pho Duc Tung.

3. How does fieldwork follow into theoretical reflection? The condition of Hanoi

Hanoi exemplifies the ambiguous relation between the local and the global or the vernacular and the modern, the arena in which the condition of displacement induces the contestation over the meaning of space and objects. Vietnam is a one- party state with a free market. Facing poverty and the incapability of feeding its own population, the Communist Party opted for a change in ideology in 1986. At the Sixth Party Congress, the decision was made to open up to the global market economy. Vietnam was brought into the sphere of influence of the West. Western investment has brought more prosperity, but the new wealth is not divided equally, and the growing fragmentation of society, visible in a developing separation between rich and poor, now worries the Vietnamese population.[18]

The city is overwhelming and captivating. Its tissue is stretching out from the old city core along its main radial roads in a dense, monotonous way. The omnipresent honking of claxons, the numerous plastic chairs obstructing the walkways and the dense urban fabric all relate the story of the growing city. One of the most noticeable aspects of modern life in Hanoi is the use of motorbikes. Since almost every inhabitant of the city has one, Honda engines fill the street with their nerving sound and dizzying exhaust fumes. The crowded city is vibrant, street life is the norm. In search of new places to build, the historical relationship to the landscape of small lakes is sacrificed as they are filled and built over. This situation extends into the countryside. The outskirts of the city are encroaching the small rivers of the Red River Delta.

Like in many Asian cities, a rapid development of built fabric rarely is accompanied by an appropriate adaptation in the urban infrastructure. William Lim sees this as the main weakness of East Asian cities.[19] In Hanoi, developments have occurred in historical tissues like the ancient quarter, the old commercial heart of the city that was given its name by its urban structure: the 36 Streets District. The French Colonial District, characterised by its rational grid structure, also had to support implantation of large, new structures. These districts have managed to cope with these changes, though their character has changed with it, as the historical street layout had to deal with more and more traffic, at the cost of public space.

Urban expansion now shows the marks of foreign protagonists. Korean, Indonesian and Japanese conglomerates draw up generic city expansion. On the edge of the city, the first gated communities appeared, as well as several golf courses. The last green spaces close to the city centre are envisioned to grow into urban centres.[20] Rapid design-and-build actions of high rise buildings define a changing urban field in the cities that support the rise of the Asian 'Tigers.' These buildings exemplify the thinking in the here and now, and the "lack of architectural theories and knowledge of how to re-link her immensely rich heritage to contemporary urban projects."[21]

On the other hand there is the effort local people make to shape their own environment. 'Everydayness' is certainly a potent method to read the urban reproduction. The main daily practice of the Vietnamese is performed in the public sphere. As they open up their houses every morning to the streets, public life enters the spaces adjoining the sidewalks, and private life is moved on to the pavement. Daily life makes a mockery of designed life, as the street profile with its sidewalks and driving lane is rendered insignificant; people sit on the pavement, walk in the lane, cross the roads as they please (Fig. 2). This congestion is an expression of the general wish to thrive and survive in the city context, something that was kept in check by former communist policies to move people to the countryside as much as possible. After dark, the streets become empty quite quickly, the nightlife is limited to some market places, and so the cycle of day and night is felt quite strongly as a governing rhythm.

As a result of these described mechanisms, It is difficult to address growth in a structured way. Several master plans for Hanoi have been drawn up, but are always caught up by

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[18] LOGAN, William S, *Hanoi, Biography of a City*, University of New South Wales Press Ltd, Sydney, 2000

[19] LIM, William S. W., "The Dynamics of East Asian New Urbanism", in: HEYNEN, Hilde, HENKET, Hubert-Jan (eds.), *Back from Utopia, the Challenge of the Modern Movement*, 010 publishers, Rotterdam, 2002, pp. 198-205

[20] *Hanoi New Town Project (phase 1), Tu Liem District*, Korean H.N.T. Consortium, April 2003.

