New Model for Contextualized Urban Design

An Effective Approach towards Modern Urbanism based on Studies of two Indonesian Cities

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Looking at the situation and results in most cities of Southeast Asia, there can be seen, that the approaches taken in urban planning are rather ineffective in this region[2], as they do not influence the development of these cities in acceptable ranges and scopes. The paper addresses these issue and shows an new perception of approaching urban design, which was derived through findings out of a PhD-research done in two Javanese Cities: Yogyakarta and Semarang. Note: the paper is considered to be read just as a summary and introduction towards the subject.[3]

Urban planning and the reality of city development:

Most cities of Southeast Asia face two problems concerning urban design:

a) Modern urban development is not much influenced by urban planning actions: Although most cities in this area do have planning instruments and modern regulations (mainly derived from Western standards: Zahnd, 2000) for directing the development of its cities, nevertheless in practice the processes and results of urban development quite often move in different directions as actually planned. This is true especially in Indonesia, where this problem has resulted into a 'laissez-faire' politic of urban management, where urban planning authorities more often just react than act, trying to keep with the flow of actual development within their cities.

b) Urban planning is focused too narrowly on certain areas and aspects in the city: Out of the problem mentioned above and the immense challenges for city development, the planning agencies concentrate mostly on certain areas and aspects of urban development. Again using the case of Indonesia, these means, the planning agencies (governmental and private) are more focused on big and prestige projects, leaving many areas of the city and many planning aspects unattached. The focus of urban design is mainly there, where investment and money flow occurs.

How to address these problems?

Mainly three approaches are being used for dealing with problems mentioned above:

a) Enforcing more rigid urban management: Urban authorities can establish and apply its agencies towards a tight and focussed urban management system, where all plans, goals and strategies for implementation of city development are applied in integrative ways by all actors.

b) Enforcing more urban policies, regulations and controls: Urban authorities can

introduce more urban policies, producing new regulations according to them and enforcing them through better control systems and tighter inspections. Ongoing controls and heavy penalties for not following the regulations are essential for the success of these policies.

c) Enforcing the redirection of the economic flow within city development: Urban authorities can redirect through different strategies some of the private investment into areas, which are commonly neglected by urban development, as most investments go to areas with the least urban population, but binds most of urban economic investments.

Taking a pragmatic approach with a different perception

Nevertheless for various reasons, the approaches mentioned above are not very realistic for being successful for the development of these cities, therefore they have to be questioned as valuable in that task. Basically in contexts like Indonesia, the actual development of the city areas are done by devolpers/investors who have often a very limited few for the overall city planning as they just are focussing on their projects. Additionally they face limitations and insufficiency within the existing static and komplex bureaucratic system of urban planning (Zahnd, 1999. p. 213). Looking at modern urban development, two pragmatic questions arise:

- What brings most (**for** the city)?
- What needs least (**from** the city)?

Without having to do a lot of research, one can see that what brings most is what affects the majority (people and land) in the cities. And improving good development of cities needs least effort, if it is successful involving the majority of actors by themselves towards that direction. Both of these aims are not an easy task. But to some extend many city governments like in Indonesia have already recognized this fact in relationship towards the *kampungs*, where an average of 60-70% of its city habitants live (Hanan 1996, p.19).

City planning experts in Indonesia realize more and more, that the general improvement of the city has strong relations to the condition and development of that vast areas. Therefore the reestablished[4] KIP (Kampung Improvement Program) has given already considerable contributions, as there is a certain level of direct involvement of its inhabitants.[5] But so far this focus looks only to existing vernacular urban settings. But still more lessons can be learnt[6] from this approach, if the setting of *kampungs* is not considered as backward orientated. Because urban kampungs contain important insights for the morphology and processes of designing and developing new and modern urban quarters.

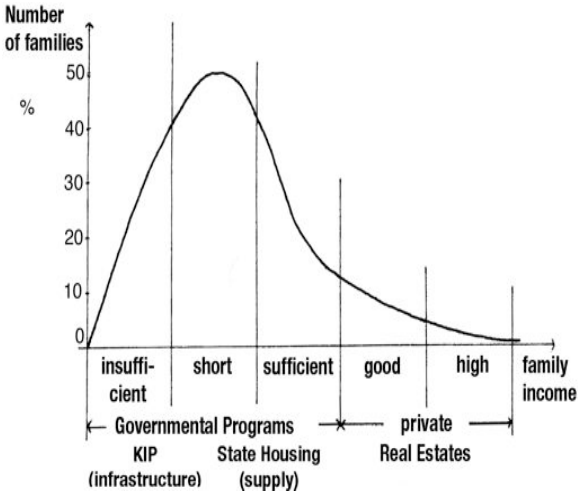

Figure 1: The range of city development in the case of Indonesia

Findings from the research

This paper presents findings from a re-

search, which looked specifically at the context of some specific vernacular settings. The research was focussed to learn, if there are any (yet hidden) insights, which can be derived from them, for designing new pattern for urban quarters, which are modern but yet contextual and sustainable. The crucial question for answering this thesis and question was finding an appropriate research base and applying a proper methology for receiving relevant empirical data (which has always to get limited to certain extend).[7]

