Community Participation
Critical Regionalism
High Rise Communities
Historical Preservation
Industrialisation
Mass Customisation
Progressive Change
Social Spaces
Traditional Shelters

In this issue:
Adnan, Ahmed, Al Haija, Aycı, Boyacıoğlu, Davidson, Daud, Dikmen, Elias-Ozkan, Gottsman, Hamzah, Lucas, Osman, Salas, Yun.
Aims

The Open House International Association (OHIA) aims to communicate, disseminate and exchange housing and planning information. The focus of this exchange is on tools, methods and processes which enable the various professional disciplines to understand the dynamics of housing and so contribute more effectively to it.

To achieve its aims, the OHIA organizes and co-ordinates a number of activities which include the publication of a quarterly journal, and, in the near future, an international seminar and an annual competition. The Association has the more general aim of seeking to improve the quality of built environment through encouraging a greater sharing of decision-making by ordinary people and to help develop the necessary institutional frameworks which will support the local initiatives of people in the building process.

Open House International

The journal of an association of institutes concerned with the quality of built environment. Theories, tools and practice with special emphasis on the local scale.

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Open House International is covered by EBSCO Publishing, USA and the Thomson ISI products: the Social Science Index (SSI) the Arts & Humanities Citation Index (A&HCI), Current Contents/Social& Behavioral Sciences, (CC/S&B) and the current Contents/Arts & Humanities, (CC/A&H).

The journal is also listed on the following Architectural Index lists: RIBA, ARCLIB, Avery and ELI index of periodicals. OHI is online for subscribers at www.openhouse-int.com
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ABSTRACT

With their socio-physical, socio-economic, socio-cultural, and sociopolitical presence cities and towns have always been highly differentiated spaces expressive of heterogeneity, diversity of activities, entertainment, excitement, and pleasure. Unveiling lessons learned on urban diversity this issue aims at providing a conceptualization of urban diversity and elaborating upon its underlying contents and mechanisms by exploring the variety of meanings adopted in the urban literature. It attempts to establish models for discerning urban space diversity while mapping such models on selected cases across different regions including Africa, Europe, and the Middle East.

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Editorial

The composition and subject balance of manuscripts in this Open Issue of OPEN HOUSE INTERNATIONAL range from experimental housing, through to mass customisation to Post-Disaster housing procurement methods and community oriented high rise building and Open Building. Starting with the Validity of PREVI, Lima, Peru, (p.6, Salas and Lucas, 2011) the focus is on an evaluation some forty years later after initial construction. Then on to Mass Customization of Housing, Malaysia, (p.16, 2011) for promoting customer satisfaction and contributing in the long run to sustainability of the housing industry. The overall conclusion was that there is a promising future for customised housing coming directly from prospective buyers. In both cases large scale industrialised operations are the key words BUT rather than huge three dimensional elements, the proposals opted for precast small elements on an industrial basis deployed in a rationalised construction philosophy thus allowing users to participate in the design and building process.

Manuscripts in this issue further develop community and participatory themes. Post-Disaster Housing Procurement Methods, Rural Turkey (p.28, Dikmen, Elias-Ozkan and Davidson, 2011) is shown by studies into two post earthquake renovation projects. Here insight is gained into a top-down strategy in Dinar 1995 and a bottom-up strategy in Cankiri 2000. Both these procurement methods are compared which highlight better ways of influencing future housing procurement processes after earthquake disasters.

In the case of Bukchon Hanoks, Seoul (p.40, Yun, 2011) successful examples of integrating modern facilities with traditional house forms are shown incorporating resident ideas and memories in the design process. In a similar way the ‘fareej’manuscript, (p.48, Ahmed, 2011) which by definition ‘fareej’ is the smallest unit in the residential urban context in the UAE, works towards ‘a community oriented design for high rise residential building in the UAE.

Running concurrently with this change and participatory theme in this ‘open’ issue of Open House International we move towards an Open Building approach for informal settlements in Mamelodi, South Africa (p.71, Gottsman and Osman, 2011). Founded on the idea that what is needed is a dynamic service core which leads to open ended, healthy and progressive building. There is clear evidence of an organic architecture always changing, always growing and avoiding the fixity and singularity of a finite designed product. Alienation in Jordan (p.83, Al Haija, 2011) comes round again not this time in the context of large scale mass housing but of government demolishment of rural villages due to lack of public services and lack of inhabitants. Given some resources the local community could focus their efforts to protect and rehabilitate their long established habitat and traditions. Villages become abandoned in spite of their considerable human and material potentialities.

The last article deals with two houses in the rural context in an Aegean village in Turkey (p.93, Ayci and Boyacioglu, 2011). But more than just and appraisal the article tries very successfully to link the design of two houses by Han Tumertekin to the local context at the same time “without denying the universally enlightening content of the modernist project”. This is the definition of critical regionalism.

Nicholas Wilkinson RIBA.

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THE VALIDITY OF PREVI, LIMA, PERU, FORTY YEARS ON.

Julián Salas and Patricia Lucas

Abstract

PREVI, Spanish initials for “experimental housing project”, was conceived in Lima in 1967. Among other initiatives, it launched an international architectural competition that led to the construction of a 500-unit compound based on proposals put forward by teams such as Atelier 5, Aldo van Eyck, and Higüez de Ozoño and Vázquez de Castro. The forty years that have lapsed in the interim and the ongoing transformation of the homes by their dwellers afford an opportunity to reflect on the suitability of the construction technologies proposed in the competition.

Ongoing growth and the rationalisation of construction methods were two of the basic premises underlying the competition. The remodelling that has taken place in the interim stands as proof of the success of the first premise, but the use of traditional techniques to build the additions calls some of the most sophisticated proposals for industrialisation into question.

At the time, the tendency was to rely on large-scale industrialisation, as can be seen in the German and Polish architects’ proposals. Nonetheless, many of the PREVI proposals opted for rationalising construction and precasting short series of small elements, rather than huge three-dimensional members. In the situation presently prevailing in Latin America, the viability of some of the technological proposals deployed in the PREVI might be profitably revisited.

Keywords: PREVI, housing, rationalisation, industrialisation, Latin America.

1. WHAT WAS PREVI IN 1970?

Contrary to practice in Europe, where urban construction must conform to a formal plan, in Latin America even today building is primarily an informal affair. The existence of any number of unplanned settlements, along with a wide variety of self-building practices, generate a social, technical and constructional context that cannot be ignored when proposing possible housing solutions that entail the use of low-cost industrial technologies. What options can industrialisation offer in domains where informal and planned construction co-exist? How does industrialisation respond in an environment where self-building is a highly likely occurrence? The PREVI (Spanish initials for “experimental housing project”) experience may shed some light on dwellers’ appreciation and interpretation of housing designed and built in Lima forty years ago. The fact that most of the proposals submitted to the competition were in fact implemented, along with the explicit recommendation in the specifications on the use of industrialised processes, have made the PREVI quarter a test bench from which conclusions can be drawn. Given the time that has lapsed (Figure 1) and user remodelling, the effectiveness of the various solutions devised for this competition for social housing in Latin America can now be assessed.