[21] Op. Cit. 19, p. 205

reality or political and cultural adversity.[22] The Vietnamese shape their environment on a small scale, taking matter into their own hands but also sacrificing valued landscape elements to a colourless urban sprawl. The ongoing growth and the resulting monotony raise the question: what would be the most feasible design approach to deal with an urban mechanism that is over complex and out of control?

Figure 2. Street life in Hanoi. Claiming public space for numerous uses.

This question fits into the discussion on the ongoing growth of urban areas. The relationship between centre and periphery is an essential topic within this discussion. A deformation of the idea of the traditional metropolis has influenced this relationship. This results in a new modus of everyday life, taking place in the *postmetropolis*, in which urbanized space has shaken the traditional image and its relation to the centre, and has inverted its geography in a focus on a system of multiple nodes.[23]

The architectural background to this phenomenon is elaborated in the book *Ladders* by Albert Pope.[24] The main interest in his work is to reveal concepts and theories behind the sprawling city, since it is not architects that determine the character of the city solely through built form, but the immense urban spaces and their infrastructure.[25] Pope therefore looks to formulate a method of decoding the qualities of space within the urban territory. According to his argumentation, this requests a reversal of the primacy of built form. Urban reality is made up from a series of self referring elements. These shards each have their own organisation and only communicate partially on the scale of a city. A perfectly equal and open system would be a complete grid, but only partially does the urban tissue really function as a grid. Rather, these half-breed raster layouts could be termed *Ladders*.[26] It is in the 'in between', the space of voids and infrastructures, that the city can be described and made intelligible.

Ladders facilitate the rupture from the core through a leap from its influence and logic. small scale investment and demand only allow for partial execution of large scale urban plans, resulting in a fragmented field of discontinuous figures. A field like this can have a number of characteristics that lead urbanisation to be seen as sprawl. In Hanoi, this can be seen as the omnipresent production of narrow, deep and tall housing buildings- no matter what environment they are put in, be it urban or rural (figure 3). This illustrates the conflict between the historical centre and its periphery that has not been altered successfully into a polynuclear field. In concluding his study Pope stipulates the absence of an encompassing urban identity, which however can be read in a positive way as a tabula rasa.[27]

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[22] The Hanoi Urban Master Plan 2020, envisioning growth to the North, on the other side of The River(1998), and the HAIDEP plan by JICA, also crossing the river (2006), are being opposed because in the eyes of the locals, the River as a central element will pose flooding danger and the plans break with the historical settlement pattern as well as the relation to the landscape based on Feng Shui principles. The Master Plan for Extended Hanoi (2008) envisions an expansion to the west, away from the Red River. Explained in presentations by Iwata Shizuo and Ngo Trung Hai during the 'Water Urbanism in Hanoi' workshop. UCE Hanoi, 12- 20 February, 2009.
[23] SOJA, Edward, "Exopolis: The Restructuring of Urban Form" in: MILES, Malcolm, HALL, Tim, BORDEN, Iain (eds.), *The City Cultures Reader,* Routledge, London and New York, 2000

[24] POPE, Albert, *Ladders,* Princeton Architectural Press, New York, 1996
[25] Op. Cit. 24, p.3
[26] Op. Cit. 24, p.53
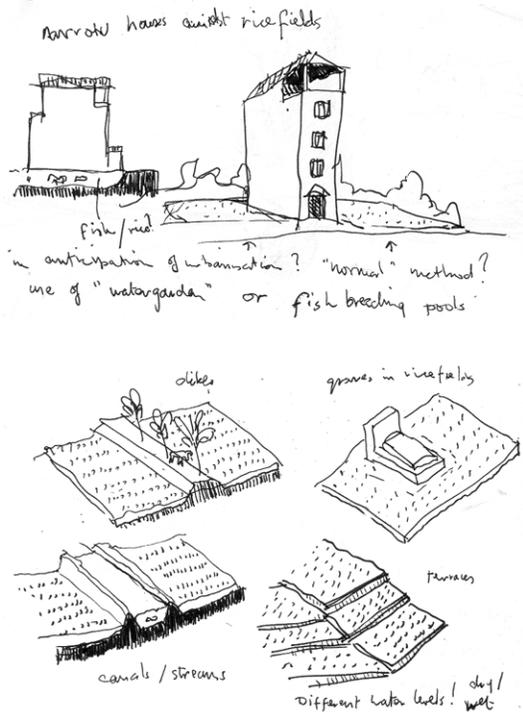[27] Op. Cit. 24, pp. 238-239

Figure 3. field work study of housing and other functions amidst rice fields.