As precedent was chosen the complexity of the historical urban development in Java, which is populated heavily with many big urban areas that have developed in multi-layered and superposed ways. Then focus was given on the four historical urban development in these cities, where out of the two types of cities in Indonesia (Santoso, 1984) two representatives from Central Java were chosen: Yogyakarta as Inland-City and Semarang as Coastal-City.

Within each of these two cities, in the study two types of quarters were chosen, that show opposite urban structures: the Chinese quarter (called Pecinan), which is basically focussed on extravert criteria (the grid of the bazaar street), and the Arabian quarter (called Kauman), which is basically focussed on introvert criteria (the cluster of the field). Different to many Mainland Asian countries they both together (yet in different ways) represent a strong binding of Southeast Asian urbanity with its roots in the 2nd layer, the (West- and East) Asian influence towards traditional urbanity in that region. A detailed analysis was presented in graphic and numeric displays about the quality and quantity of urban built features at macro (city) and micro (house) level. Then as a comparison the potential and problems of each area was addressed, and out of this, finally its general urban design principles for future were derived, that

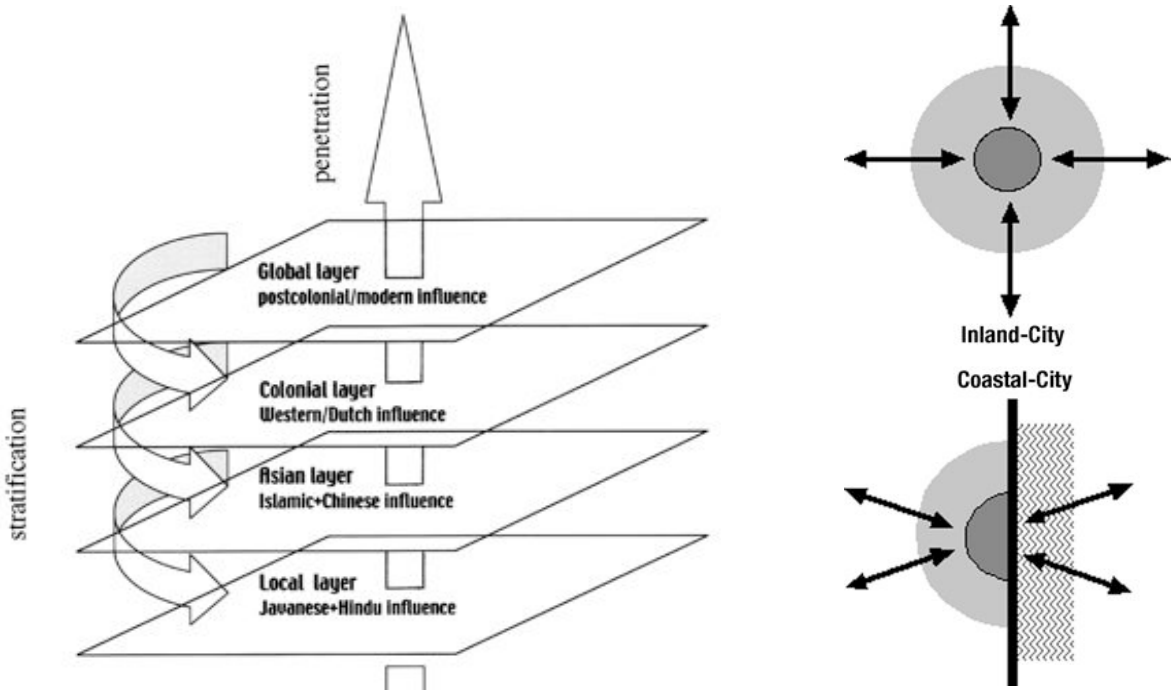

Figure 2: Left: Four layers of historical basic influence in Javanese cities. Right: The two types of Indonesian city.