PREVI was conceived in 1967 by the Peruvian Government to improve the housing situation in Lima. It initially included three housing plans or programmes denominated pilot projects in the competition specifications, which pursued the objectives listed below.

- PP1 proposed the construction of a new quarter based on the proposals submitted in response to a competition with a dual scope: national and international. Peter Land, a British architect associated with the organisation, chose a series of foreign teams that would be invited to participate in this section, which included some of the most renowned architects of the time. More specifically, the short list included: Atelier 5 (Switzerland), Aldo van Eyck (Netherlands), Christopher Alexander (USA), Candilis, Josic and Woods
(France), José Luis Iñiguez de Ozoño and Vázquez de Castro (Spain), James Stirling (United Kingdom), Toivo Korhonen (Finland), Germán Samper (Colombia), Fumihiko Maki, Kionori Kikutake (Japan), Charles Correa (India), Herbert Ohl (Germany), Knud Svenssons (Denmark), Oskar Hansen and Svein Hatloy (Poland).

- PP2 formulated practical plans for renovating deteriorated housing.

- The objective in PP3 was to produce a design for low-cost self-built housing. The earthquake that razed Lima on 30 May 1970 prompted the division of PP3 into two programmes, one in accordance with the initial self-building premise and another, denominated PP4, that addressed earthquake-resistant issues.

The list of participants in the international section for PP1 included some of the most prominent members of what came to be known as the third generation of the modern movement. This group of architects, while beginning to question some of the axioms established in the early twentieth century, honoured many of the movement’s underlying intentions, as attested by their interest in the issue of social housing. Today, Charles Correa, one of the architects invited to compete in PREVI, observed that architects had been involved in social housing since the early twentieth century. He maintained that this was the engine that drove the modern movement, unleashing the concern, and the imagination, of architects such as Walter Gropius and Le Corbusier, who understood the exceptional relationship between housing and architecture. (García-Huidobro et al., 2008: 150).

This interest in housing, in conjunction with the environment prevailing in Peru, where cost and technology had to be carefully monitored, favoured the submission of a series of proposals that aimed to innovate construction methods. In fact, in the PREVI Operating Plan, explicit reference was made to these requirements in the description of the objectives pursued in PP1: Design and construction of a new urban settlement consisting of low-cost housing, with its respective public facilities and services, based on research in and development of new or existing design and technological solutions, with a view to enhancing the cost-effectiveness of the resources used and reduce direct construction expense (Barrionuevo et al., 1971 v. 1: 8).

These premises provided an incentive for submitting designs involving viable technological options in the technical and entrepreneurial circumstances prevailing at the time in Peru. The construction systems proposed, in which cutting edge...
sophistication, which would have been unthinkable in this environment, was ruled out, nonetheless aimed to rationalise and industrialise on site processes while lowering costs. These options were meant to provide solutions for a wide swathe of intermediate income families affected by housing shortages in Latin America. They were not geared to palliating extreme poverty or intended for emergency situations. Such needs were addressed more directly in PREVI plan PP3, which explicitly encouraged participants to work in these areas and to propose: a system of “lots and services” to accommodate migrant families and deedless occupants (on land taken over) with very low incomes (Barrionuevo et al., 1971 v. 1: 8).

PREVI was intended to be an opportunity to build viable and affordable solutions that could solve Latin America’s social housing problem. A broad sampling of the proposals for economic industrialisation in place in those years was tested. With the passing of time and the enlargements and informal construction processes undergone by PREVI housing, these industrialised systems can be assessed, not only for cost-effectiveness and durability, but also to determine which of the various solutions proved to be most flexible and adaptable for users, or which have co-existed most successfully with the changes made in this housing by its inhabitants.

2. WHAT IS PREVI TODAY?

The need for housing and the ambition with which the competition was established led to the materialisation of most of the international designs submitted (Figures 1 and 2). Around 20 units were awarded to each team. The jury’s final report [...] highlighted the importance of capitalising fully on the various ideas put forward by the national and international participants (Barrionuevo et al., 1971 v. 1: 16). This made the PREVI a test bench for construction techniques while generating an urban housing complex that is still in use today.

Today PREVI is one of Lima’s more peculiar quarters (Figure 1), grouping the different types of housing designed by the architects concerned. But far from disregarding the change taking place in the city, its dwellers have remodelled and enlarged their homes, completing them in keeping with their needs. This provides a measure of their acceptance of the PREVI designs and initial architectural solutions.

A review of the main changes affecting the quarter, compiled in a book bearing the eloquent title ¡El tiempo construye! (“time builds”) (García-
Huidobro et al., 2008), reveals the increase in residential density that has taken place in the urban fabric through successive enlargements on and additions to this housing (Figure 3). The nineteen sixties approach, which called for one or two storeys, has grown upward (Figures 4 and 5). Urban dynamics and the enlargements built by most of the inhabitants have generated a quarter with a predominance of three-or four-storey buildings used indistinctly for commercial or residential purposes (Figure 6).

The increase in building density, mixed usage and the pursuit of formal variety to break the serial monotony and individualise the housing are the most visible changes undergone by the PREVI designs. Use and time, through successive enlargements, have changed the design not only of each individual house, but of the urban group as a whole. Users have re-interpreted and modified the overall proposal. The question is whether the technological approach has suffered the same fate.

3. RATIONALISED CONSTRUCTION AND GROWTH OVER TIME

The specifications for the competition encouraged participants to present proposals that, through rationalised and technically suitable design, would lower costs and construction times with respect to conventional procedures. The preference for innovation was clear. But innovations also had to be adapted to the situation in Lima at the time, characterised by country-to-city migration and spontaneous suburban construction in the so-called young towns, informal settlements rising in the wake of the population overflow. As Peruvian anthropologist Matos Mar judiciously observed, The invasion of lands in the mountains is attendant upon mass invasions of urban property in the capital and major cities, giving rise to the inordinate growth of slums and shanty towns (Matos Mar, 2004: 36). One of the conditions laid down in PREVI was to assume that the dwellers, after receiving their homes, would undertake remodelling and improvements. The combination of an urge to innovate and the need to adapt to local realities spawned what are perhaps the two most visible lines of work in the PREVI competition: the commitment to rationalised construction and the acknowledgement of that the housing would grow with time.

3.1. Enlargeable housing

The pressure exerted by migration from the country to the city and the appearance of spontaneous, primarily self-built, settlements, was a clear indication that the users of the new housing would very likely enlarge their new homes with time. The inhabitants had already proven their construction skills in the informal sector. For that reason the teams participating in the competition were asked to provide not a finished product, but a structured process able to accommodate continued growth: The homes were to be designed for families with two to six children and the potential to expand to provide living space for up to approximately ten people in the future (Barrionuevo et al., 1971 v. 1: 15).