The idea of an overarching comprehensibility of the city derived from the in- between space excluding the urbanised figures, can be inversed through recognition of the structuring capacity of fragments. From the early start of modernist thinking, fragmentation has been a part of design strategy, as the most radical ideas imagined a rupture with the existing city.[28] Even though only established in fragments, modernity was passed on and developed in its atomisation and aimed to redefine urbanity and density. This also meant that fragmentation was a part of daily life. After World War II, the French philosopher Henri Lefebvre arose as an important advocate. His theory, escaping the dominance of the architectural elite, holds productive ideas to explain the urban fabric of Hanoi and intervene in it, as this city is densely built up from fragments, that however expose the same daily patterns over and over.

Lefebvre sees the everyday as the sole constant factor in establishing a daily reality since, other than doctrine, politics and ideology, it is surviving the constant impact of revolutions. He therefore proposes to establish it as a system for decoding the modern world. If we conceive of the everyday to be present in all aspects of society, the banal can explain the real just like "the surreal, the extraordinary, the surprising, even the magical."[29] Through this lens, Lefebvre analyses symptoms of modern society - standardisation, repetition, and consumption. The monotony of repetition, a rationalisation that is brought by a linear, progressive time conception, can crush the cyclic rhythm of life, so characteristic for southeast Asia. The everyday thus is a complex system, intertwined with modernity,[30] that through close analysis can be uncovered but not easily altered. In a city constituted from spaces that do not allow a traditional mode of public life, everydayness can be the bottom up generator of new forms of public space. A basic rethinking of what could be termed as public space is a fundament for the understanding of these processes.

Margaret Crawford explains how new spatial uses arise at a point when public space is described following the rules of a dominant group in society, that does not fit the needs of new or growing 'counterpublics.'[31] As the everyday is omnipresent but elusive, hidden and obvious at the same time, the appropriation of space it generates can be both invisible and ostensive. The inscription of daily practices like washing, buying, selling and working can almost go unnoticed. As meanings are not defined and permanently changing, everyday space is temporal, existing "in between past and future uses."[32] the temporality is cyclic, returning activity to place on the basis of years, seasons, weeks, and even based on the day- night cycle. In their innocence and adaptability, these activities in themselves do not appear rebellious or capable of establishing new urban politics. In

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[28] JACOBS, Steven, "Shreds of Boring Postcards: Toward a Posturban Aesthetics of the Generic and the Everyday", in: GUST (Ghent Urban Studies Team) (ed.), *Post, Ex, Sub, Dis, Urban Fragmentations and Constructions*, 010 Publishers, Rotterdam, 2002, pp. 15-48

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[29] LEFEBVRE, Henri, "Everyday and Everydayness", in: BERKE, Deborah, HARRIS, Steven, *Architecture of the Everyday*, Princeton Architectural Press, New York, 1997, p. 35
[30] Op. cit. 29, p. 37
[31] CRAWFORD, Margaret, "Blurring the Boundaries: Public Space and Private Live", in: CHASE, John, CRAWFORD, Margaret, KALISKI, John (eds.), *Everyday Urbanism*, Monacelli Press, 1999, pp. 22-35
[32] Op. Cit. 31, p.29

the multiplication of small, insignificant and chance events lies however the possibility to redefine reality.

A regular day in the streets of Hanoi exemplifies this small scale approach by which individuals shape their environment. Every morning the streets fill up with vendors, motorbikes and children playing. And if a Vietnamese cannot find a plot to build, he will build in a rice field, in a courtyard, over water or in the air. Unfortunately, this also devours the lakeshore to linger, the tree to lie under and not in the least, space for excessive water to flow to. Equally, Pope's 'tabula rasa,' the void of urban identity consisting of the landscape in between city fragments and a polycentric field, cannot be established. It seems Hanoi has exposed a blind spot in both theories. The design studio provided the right tools to expose and address this blind spot.