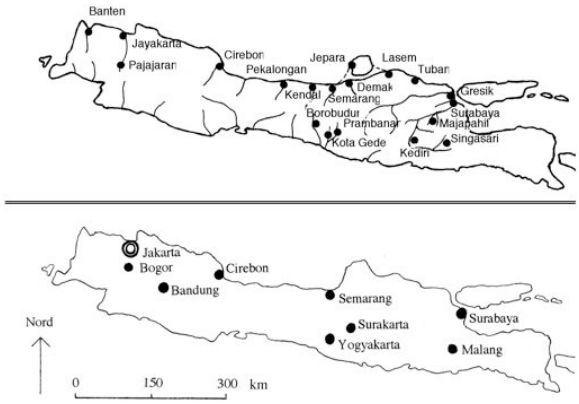

Figure 3: Ancient and modern Javanese cities

show relevance in modern urban design as a search for local identity and sustainability within global transformations.

The findings from this research are listed in condensable way[8] along the following criteria: solids, spaces, systems and values. They give insights, how and to which extend new modern quarters can be designed, following a competing approach of high dense but low rise morphology for new urban quarters.

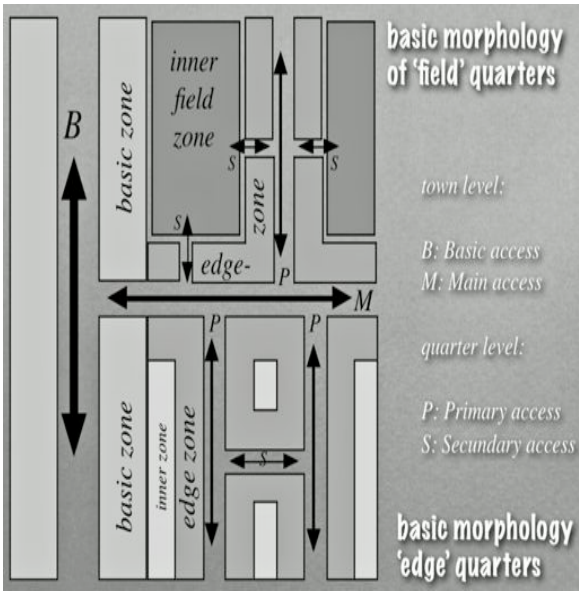

Figure 4: Two basic types of urban quarters

Urban Solids (Form)

- *Building structures:* Buildings alongside streets follow an organic grid[9], whereas buildings within the field follow clusters.

- *Building types:* Buildings alongside streets are just organized from front to back (following form and grid compatibility), whereas buildings in the fields show more complex types (block-, angular-, court-houses).

- *Building sizes:* Buildings along streets are usually bigger than buildings in the field. When there are big buildings in the fields, they are used mainly for special functions (like mosques, schools, etc)

- *Building hights*: The skyline of buildings in quarters have some kind of a 'bowl', where the hight very much relates to street priority: Along arterial urban streets most buildings have 6-8 floors, along collector streets most of them have not more than 4 floors, along local streets most of them have not more than 3 floors, where alongside environment streets most buildings have 2 floors. When there are higher buildings in certain spots than the average, there has to be a broader urban reason (functional, visual or structural) for this.

- *Building densities:* This criteria should be look at the overall base, where all streets are also included in the calculations[10]. In general a floor area ratio (FAR) above 1.5 has to get special attention. There is a possibility to get as high as 1.8, if all urban criteria have been considered positively. Areas close to streets, FAR can go as high as 5 (again including street segments attached to), if the overall urban criteria have been considered positively.[11]

Urban Solids (Function)

- *Public functions:* Alongside arterial streets all functions are public or semi-public and show a wide range of kinds. Alongside collector streets most buildings have a mix use, where the front and lower part has (semi-)public function. At some strategic

places, the whole of the buildings are used for public access. Alongside local streets, buildings with public functions are usually grouped together at strategic places. (Semi-)public functions in the fields appear, where there are is a need for little shops or public services.
- *Private functions:* Buildings alongside environmental streets and in fields are almost all used for private purposes (mainly housing). In some back- and upward parts of the buildings alongside collector streets and most back- and upward parts of the buildings alongside local streets are also used for private purposes (mainly housing).

Urban Spaces (Form)
- *Space structure:* Open space is structured mainly by a hierarchical system of streets, which is quite reticulated. Some of the public areas within the quarters show less linear space structures.
- *Space form*: The shape of urban spaces is articulated mainly through the close boundaries of its buildings, where the intersections to different hierarchical structures quite often are articulated. This increases the identity and hierarchical relationship of the whole area for its parts and as a whole. In some cases special space extensions are formed, where little courtyards are most prominent. Little public squares are seen mainly attached to public buildings. Some other little squares in the quarters seldom appear, except there is a multifunctional place to be used publicly.
- *Space size:* The size of urban spaces is usually very limited. Open space of some bigger size usually appears only in front of some representative buildings and institutions. Urban space sizes don't have a clear connection to the hight of buildings, except along streets according to their hierarchy.