As early as 1968, then, PREVI was ques-
tioning the definition of housing as a finished product. The needs to be met and the assimilation of local circumstances led to proposals in which housing was viewed as an ongoing construction process able to adapt to the composition of the families who would both inhabit and remodel these units.

This situation was reinforced by the local family structure, which differs from the nuclear family for which European public housing is normally designed. This type of family organisation was favoured by the economics of the informal or “protest” sector. As Matos Mar wrote: Protest sector companies are predominantly family-run and this imbues them with a very peculiar identity. They are staffed by both the nuclear and the extended family (siblings, uncles and aunts, in-laws, cousins) (Matos Mar, 2004: 60). The structure of the extended family that prevailed among these residents generated a new type of home, which was neither an individual single family dwelling nor collective housing based on “horizontal” ownership, i.e., flats. García-Huidobro has called these apparently individual dwellings that in fact house different, generally inter-related nuclear families, multi-family homes (García-Huidobro et al., 2008: 137).

These extended families are more prone to the self-building that makes housing an enlargeable system. Indeed, recognition of this social reality has inspired some of the most significant proposals in Latin American housing. This view of homes as seeds, enlargeable and improvable over time, can be detected, albeit with shades of difference, in Mexican architect Carlos González Lobo’s (González Lobo, 1999) Gran Galpón system, Chilean Alejandro Aravena’s proposals or the works erected by an Argentinean group, CEVE.

While the remodelling that has lent PREVI its current appearance has completely erased the lines of many of the original architectural proposals, it is also indicative of the popular success of homes able to meet the need to grow. As predicted, the homes have been enlarged. The question now is how this was done, taking account on the one hand of the changes to which the housing has been subjected and on the other of the construction techniques used in such enlargements.

3.2. Rationalised construction

The specifications for the competition called not only for design flexibility, but also incentivised the use of technologies that would adapt to change. All the housing designs and construction technologies must be flexible and envisage progressive (horizontal and/or vertical) growth to suit the dynamic and changing social, cultural and economic characteristics of the families forming the community (Barrionuevo et al., 1971 v. 1: 15).
The intention to improve the construction process opened the door to the industrialised techniques in use at the time in Europe. But those techniques had to be tweaked to accommodate the flexibility required to adapt to the technical realities prevailing in Peru.

From the nineteen fifties through the seventies, industrialisation in Europe's most technologically advanced countries underwent a boom period of mass euphoria: Systems based on large panels predominated in so-called Eastern Europe and were quantitatively significant in European Union countries. (Salas, 2000: 33). Some of the international designs submitted to PREVI exuded confidence in large-scale industrialisation. The Polish and German proposals purported to transfer construction practices developed and used in those countries to Lima.

This was not the most common technological approach adopted by the participants in the competition, however. Around 1970 a new stage of industrialised construction appeared in Europe. The oil crisis, the reduction of the mean size of buildings and the growing proportion of single family homes led to a period of “crisis and perplexity” (Salas, 2000: 35). It was then that the rigidity and adaptability of large-scale systems began to be called into question for developments that did not involve an especially large number of units. It was also around this time when the first so-called “compatible elements” began to appear.

### Table 1. The three PREVI-PP1 technological families

| Classification of construction systems proposed by PREVI-PP1 international teams: |
| Description of construction systems (further to ININVI, 1988) |
| **LARGE- OR MEDIUM-SCALE PRECASTING** (Figures 7 and 8) |
| - Herbert Ohl (Germany): large-scale precasting of large, three-dimensional members |
| - Oskar Hansen and Svein Halloy (Poland): medium-scale precasting |
| - James Stirling (United Kingdom): on-site precasting of sandwich panels |
| **LIGHTWEIGHT PRECASTING OR RATIONALISED CONSTRUCTION** (Figures 9 and 10) |
| - Atelier 5 (Switzerland): Lightweight panels precast on site and used as permanent formwork |
| - Ignacio de Osono and Vázquez de Castro (Spain): Tabibloc: concrete block system used as permanent formwork and that in practice defined the layout of each home or unit |
| - Christopher Alexander (USA): panels and joists precast on site |
| - Knud Svenssons (Denmark): cast-in-place concrete with modular steel formwork |
| **RATIONALISED MASONRY** (Figures 11 and 12) |
| - Candilis, Josic and Woods (France): reinforced masonry and precast joists in structural floors |
| - Germán Samper (Colombia): reinforced masonry and lightweight concrete in structural floors |
| - Aldo van Eyck (Netherlands): reinforced masonry and hollow concrete modules in structural floors |
| - Kikutake, Maki, Noraki and Kurokawa (Japan): reinforced masonry and concrete blocks |
| - Charles Correa (India): concrete block-based reinforced masonry |
| - Toivo Korttinen (Finland): concrete block-based reinforced masonry |

The criticism levelled against large-scale precasting in Europe in the nineteen seventies, together with the peculiarities of Peruvian needs, led several participants to propose rationalised, rather than industrial, systems. This was the approach adopted by the Spanish team, with its Tabibloc proposal (Figures 9 and 10) (Vázquez de Castro, 1981) or the Swiss Atelier 5’s proposal to build lightweight panels on site. Other teams, headed by Colombian architects Esquerra, Saenz, Urdaneta and Samper and the Dutch architect Aldo van Eyck (Figures 11 and 12), proposed systems that rationalised conventional techniques by using modular concrete blocks to build reinforced masonry walls. In both cases, the idea was to test techniques that would improve traditional construction procedures with no need to export technologies to Peru that would be unsuited to the realities of its capital city.

### 4. THE PP1-PREVI INDUSTRIALISED PROPOSALS

#### 4.1. Analytical sketch of the three construction families

The commitment to innovation that characterised the competition constituted a specific premise underlying the building of the so-called experimental neighbourhood, the complex resulting from the materialisation of the PREVI-PP1 proposals: The
objectives sought were to adapt and implement the experimental construction systems proposed by the participants, develop new modular materials for conventional systems, improve existing practices and methods, design and experiment with new solutions for building services and establish a comprehensive approach to indoor facilities (Barrionuevo et al., 1971 v. 1: 19).

A brief review of the proposals for industrialisation put forward in the original PP1 designs reveals that although the construction solutions varied widely they can be grouped into three families (Table 1). These would include designs based on large-scale, Europe-like industrialisation (Figures 7 and 8), others opting for rationalised masonry (Figures 11 and 12) and a third group that explored a promising intermediate approach in which rationalised procedures were combined with more or less industrialised lightweight elements produced in small on-site plants (Figures 9 and 10).

One of PREVI’s research objectives was to explore precast systems applicable to social housing. Jacques Crousse, a Peruvian architect who participated in the national section of the competition, now says in this regard: At the time, large-scale precasting was thought to be a promising system for mass construction intended to meet the enormous demand for housing both in the Third World and post-war Europe. [...] An additional problem was the difficulty of providing an open system, i.e., one in which housing could evolve over time. [...] We found this ambitious project to be both realistic and feasible (García-Huidobro et al., 2008: 152).