4. Mediating between fragment and overview: a design approach.

In a first design step, the analysis lead to a formulation of 3 corresponding visions that pronounce a possible new future. In three strategic projects the visions are illustrated and sharpened. This strategic approach steers urban design away from the all- encompassing master plan. Current day urban complexity does not allow a one-directional approach, as the situation in Hanoi illustrates. Despite the resilience of reality, it is still possible to envision – and design – new futures, by means of punctual projects that are derived from this vision and offer insight and feedback that could readjust the envisioned point of departure. Design establishes a ' project of projects.'[33]

The visions are defined on the scale of the city region and focus separately on infrastructure, the waterscape and the structure of vegetation - both natural and cultural. These structures interact together and determine the course of further urbanisation: the interaction between the three visions will define spots on the map as favourable or unfavourable for living and building. Each vision proposes a set of spatial situations: infrastructure, water bodies and vegetation are thus diversified according to scale, function, origin and so forth. The vision for vegetation for example, was named 'Cultivating a Structure', and combined large ecological elements along the river and in the mountains, productive wetlands along smaller rivers, linear forests to prevent uncontrolled urbanisation along infrastructure, and park fields, as hybrid green spaces within the current city

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[33] Op. Cit. 5.

boundary (Fig. 4). In doing so, the visions are a constructive effort but also question spatial reproduction through a number of questions linked to them. To what extent can new infrastructures for trade and transport be used to guide an integrated process of urbanisation? What qualities can be added to the urban environment if we give more space to the natural flow of rivers? Can a conscious cultivation of particular mosaics of vegetation guide the growth of the Delta in a determined direction?[34]

Figure 4. A vision for Hanoi: Cultivating a Structure.

In combination, the visions propose an approach that differs from the aforementioned master plans. Instead of a concentric development with the current city centre as a central core, the design imagines a 'ladder structure' along existing infrastructural arteries, one that contains space for urbanisation, agriculture and ecology. The building stones of these maps came forward in a continuous process of zooming in and out, between the scale of the region, the city, and a large number of small scale *situations*. These

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[34] Questions formulated as part of the design research studio, Op. Cit. 3.

situations vary in scale and are derived from the fieldwork. Therefore, they involve the day to day reality of how a village or a neighbourhood is given shape, how a river organises agriculture, bridges and dikes, how people live, thrive and survive along a stretch of road or a street, how a lake can be the centre of a district. Structuring elements derived from the vision give room for an appropriate local development. Also, when design work exposed a flaw – a fragment of the vision insufficiently allowed for a meaningful development of space, based on appropriate local standards – the vision was developed further and improved (Fig. 5 and 6).
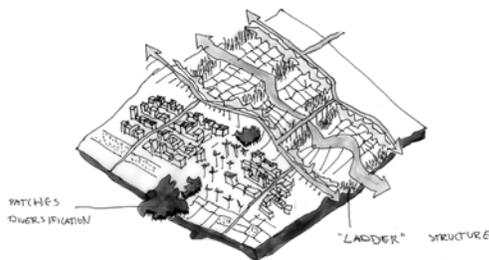
Figure 5. linking housing en infrastructure with an ecological 'ladder' along the river.
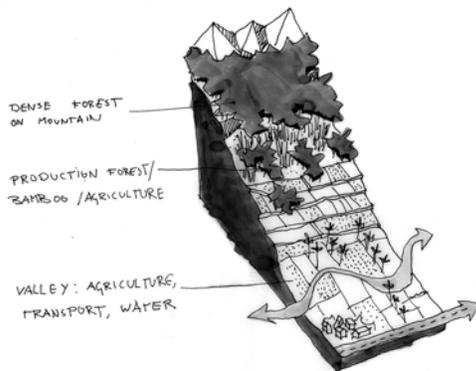

Figure 6. relating systems of agriculture, ecology and infrastructure to topography.