Urban Spaces (Function)
- *Public functions:* Urban spaces quite often possess multi-functions, which go alongside each other or one after the other. Only arterial street-space is used mono-functional. All other street spaces are used up to 50% for parking and other functions. At strategic places, there has to be an availability for usage by the informal sector according to the functional hierarchy of the open space.
- *Private functions:* Open space for private access is only possible at closed open spaces. Otherwise open spaces better get functioned for public (multi-)use.

Urban Systems (Circulation)
Although the two aspects above (solids and spaces) also address systems, nevertheless two other systems are looked at especially as follows:
- *Pedestrian:* It is much more effective in the use of space, if some of the circulation system is designed especially for pedestrians alone. In some way this seems to be a contradiction to the statement below (see economic values). Therefore in practice this separation will only get achieved, if the entrances of these spaces do not allow cars to enter them. This separation of access can not be achieved by regulations (like signs), but has to be set through the physical layout and the shape of the entrances themselves. Only in this way it will be accepted for what it is for. The houses most far away from motorized access and parking spots should be closer than 150m, otherwise they loose lots of attraction.
- *Motorized:* Streets at with mixed functions (which means collector and local streets at some level) should be designed carefully as how their spaces should be used: motorized circulation, parking, informal selling,

pedestrian and greenery. The most effective way for this is to build arcades, which define a very attractive space of separation and transition at once: They protect the pedestrian from cars, motorcycles and also from the heat and rain. Arcades also bring people from the street to the shops, where they can walk more focussed towards the inside than the outside. From an economic point of view this is very attractive and by far compensates the loosing of that small spaces for private use, which at ground level the shops will have to set aside for circulation of people in that arcades.

Urban Systems (Infrastructure)

- *Social infrastructure*: Quarters with weak social infrastructures (for the community as well for its individuals) at various levels and distances (from neighborhood to city level) can never unfold their full potential as an urban quarter. Therefore appropriate social infrastructures have to be placed and designed (shapes and functions) carefully according to the needs of the setting.
- *Technical infrastructure:* Most of all, the proper supply of water, sanitation and drainage need careful consideration and planning as problems in these aspects will reduce the economic and social value of the area. Especially the potential and experiences of floods will affect heavily the status of the place.

Urban Values (Economic)

Alongside various aspects mentioned above, the following three major criteria are most influential (listed in hierarchical order) for the economic value of a place:

- *Accessibility:* The main influence of the economical value of a place has its public and mobile accessibility (at macro and micro level), because it determinates the range of potential functions (quantitative and qualitative) for a specific setting. The research showed that the economical value of land in general always doubles in relation to a higher street hierarchy. A plot gets also a double value, if it has direct access for cars. Therefore in practice, most investor and developer prefer urban design settings, where all plots have direct access to cars, not realizing, what there are other competitive options available[12].
- *Size of plots:* The second influence (although not that influential as the first one) has the size of the plot, especially in relations to its potential of unifying the plot with others into a bigger one. This dynamic can change completely the structure and functions of a whole quarter, therefore the design of plot structure and size has to be examined carefully in relations to the hierarchical order of the circulation system. The setting and dynamic of front and backyard plots needs special attention, too.
- *Functions of use:* The third aspect is the potential of the development of possible functions in a place. This criteria should not be looked at by a 'side by side' view, but rather by a 'one above the other' and 'one behind the other' view as this approach is much more realistic and effective for the application of urban criteria. Large areas of mono functions should be avoided, as a good balance of mixed functions raises the economic value of a place as a whole.

Urban Values (Social)

Although many modern investors and urban planner only consider economic value as the criteria for urban development, the research showed that there is much more to this. One of these crucial criteria relates to social values, as they influence much of the further development of a place, in

changing it from a place of technical investment/setting to a place of identification and belonging. This is critical for producing motivation for ongoing development.
- *Identity of community:* Although the sense and range of the identity as a community may vary, nevertheless the sense of belonging to a place and group in some kind is very strategic for most user in a certain place. Only if they get at least some of that sense, they are willing to sustain and develop their place. There has to be a strong awareness for planners in designing urban quarters, that the amount of all units is more than just the actual counting of its total numbers. Therefore designing appropriate centers of urbanity at all level is also a mayor criteria as they help to support this sense of common identity.
- *Identity of individuals:* The other aspect of social value is the focus towards the users as individuals, as they only will to do further private care, investment and work, if they see a future for themselves in that place. This has nothing to do with taking an individualistic approach for urban design as it is common in Western standards. But the personal needs of users in a place have carefully to be considered. This should not be done in an uniformed and egalitarian way. The research showed, that urban society is more complex and it functions in its differences in rather dualistic ways (e.g. rich-poor, static-dynamic, take-give, etc.) and often very close to each other. Especially urban planners trained by Western globalized standards do have many problems to see this typical Asian cultural setting as a potential for integration into modern urban design criteria. Many of them forget, that neglecting local urbanity is never a good solution for good urban development of its cities.