The PREVI design that best exemplified European large-scale industrialisation, submitted by Herbert Ohl’s German team (Figures 7 and 8), was described as follows: The construction system proposed consists of overlapping large, mechanically joined (with bolts or pins) reinforced concrete modules or frames measuring 7.20 m long, 3 m high and 1.20 m wide. Each one weighs 6 t and is precast in steel moulds in a plant located near the worksite. They are assembled on site with a special bridge crane on wheels for mobility (ININVI, 1988: 20). This team also proposed building a spiral stairway with three-dimensional precast elements.

As may be deduced from the German proposal, PREVI was instituted at a time when large-scale industrialisation was still regarded to be a technological panacea in the “North”. But the need to provide for adaptations prompted some participants to opt for what is known as rationalised masonry, i.e., organisational improvements on traditional, labour-intensive techniques. Others proposed small-scale precasting systems or methods to rationalise small elements, short series of which could be produced on site in some cases.

One such rationalised construction approach was adopted by Tabibloc, the proposal submitted by the Spanish team headed by Íñiguez de Ozoño and Vázquez de Castro (Figures 9 and 10): The construction system consists of confined masonry that uses specially designed concrete
blocks, Tabiblocs. Each block has four partitions forming three internal openings, the one in the centre to be filled with mortar, constituting an acoustic barrier, and the two side openings to be left empty for thermal insulation. Tabiblocs come in 18 shapes for use in intersections, abutments and joints. In all cases they constitute permanent formwork (ININVI, 1988: 23).

The proposal put forward by Aldo van Eyck’s Dutch team, while similar, was closer to what is known as rationalised masonry (Figures 11 and 12). The construction system uses concrete and steel as the basic materials. It consists of reinforced masonry walls built with modular concrete blocks. The roof is made of hollow reinforced concrete modules that span the distance between walls or beams. The result, in short, is a lightweight precast construction system (ININVI, 1988: 25).

4.2. PREVI contributions and transfer of the resulting technology

The successive remodelling of PREVI housing can be used as a basis for assessing the actual viability and constructional interpretation of these proposals for industrialisation and their possible transfer to other areas of Latin America. Several approaches involved rationalisation and small-scale precasting, some of which was conducted on site. In addition to adaptation to local realities, these construction solutions were viewed as a possible industrial incubator for the area’s business fabric.

Despite the 40 years that have lapsed, however, during which incremental construction has been ongoing, scantly any trace can be found of the assimilation of these technological proposals by the local business fabric. Most of the enlargements were built with wholly traditional techniques. Does this mean that no one capitalised on the technological innovations introduced by PREVI? While these techniques appeared not to have taken root in the local market, relationships can be detected between PREVI technological proposals and construction procedures in place in other areas of Latin America.

The Sandino (Cuba), block-panel (Costa Rica), Servivienda (Colombia) and Sancocho (Cuba) systems (Lorenzo Gálligo, 2005), based on the rationalised precasting of small elements, can all be classified in the same construction family as some of the PREVI systems. The industrial kernel that PREVI attempted to plant in its day would appear to continue to be a technological seedling that is still attempting to develop in Latin America. The technological realities of the marketplace seem to be moving in other directions, however.

5. CONCLUSIONS

Forty years after the implementation of the PREVI proposals, a number of conclusions can be drawn in connection with the competition itself and the
construction technology it inspired. The results of these technologies can also be assessed with a view to analysing their possible validity for new housing construction in Latin America.

The first item to be assessed is the approach adopted by PREVI itself in terms of its two basic premises: growth over time and rationalised construction. The wisdom shown by the competition organisers in connection with the first of these premises is visible in the mention in the specifications to what was, and continues to be, a typical situation in Latin America. Up-scoring the inclusion of the potential for enlargement and inviting the short-listed architects to address this possibility contributed largely to their submission of housing designs geared to healthful growth, avoiding, for instance, undesirable consequences such as the existence of poorly illuminated and poorly ventilated rooms.

The competition also successfully promoted technical innovation by favouring rationalised construction and small-scale precasting techniques. This call for innovation, in conjunction with a demand for flexibility, led Vázquez de Castro and Ozoña, Samper, van Eyck and Atelier 5 to present proposals that involved an intermediate degree of industrialisation. These architects proposed improving construction process organisation and producing short series of elements in small labour-intensive, equipment-light production plants, some located directly on site (Salas, 2000). This intermediate approach between imported industrialisation and traditional construction even today appears to be one of the most suitable solutions for Latin America.

It is no coincidence that the teams from technologically developed countries such as Germany, Poland and the United Kingdom submitted precast solutions for large-scale members. Another conclusion that can be drawn from PREVI is the direct relationship between technology and the social and economic situation prevailing where it is to be used, the technological genes, to use the term coined by K. Reddy (Reddy, 1998: 27).

In as much as such conditions are not readily exportable, particular attention must be paid...
to evaluating technical capabilities at the actual worksite, especially where cooperation projects are involved. Precast members whose weight or volume precludes their handling by local workers or simple locally available machinery would not appear to be a viable solution. The sole way that such an approach would be feasible would be for the country of origin to export patents and equipment to the host, heightening the latter nation’s technological, and hence economic, dependence.

Forty years later, the PREVI poses yet another paradox. Although its implementation ushered in innovative technologies and the housing was designed for future enlargement, subsequent construction has involved primarily traditional techniques. The political determination that drove the initial proposal did not last long enough to promote industrialised building or access to its products. Indeed, PREVI blocks are among the few components that are still being manufactured in Peru today. A modified version (affecting its form and production process) of the Tabibloc proposed by Ibáñez de Ozoño and Vázquez de Castro has been used in a number of projects in Spain, however. While PREVI design and development constituted an industrial laboratory, then, its findings have apparently failed to take root in residential construction in Lima.

The adaptability of the small-scale industrialisation and rationalised construction systems introduced in the wake of the PREVI proposals can be assessed very favourably. In light of the changes made in the designs, however, and the realisation that they were the result of the use of traditional techniques, the question that should now be posed is why such technologies failed to take root in the local industrial fabric.

The authors wish to expressly thank Peruvian engineer Raquel Barrionuevo, who participated actively in PREVI as a member of the building team, for the invaluable information she provided and for her generous cooperation in this study.