Mediating between scales, between top down imposition and bottom up initiative, this design also looks for common ground between the two initial theoretical strands. Postmetropolitan theory accepts small scale initiatives. These initiatives are however interpreted as fragments without structuring power. Theory of 'Everydayness'

accepts the presence of planned and imposed spatial production, but claims that real life is existing in the 'in between', and escapes the vision that is imposed from above. This design seeks a path to mediate between both and negotiates a specific balance, adapted to the situation in Hanoi. The strategic approach allows for a changing interpretation of place, for temporary uses and for unimagined appropriation. The metaphor of the 'ladder' as an incomplete, dysfunctional grid, is reinterpreted as a potent instrument to combine several significant layers into a synthesised plan. This superimposition leaves enough space for local, small scale initiative. A drawback to this approach is that part of the development of urban tissue is beyond control of the design method. In order to imagine production of urban tissue guided by the proposed structure, the design team had to revert to reproduction of existing methods. While infrastructure, water and vegetation were put forward, the built tissue would follow. To a large extent, this approach has let go of an architectural way of place making, while the built form also could be a vision of itself, combining local methods, techniques and culture to find more balance and completeness.

5. conclusion

Rethinking the city is a process that goes with a recalibration of design tactics and analysis. In a continuous process, both components redefine each other. A new paradigm for reading the city can adjust a design method, or even formulate a completely new approach. The investigating capacities, that lie in design tools, can unveil and remove errors and incompleteness. Design is a form of output that allows answers and results to become comparable even if different scientific inputs have been used to lay theoretical foundations for the project. It works in two ways. Primarily, it addresses the situation in Hanoi, it advocates a different approach to guide urbanisation in a rapidly developing region. It looks for qualities and latent structures, proposes methods and puts them to the test. Secondly, it discovers problems that cannot be solved within one paradigm and questions the completeness and correctness of theoretical frameworks. It also proposes spatial phenomena as examples of these flaws. In addition, the productive character of design looks for answers to merge and combine- to cross paradigms without diluting the discipline. Design, performed as *research by design,* therefore can be seen as a methodology that escapes the unproductive antitheses as enumerated above. From a positivist outlook, science only includes knowledge that is

derived from repeatable experiments that are established to explain existing phenomena. Design however, generating a product that is more projective, can also generate results that are open to analysis, exchange and dissemination. Grace to its explorative character, design can very well test current theories. By exposing gaps and lacunas, the methodology of research by design offers the proper analytical tools to reformulate scientific issues regarding spatial production and use.

This makes *place* a significant aspect of the research, as it is only in real situations that existing phenomena can be interpreted and incorporated into a project that covers both the practical and the theoretical aspect of the profession. Place can be researched from different interacting levels. A proper understanding of the larger scale leads, when researching by design, to a better implementation of the intermediate, the tangible and the modest. Smaller fragments of architecture, agriculture or nature are bound and defined. This does not mean that these elements are insignificant. Architecture defines the infrastructure in which daily life takes place, and is housed. These elements are however to be linked and understood beyond their own limits, within a larger framework.

Furthermore, the design is the arena in which an incommensurability can be resolved. Postmetropolitan theory has declared a crisis in architecture, as place making in the traditional sense, of shaping buildings and public spaces, no longer structures the city. It considers large scale landscape elements and infrastructure to be the generators of an urban comprehensibility. Theory of Everydayness has also declared a crisis in architecture, for as far as it cannot claim a materially makeable of society. Instead it focuses on spatial production and reinterpretation without an architect. Combining resilient structures with local spatial reproduction overcomes differences of both paradigms and exposes how a combination of multiple theories can be applied to read and address a rapidly urbanizing environment in a productive manner. Is this one of Kuhn's scientific revolutions? Maybe not yet, but as a first step, the research by design elaborates a site- specific approach to mediate between the fragment and the overview as it sharpens the undefined space in between them.