Urban Values (Symbolic)
This brings the urban design criteria to the last level of consideration: the symbolic values of a place. Many urban designer also neglect, that urbanity is not just material but immaterial too.
- *Morphological values:* Within the visible morphological setting of a new urban quarter, many invisible values are hidden. Which kind of image people (insiders and outsiders) have for/from a certain place will affect strongly the value, sustainability and development of that place.
- *Ritual values:* Urbanity within a place is also much influenced by the rituals, which will take place in it day by day. They can be profane and/or sacral, or they may take place every day and/or only at special occasions, and may be considered as casual and/or special. All these activities together express a deep sense of meaning within urbanity, given the user (inward and outward) stability and security as they often define the circle of everyday and everybody's life even in the context of modern urbanity. Therefore designing new urban areas also consider such facts as important in providing room for such kind of development.

Implementation of these findings into urban design processes

After all these criteria and aspects for designing new urban quarters, the question arises: How does this findings get applied into the process of the actual urban design and development? What has to be provided and which kind of appropriate design tools have to be made available for? - Sadly as a matter of fact many good research paper that present very relevant findings nevertheless end up unused and just being stored in some cupboards oder computer folders. Therefore it was part of

this research to look how its insights can be made available for people who don't take time to read and apply its findings into their own relevant context. For them a complete different approach was offered through the produciton of a new urban

Figure 5: tool box kit

model kit, in which many of these findings have already be included to be used now for further exploration and evaluation from students and lecturers of urban affairs, urban planners (private and government) and practitioner like architects.

Physical model for urban design

First of all, out of the academic model from the PhD-work, an actual physical model at a scale 1:1'000 was developed and produced, where users can build a city area up to 2 km^2 with 200'000 inhabitants. The model has already been tested in workshops and seminars with students from various study backgrounds, without given them much introduction to the task given, or expecting them to have already a lot of knowledge of the subject. The result were always very encouraging and for them even amazing, as they had not expected to shape such large quarters in such short time (just a few hours) with such high urban