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EXAMINING THE POTENTIAL FOR MASS CUSTOMISATION OF HOUSING IN MALAYSIA

Md. Nasir Daud, Hasniyati Hamzah and Yasmin Mohd Adnan

Abstract

In housing, mass customisation is increasingly seen as a useful innovation for promoting customer satisfaction and thus for contributing to the long-run sustainability of the housing industry. A major stimulus has been the escalation in competition among housing developers in response to the increase in housing consumers’ want for individuality in their purchased properties. However, in the absence of confirmatory evidence, the presumed consumers’ want for individuality has remained only as a perception until now. In quest for the evidence, an empirical investigation was conducted recently through a questionnaire survey that involved housing consumers, both existing owners and prospective purchasers, in four centres of population across Peninsular Malaysia. This paper presents the findings from the survey. The evidence that was found supports the conclusion that mass customised housing is very much a way forward in Malaysia. The findings show that while buyers’ dissatisfaction with current developer-delivered housing has led to a desire or preference towards customised house, buyers’ satisfaction with existing situation has not weakened the desire. In the context of Malaysia, this study is important to the development of mass customised housing since it has examined market readiness on the demand side, one of the critical criteria for the concept to be successful in the country.

Keywords: Mass customisation, housing, Malaysia

INTRODUCTION

As housing consumerism grows in sophistication with prospective buyers becoming more discriminating and discerning due to improved information and communication technologies, housing developers increasingly have to re-assess their supply response to the market. Already the situation has resulted in developers’ implementation of certain innovations as they embrace the challenges of competition in the market. To drive customer satisfaction, a growing practice has been seen among housing developers to accommodate requests from individual house buyers for incorporating a degree of design variations from the standard while the construction is being done. An industry-wide adoption of such practice will contribute positively to wastage elimination since pre-occupancy works such as extension, re-tiling and layout alterations that invariably entail some wastage of materials can be avoided.

There have been renewed interests in design and layout flexibilities as evident from their implementation successes, albeit in varying degrees, in the UK, USA, Japan, Taiwan, Netherlands and more recently China. A particular innovation in the design and process within the housing industry is the Mass Customisation, a concept that is closely aligned to the goal of enhancing customer satisfaction and thus of ensuring sustainability in the long run. As highlighted by Hart and Taylor (1996), mass customisation involves ‘the use of flexible processes and organisational structures to produce varied and often individually customised products and services at the price of standardised, mass produced alternatives’. It operates on the basis that producers or providers of goods and services could capture more market share by delivering customised products on a mass basis. In other words, mass customisation is the capability of producers to offer personalised products, each product tailored to customers’ requirements, on a large scale. The argument is that customers, while seeking some basic standards, also want ‘some individual recog-
tion and custom treatment’ at the same time (Lovelock, 1988). Thus, mass customisation offers a competitive approach to challenging the more traditional strategies such as mass production. This customer-centric approach, selling lifestyle and fantasy, has featured strongly as the marketing strategy for myriad categories such as apparel, construction and home furnishings, computers, sports equipment, publishing and printing and balloons (Zipkin, 2001).

An earlier paper investigated the notion of housing mass customisation together with its perceived implications in Malaysian context (Hamzah et al, 2010). Following that, the current paper reports the findings from an empirical study that has been undertaken to examine the state of market readiness towards mass customised housing. There are two major parts to this paper. The first part synthesises literature related to the study whilst the second part presents the analysis of the data to report on whether or not empirical evidence exists to support the conclusion of demand for mass housing customisation concept. In the context of the latter, it is possible to distinguish the two types of data that has been examined: the first relates to respondents’ perceptions based on their responses with regard to their system of preferences, and the second is based on documenting house buyers’ actual choices of action when it comes to undertaking renovation works.

THE LITERATURE

Central to the evolution of mass customisation in businesses have been the increased competition and the drive to win customer loyalty via customer satisfaction i.e. customer focus. According to Zipkin (2001), the main enablers to mass customisation are elicitation, process flexibility and logistics. Elicitation entails the decision and communication of customer preference to the producer, aided by customer-relationship management (CRM) and automation (IT-based) (Zipkin, 2001). Process flexibility translates the information into physical product in high-volume. Pine and Gilmore (1998) argues that flexibility in both processes and organisational structures is pivotal to the successful implementation of mass customisation; it is what distinguishes mass customisation from mass production. Closely related to mass production, flexibility in production has been enhanced by innovations such as modular design, lean operations and digital-IT. Finally, logistics is the stage whereby products manufactured according to individual customer’s preferences are delivered to the correct customer.

Lampel and Mintzberg (1996) outline the spectrum of design and logistic strategies between pure standardisation and pure customisation in terms of what each feature is characterised by at each step along the way. Further, Pine et al (1993)’s “product-process change matrix” divided into four the stages in which organisations can operate, namely invention, mass production, continuous improvement and mass customisation. It could thus be argued that mass customisation should come as a natural progression in the housing sector where technological innovations have been continuously experienced.

The implementation of housing mass customisation in developed economies has been widely discussed in literature. For instance, Barlow and Ozaki (2001) highlighted possible demand and supply side barriers to mass customisation in the UK which has been adopted since the late 1990s encompassing building design and service packages. Among factors mentioned are local authority’s rigid planning and design guidelines and mortgage lenders’ apprehension about how innovative designs could affect future marketability of the property. In the US, Larson et al (2004) report that mass customised housing found ready converts among the sophisticated “baby boomer” generation. As a result, cutting edge technologies have been developed in the country to cater for this demand. An example is the MIT’s automated design tools (ADT) that facilitate agile and customisable architectural systems and strategies which are supported by the current building technology. In Japan, the discerning Japanese home-buyer with highly personalised taste has rejected uniformity (Barlow and Ozaki, 2003). The first mass customisation system - Sekisui Heim M1 - accepted user control while also harnessing industrial production. Van Gassel (2002) provides an insight into the success of mass customisation in the Netherlands which is attributable to good institutional support, particularly in terms of the govern-
ment subsidies for industrial, flexible and demountable building (IFD) pilot projects (Van Gassel, 2002). A Dutch case study was provided by Cuperus (2003) to signify how the availability of Open Building and Lean Construction in the construction industry may contribute to the achievement of mass customisation goals. In Taiwan, a business strategy called ‘pre-sale’ has dominated the housing market especially in metropolitan areas, entailing an open dialogue between customers and the builder to achieve a common agreement on the design, cost and quality as a strategy to ensure customer satisfaction (Lai et al., 2004). During this stage, the builder is amenable to accommodating buyers’ input – albeit within the scope of possibility – while building has not entered physical construction.

As is typical in many cities across Asia, the conventional housing market’s delivery of standardised products in Malaysia has the recognised incapacity to live up to individual purchasers’ exact wants, with the purchasers often ending up making alterations to their properties as exemplified in Figures 1, 2, 3 and 4. This presents a significant challenge for which, as the market grows in maturity, the introduction of innovative solutions via mass customisation is welcome. The Taiwan case raises an important issue with regard to the soundness of buyer decision-making process in a housing market offering mass customisation and buyers lack information and professional knowledge on a virtual building carrying myriad customisation possibilities. A partial solution is provided by the information technology, for instance a hybrid approach combining case-based reasoning (CBR) and genetic algorithm (GA) (Juan et al., 2006). With the increasing demand for housing customisation, suppliers bear the responsibility to offer customers customisable housing units, as well as to satisfy their needs and expectations within a preferred budget.

Another catalyst to mass customisation is advancement in building technology. The
Industrialised Building System (IBS) describes the construction technology in which all building components such as wall, slab, beam, column and staircase are mass produced either in factory or at site factory under strict quality control and minimal wet site activities (Lim, 2006). Arguably, this system acts as a catalyst for mass production in construction. To further boost the industrialisation of the construction sector, manufacturing concepts are adopted including the Lean Construction originating from the car manufacturing industry aiming at reducing waste from design to delivery (Cuperus, 2003). The Open Building concept is also introduced whereby building occupiers determine specifications that best suit their needs, thereby creating the conduciveness for responsibility and care.

The discussion of the literature above has however, through its emphasis on the production aspect, addressed mainly the supply side of mass customisation. An equally, and perhaps even more critical aspect is the demand side which needs to be assessed for an indication of the potential market reception to the concept. While performing the assessment may not be altogether straightforward, a considered approach is to study the prospective buyers in terms of their house-buying preferences and to examine actual buyers of standard mass produced housing units in terms of both their satisfaction on the delivered units and their subsequent actions on renovation. Examining the respondents’ responses and preferences will provide an understanding of the demand side behaviour and will allow certain perspectives to be gained with regard to the potential of mass customisation in Malaysia.

COLLECTING THE EVIDENCE

As enumerated earlier, the concept of housing mass customisation is new to Malaysia. A comprehensive work on the potential of mass customisation would require an examination of both the demand and supply sides. The current study is useful in that it provides the starting point to the work. The prime motivation is that no data currently exists in relation to how ready consumers are for how housing mass customisation although such data is important to the housing industry.

A questionnaire survey was adopted. Given that the main objective is to examine consumer readiness towards mass customised housing, the survey was designed with housing consumers as its target aiming to achieve a reasonable mix of owners and non-owners of property in the sample. The rationale for this approach is the consideration that both the owners and non-owners can provide useful indications concerning the desirability of mass customised housing from a prospective buyer’s point of view, while the owners can additionally provide indications of the satisfaction from the perspective of the purchaser who has actually taken delivery of developer’s standard house. In this manner, the data can allow the issue to be examined from two different perspectives with the added benefit that the comparison could lead to further insight. For sampling, a systematic procedure had been adopted while the stock of double-storey houses was taken as the sampling frame. Because systematic sampling had been used, the proportions for owners and non-owners had not been made to conform to certain a priori values but were instead allowed to follow the results of the random process that emanated from the procedure. Double-storey houses had been adopted as the sampling frame because this particular housing sector represents the largest inventory of mass-produced houses in the country in line with its popularity among house buyers.

For the purpose of the sampling, the Peninsular Malaysia was divided into eastern and western regions. This way of dividing up the peninsula is not only geographic but also serves the demographic and economic reasons well. The two regions are differentiated on their economic dynamism with the latter showing generally more progressive and dynamic growths than the latter. In terms of the demography, the eastern region is more biased towards the Malay populace while the western region has a generally more balanced racial composition.

To achieve the aim of this study, respondent samples were to be drawn from localities that would reflect the house buying population in each region. Based on this consideration, the cities of Kota Bharu and Kuala Trengganu had been chosen to represent the eastern region while Shah Alam and Kemuning the western region. A sample of 120 respondents was targeted for from each locality.
and was subsequently drawn according to the sampling procedure mentioned earlier. The questionnaire had three main sections. Section One was to capture the basic socio-economic information of every respondent with section two to capture house buyers’ attitudes and reactions in relation to their purchase of developers’ mass produced house, while section three was to identify the extent to which the idea of mass-customised housing has its appeal among prospective purchasers.

THE EMPIRICAL ANALYSIS AND FINDINGS

First, the profiles of the respondent samples were examined. Result details are described in Appendix A. Given that systematic sampling has no control on proportions of instances within any particular attribute, variations in the racial composition were found across the different samples. Nevertheless, the compositions bear reasonable correspondence to that of the actual population in the localities where the samples were drawn from. The predominance of the Malays was evident in all the samples. In the cases of Kota Bharu and Kuala Trengganu, this merely underscores the demographic bias of the eastern region towards the Malays. However, for Shah Alam and Kemuning where a similar condition does not apply, the situation can be explained in terms of the socio-political factors underlying the greater magnetism of these two centres of population among the Malays.

In terms of the gender, all samples achieved a fairly balanced mix of the sexes across the different races with an overall male to female ratio of 57:43. An exception was Kemuning where the Chinese showed high skewness towards the male sex while the Indian had only one respondent, a female. Again, this is an effect that flows directly from the use of systematic sampling procedure but one which we do not consider to affect fundamentally the validity of the analysis. In terms of age, the modal age group was 30 - 40 years for all the areas except Shah Alam where the mode was 30 years and below. In Shah Alam, only 12% of the respondents in its modal age groups were owners compared to 42% for Kota Bharu, 39% for Kuala Trengganu and 76% in Kemuning; within the 30 - 40 year category, Shah Alam’s proportion of owners was 51%. Table 1 depicts the age profile of the respondents.

To indicate their employment background, respondents were asked to choose from a range of employment categories listed in the questionnaire. In Kota Bharu, 42% of the respondents fell under the two top employment categories - the professional and management. The varying percentages across the different locations (40% for Kuala Trengganu, 63% for Shah Alam and 74% for Kemuning) showed that employment structures vary between the cities with cities in the western region having higher proportions of higher paid jobs than those in the eastern region. In fact, Kuala Trengganu had the administrative or clerical category (a lower position in the employment ladder) as the modal employment group.

Owners were asked to rate their level of satisfaction, based on Likert scaling of 1 to 5, with regard to their purchased developers’ units. Using mean as the measure of central tendency, statistics were computed for the scores. For Kota Bharu, the

<table>
<thead>
<tr>
<th>Location</th>
<th>Location</th>
<th>Age group</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Location</td>
<td>&lt; 30</td>
<td>30 - 40</td>
</tr>
<tr>
<td>Kota Bharu</td>
<td>Location</td>
<td>88%</td>
<td>58%</td>
</tr>
<tr>
<td>Owner</td>
<td>Location</td>
<td>13%</td>
<td>42%</td>
</tr>
<tr>
<td>Total sample</td>
<td>Location</td>
<td>24</td>
<td>67</td>
</tr>
<tr>
<td>Kuala Trengganu</td>
<td>Location</td>
<td>89%</td>
<td>61%</td>
</tr>
<tr>
<td>Owner</td>
<td>Location</td>
<td>11%</td>
<td>39%</td>
</tr>
<tr>
<td>Total sample</td>
<td>Location</td>
<td>18</td>
<td>57</td>
</tr>
<tr>
<td>Shah Alam</td>
<td>Location</td>
<td>88%</td>
<td>49%</td>
</tr>
<tr>
<td>Owner</td>
<td>Location</td>
<td>12%</td>
<td>51%</td>
</tr>
<tr>
<td>Total sample</td>
<td>Location</td>
<td>49</td>
<td>39</td>
</tr>
<tr>
<td>Kemuning</td>
<td>Location</td>
<td>69%</td>
<td>24%</td>
</tr>
<tr>
<td>Owner</td>
<td>Location</td>
<td>31%</td>
<td>76%</td>
</tr>
<tr>
<td>Total sample</td>
<td>Location</td>
<td>35</td>
<td>45</td>
</tr>
</tbody>
</table>