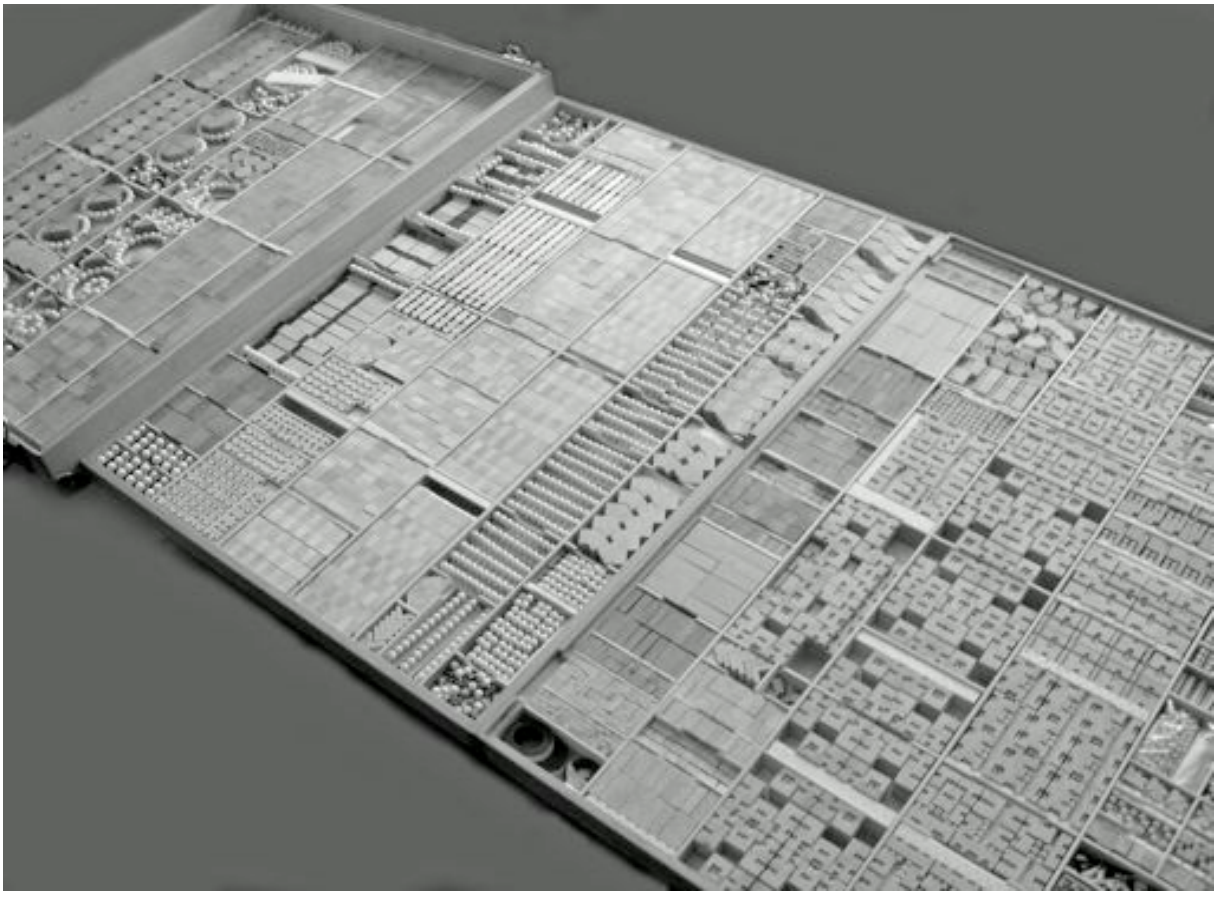

Figure 6: Some of the content of the box

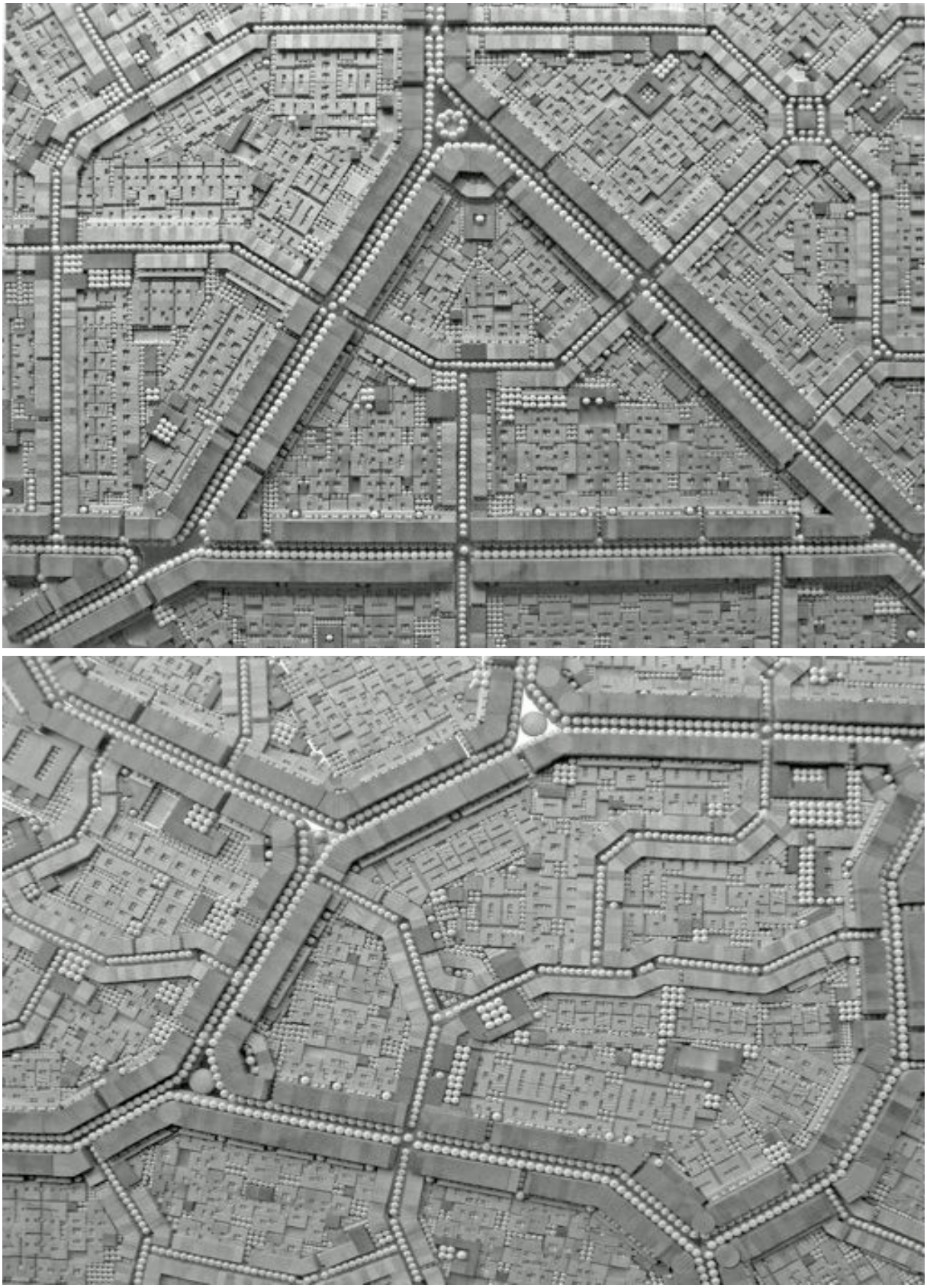

Figure 7: Lay-out of two examples

Figure 8: Students at work in groups, each one taking a plot of about 300x300m

qualities (despite many aspects in their design, which were not yet solved, of course).

Virtual model for urban design

Although the physical model is very attractive to be used for didactic and realistic experiments, it has considerable limitations too: a) There is only one set available, and b) There is no quantitative information to be derived from the actual design result of the model, except qualitative ones. But the quantitative information is important too, especially for making corrections and defining problems. Therefore out of this research a new virtual model has been produced. The new software is called [indosity] and works in some kind simular to the well know software-game SimCity, but in a professional urban design setting and more academic. Nevertheless some of the 'game-factor' is still applied, as this is a very strategic part of this approach, where users start at some low level of urban knowledge and then by their own interests bringing them by 'trial and error' methodology to more sophisticated levels.

Figure 9: Indosity software

The software has a graphic user interface (GUI), that allows developing models from basic to sophisticated levels as follows:

• First of all it offers a certain set of contextual building and space modules, which can be put together freely and easily without having to understand all criteria involved. This allows fast processes of designing new models.

• Second it offers automatically related statistical figures to all modules used in the actual model, without having to fill in manually all the coverage, ratio quantities and other urban data. This gives an easy and quick access to evaluation and simulation of quantities of the whole area within the model design.

• Thirdly it offers various properties and layers of urban criteria for each object, which can be contextualized and adjusted individually within the model. As a result every property of all modules involved in the model can be visualized and summarized easily as total entities (indicators and figures expressed in exact numbers of quantities, different color entities or localized exactly within the model as a whole in position and shape).

• Fourthly it offers the possibility to design new objects and groups from the given modules for experiments outside the given setting.

• Fiftly it offers to work collaboratively and simultaneously at the same project at several computers wherever they are placed (they may be in the same room or even be placed in another continent).

Over the last 2 years a team from Indonesia and Switzerland has developed the software. The most recent version can be downloaded[13] for free to be tested in university, professional or governmental settings. Testreports of anykind or suggestions for futher development and ideas are most welcomed! There is a precise conviction, that this new tool given into the hands of people dealing with affairs of designing modern urban quarters will make globally an important contribution for them. It may support them to fulfill the challenging task of creating more contextual and sustainable urbanity within Southeast Asia and even beyond.