Table 1. Age profile of respondents
mean satisfaction level was low at 2.2 with a vast majority (86.5%) of the owners indicating dissatisfaction (rating 1 or 2) as against only 8.1% indicating high satisfaction (rating 4 or 5). The results were very similar for Kuala Trengganu where the mean satisfaction level was at 2.1 with 93.5% of owners rating dissatisfied, but were markedly different for Shah Alam and Kota Kemuning where only 38.3% and 30.2% rated dissatisfied respectively with the corresponding mean scores of 3.06 and 3.32. Thus there is reason to believe that the eastern can be distinguished from the western region on the basis of the satisfaction levels of house buyers.

It would be reasonable to surmise that owners would react rather predictively according to their satisfaction or lack of it and that the nature of their reaction would influence their decisions or actions in terms of renovation initiatives. If this presumption is correct, the inclination to renovate is expected to be greater among the dissatisfied owners than the satisfied owners; as a corollary, more of dissatisfied owners and less of satisfied owners would engage in makeover initiative. However, when the data was subjected to Chi-square significance test (as illustrated in Table 2), no evidence is found of such association at $\alpha = 0.05$ level of significance. This implies lack of association between owners’ satisfaction level and their makeover initiative. In fact, the samples in combination produced a test value just outside the significance level (at $\alpha = 0.055$) with the individual data for Shah Alam, Kemuning and Kuala Trengganu producing values even further outside. These results are interesting for their lack of intuitive appeal. Only Kota Bharu showed a semblance of the expected behaviour where the existence of an association between satisfaction level and the makeover initiative was indicated.

Next the data on dissatisfied owners was examined for possible link between owners’ dissatisfaction and reaction to the dissatisfaction in terms of makeover initiatives. As expected, the link was very strong for all the four locations with dissatisfied owners either already having had alteration jobs done or had committed to one for the near future; none indicated that they would not do anything about it. In Kota Bharu, all but one dissatisfied owners performed makeover exercises at some point after acquiring their properties; even the single exception indicated an intention to perform the same in the near future. For Kuala Trengganu, the proportion of dissatisfied owners who had renovated was 93.1% while the remaining 6.9% would follow soon. In Shah Alam, the corresponding proportion was 88.9% with the remaining 11.1% indicating their plan to renovate immediately. Kemuning had the lowest percentage of its dissatisfied owners performing renovation. Even so, the percentage was high at 84.6% with the remaining 15.4% all indicating their intention to renovate in the near future.

However, when responses from the satisfied owners (scores of 4 or 5) were analysed, the findings became of interest because of some unexpected results they produced. In particular, they showed that makeover activities were high even among this group and almost matched those of the dissatisfied owners. Taking all the samples together, the proportion of satisfied owners who engaged in makeover was 74.0% while the results for the individual locations were 100% for Kuala Trengganu, 81% for Shah Alam and 70.8% for Kemuning. Only Kota Bharu was an exception with a much lower renovation rate of 33.3%, which relates closely to what is expected. It ought to be noted though that the sample sizes for Kuala Trengganu and Kota Bharu are probably too small for conclusiveness (see Table 3). Nonetheless, together with the findings of insignificance earlier, these results make evident the fact that satisfaction level may not be the only factor in owners’ decision to renovate. In a way, these results also accounted for why lack of association was found earlier between satisfac-

<table>
<thead>
<tr>
<th>Test</th>
<th>Value</th>
<th>Degree of freedom</th>
<th>Significance level (2-sided)</th>
</tr>
</thead>
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<tr>
<td>Pearson Chi-Square</td>
<td>9.246</td>
<td>4</td>
<td>0.055</td>
</tr>
<tr>
<td>Likelihood Ratio</td>
<td>9.103</td>
<td>4</td>
<td>0.059</td>
</tr>
<tr>
<td>Linear-by-linear Association</td>
<td>9.13</td>
<td>1</td>
<td>0.003</td>
</tr>
<tr>
<td>No of valid observations</td>
<td>158</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Table 2. Correspondence between satisfaction level and renovation done*
tion level and makeover initiative. They also allow us to reasonably conclude the existence of association between renovation behaviour and satisfaction level among the dissatisfied owners although a similar conclusion cannot be made about the satisfied owners. It is suggested here that this apparent non-conformance in results is capable of some explanations which lie beyond the scope of current investigation. However, further evidence in the next paragraph reinforces this argument.

This is taken in light of the fact that a significant majority of the owners intended to pursue subsequent renovations. Of all the owners (satisfied and dissatisfied included) who had actually undertaken renovation works, 73.7% intended to proceed with a second (or subsequent) renovation in the near future. By location, the percentages were 94.1% for Kota Bharu, 72.4% for Kuala Trengganu, 48.8% for Shah Alam and 79.1% for Kemuning. Even among just the satisfied owners, more than half (54.1%) indicated their intention to renovate again. It would seem that a separate investigation would be needed to provide confirmatory evidence in support of the above partial indication.

It is also a paradox that, in terms of the timing of the renovation, the proportion that performs pre-occupancy renovation was higher among the satisfied group (16.2%) than the dissatisfied group (12.9%) as shown in Table 4. This suggests even further that the motivation for housing customisation goes beyond mere satisfaction level. The proportion is also higher among the satisfied group for doing post-occupancy customisation only.

In all, evidences are compelling that dissatisfied owners make the majority of house buyers in the eastern region but to a much lesser extent in the western region. They also suggest an intense link between being dissatisfied and making the renovation move. However, evidence of the converse situation is less clear with a majority of satisfied house owners pursuing renovation despite not having the dissatisfaction reason for it.

In relation to whether customers would prefer a customised house over developer’s standard unit, the response was overwhelmingly positive among the respondents (see Table 5). Respondents were also asked in terms of the various opportunity costs that they would have to bear to secure customised houses. Nonetheless, very similar results were obtained where the opportunity costs were in terms of having to pay more or to wait longer. On all the above aspects, owners and non-owners scored similarly except on the willingness to pay, where the proportion was greater among non-owners. Of those who chose customised housing, only 5.3% were unwilling to pay more for it with slightly higher percentages unwilling to wait longer or spend time at architects’ office, at 9.2% each.