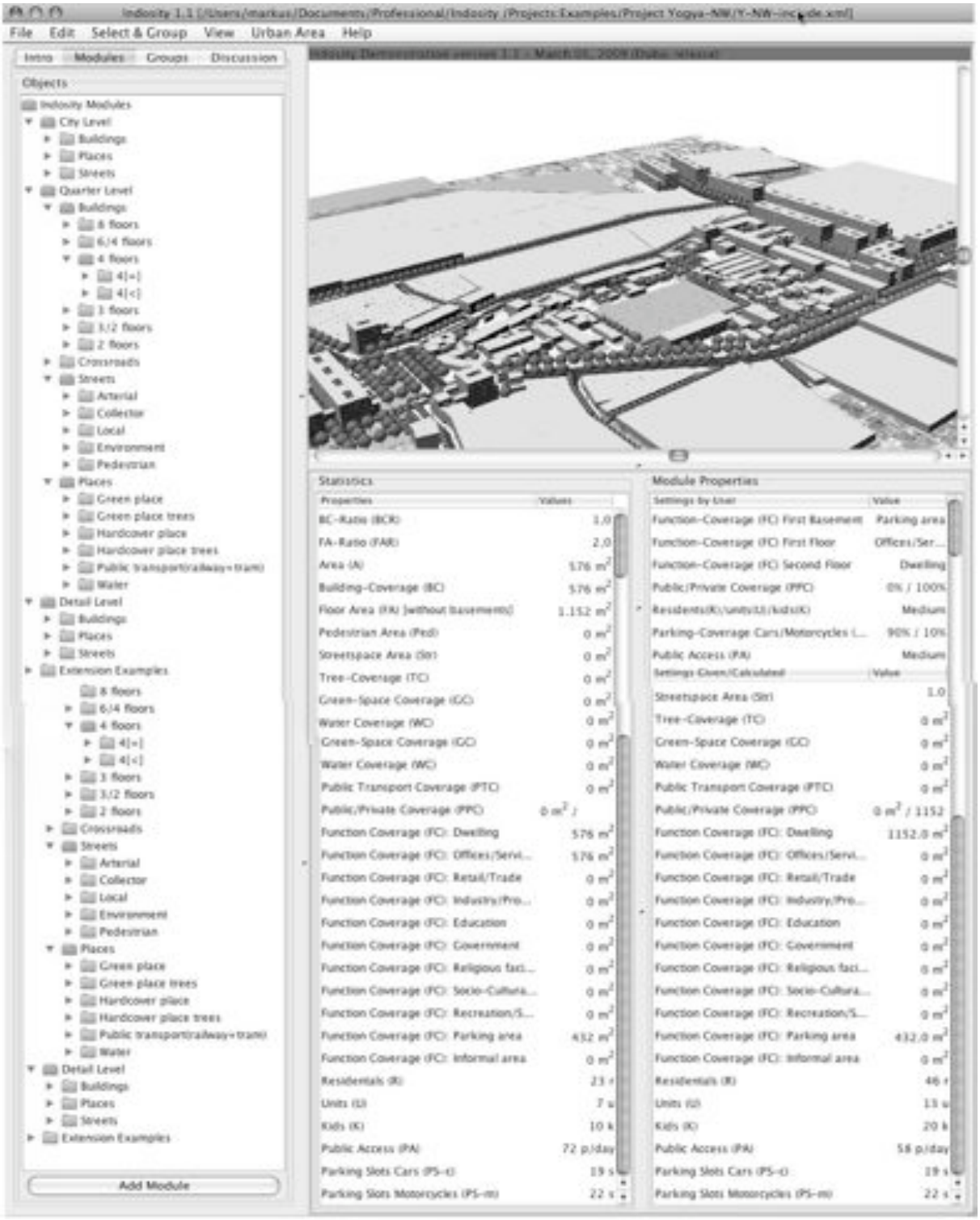

Figure 10: Graphical user interface (GUI) of [indosity]: redesign example of an area in Yogyakarta, Indonesia

Endnotes

[1] Although the paper was written at my time as Visiting Research Fellow at NUS in Singapore. For more information see http://web.me.com/m.zahnd

[2] One of the exceptions is Singapore, where state- and city-affairs work seeminglessly and forcefully together in achieving goals of urban development.

[3] For a detailled look at the methology of this research see: Zahnd, 2005; Zahnd 2008

[4] This was originally introduced by the colonial authorities during the thirties of last century.

[5] Although this has also led to some economic speculations, nevertheless the positive aspects of KIP has been proven as effecitve and an efficient use of limited financial resources.

[6] Many state government (like Malaysia and others) consider kampung-communities even as potentially dangerous for state development andd control, as their informal settings and activities show some 'independent' approach towards urban development. (Malaysia: Bunnel. 2002; Indonesia: Kusno. 2000). Despite of this situation more people and scholars realize, that there are important lessons to be learnt from kampung setting and environment (like e.g. Bunnel, 2002), and wellknown planners and architects also have already contributed important works for this discussion. (See: Holl, 1976; Correa, 1986; Vastu-Shilpa, 1990)

[7] For this research methology, see Zahnd, 2005; Zahnd 2007

[8] For more details and its related analytical links, see: Zahnd. 2005

[9] Organic grids (in opposition to technical grids) are not given in advance through the setting (e.g. by plot layout), but develop out of the functional building usage within their context. Nevertheless, quite often they use general patterns (e.g simular construction system) and as a result a grid system occurs.

[10] Usually FAR only covers plot areas, not including streets attached to. This makes sense for comparing plot data one with another. Nevertheless this kind of calculation doesn't give the actual density of the real urban contexts in the wider sense, as it is focused on plot data, not city data. Therefore, it quite often happens that e.g. plots with high rise buildings have a very high FAR, but if one is considering the broad streets and open public areas around them, the actual FAR of the whole context is much lower.

[11] The research showed, that if these limits have been excessed, then negative development (process of slum dynamics) within the quarter starts to occur.

[12] Cars also need quite a lot of valuable land within properties. There is proof, that this isn't always the best approach towards the economics of properties.

[13] For further information, illustrations, contact and free download: http://www.indosity.com

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