The high importance respondents placed on the availability of options to own customised houses is evident from the mean score of 4.32 computed for this question. Some concern was expressed

<table>
<thead>
<tr>
<th>Locality</th>
<th>Yes</th>
<th>No</th>
</tr>
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<tbody>
<tr>
<td>Kota Bharu</td>
<td>33.3</td>
<td>66.7</td>
</tr>
<tr>
<td>Kuala Trengganu</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>Shah Alam</td>
<td>81.0</td>
<td>19.0</td>
</tr>
<tr>
<td>Kemuning</td>
<td>70.8</td>
<td>29.2</td>
</tr>
</tbody>
</table>

Table 3. Responses among satisfied owners across the different sample areas

<table>
<thead>
<tr>
<th>Group</th>
<th>Before</th>
<th>After</th>
<th>Before and After</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dissatisfied</td>
<td>12.9</td>
<td>21.2</td>
<td>65.9</td>
<td>100</td>
</tr>
<tr>
<td>Satisfied</td>
<td>16.2</td>
<td>37.8</td>
<td>45.9</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>13.9</td>
<td>26.2</td>
<td>59.8</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 4. Pre-occupancy renovation among the different groups
by respondents with regard to the possibility of such option leading to too many choices that could complicate decisions (mean = 3.24), but respondents were at the same time in favour of customised house for the flexible price it offers (mean = 3.95) and for the wastage it avoids (mean = 4.01). In fact, the Chi-square test of independence showed significance of association between the two latter variables and the importance factor at $\alpha = 0.05$ level of significance. Also evident was the fact that between current owners and first time buyers, the latter were more in favour of customised housing on every aspect evaluated, as statistics in Table 6 make clear.

How do dissatisfied owners compare against the satisfied group in terms of the renovation details? The data is shown in Table 7. For the first renovation, three items emerged as most commonly pursued by the owners: door grille, window grille and repainting. In this respect, there were little differences between the satisfied and dissatisfied groups as in Table 7 with a vast majority spending on these three items. This means that the three items were basic necessities to owners regardless of whether they were satisfied or dissatisfied. Of the three, two were related to security while the other was repainting job.

The dissatisfied owners appeared to have done more in terms of the counts on the renovation jobs done, doing an average of 5.55 pieces of renovation jobs per person. This figure is, however, only marginally (6%) higher than the satisfied group, at

<table>
<thead>
<tr>
<th>Level of agreement (Likert scaling of 1 to 5)</th>
<th>Non-owner</th>
<th>Owner</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>More choices on housing specifications mean more difficult to make decisions</td>
<td>3.30 (0.950)*</td>
<td>3.15 (0.980)</td>
<td>3.24 (0.962)</td>
</tr>
<tr>
<td>Sample size</td>
<td>178</td>
<td>109</td>
<td>287</td>
</tr>
<tr>
<td>Customised house is desirable because it offers flexibility in pricing</td>
<td>4.00 (0.521)</td>
<td>3.88 (0.663)</td>
<td>3.95 (0.581)</td>
</tr>
<tr>
<td>Sample size</td>
<td>178</td>
<td>109</td>
<td>287</td>
</tr>
<tr>
<td>Customised house is desirable because the purchaser avoids paying for unwanted specifications</td>
<td>3.99 (0.552)</td>
<td>4.06 (0.664)</td>
<td>4.01 (0.597)</td>
</tr>
<tr>
<td>Sample size</td>
<td>178</td>
<td>109</td>
<td>287</td>
</tr>
<tr>
<td>Customised housing is important to go for</td>
<td>4.25 (0.600)</td>
<td>4.42 (0.657)</td>
<td>4.32 (0.626)</td>
</tr>
<tr>
<td>Sample size</td>
<td>178</td>
<td>109</td>
<td>287</td>
</tr>
</tbody>
</table>

* Standard deviation in parenthesis

Table 6. Respondents’ attitude towards customised housing

<table>
<thead>
<tr>
<th>Among the dissatisfied</th>
<th>Among the satisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item</td>
<td>% doing it</td>
</tr>
<tr>
<td>Door grille</td>
<td>99</td>
</tr>
<tr>
<td>Window grille</td>
<td>96</td>
</tr>
<tr>
<td>Repainting</td>
<td>79</td>
</tr>
<tr>
<td>Kitchen hall</td>
<td>37</td>
</tr>
<tr>
<td>Bedroom</td>
<td>30</td>
</tr>
</tbody>
</table>

Table 7. How dissatisfied owners compared against satisfied owners on renovation details
In terms of the individual groups of renovation, the dissatisfied group was inclined more towards security, sizes and ventilation and less on cosmetic, compared to the satisfied group. This indicates, to an extent, where the dissatisfactions lie (Table 9).

What about those who currently already have a house and are purchasing a new one - what do they consider to be important in new houses? Combining the samples together as presented in Table 10, the results showed high importance owners placed on all the listed attributes of house size, makeovers and security with security aspect ranked the highest followed by size and makeover. However, this order does not necessarily follow in the individual locations. In Kuala Trengganu, owners placed security second, after size. In terms of house size, owners in Kuala Trengganu place highest importance (4.69) followed by Kota Bharu (4.65), Shah Alam (4.61) and Kemuning (4.34). On security, owners in Kota Bharu believe it to be absolutely important while those in Kemuning, Shah Alam and Kuala Trengganu believe it to a lesser degree. Makeovers lag behind in third place; however, Shah Alam owners placed much greater importance on makeovers compared to other areas, as seen from the high average score that almost match for other attributes while Kuala Trengganu placed the lowest on this attribute.

Among non-owners, similar ranking obtained whereby security prevailed as the highest on average score albeit with slightly lower mean than in the case of owners. Among non-owners, those in Kemuning appeared to have placed greatest importance on security although not as highly as the absolute importance placed by owners in Kota Bharu. It needs to be noted that the ranking result here is merely suggestive and not considered conclusive in view of the limitations in the data.

How did owners and non-owners compare? The results show that non-owners place less importance but the differences are too marginal to be significant. Overall, the two groups placed similar levels of importance across the attributes concerned. However, in different areas, the results were slightly different. In Kemuning and to a large extent in Kuala Trengganu, non-owners placed higher on importance level than owners on all attributes.
This study has set out to examine whether or not there is demand-side market readiness for the housing mass customisation concept. The findings show evidence in the positive direction. They suggest that housing mass customisation appears headed for a promising future. This is evident from the fact that dissatisfaction is prevalent among buyers of the developer-delivered standard housing products and also that an overwhelming proportion of the prospective buyers are strongly in favour of

### Table 9. Counts on renovation jobs done by group of works

<table>
<thead>
<tr>
<th>Size</th>
<th>Dissatisfied</th>
<th>Satisfied</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extension of livinghall</td>
<td>15</td>
<td>8</td>
<td>23</td>
</tr>
<tr>
<td>Extension of dinnerhall</td>
<td>15</td>
<td>12</td>
<td>27</td>
</tr>
<tr>
<td>Extension of kitchenhall</td>
<td>46</td>
<td>19</td>
<td>65</td>
</tr>
<tr>
<td>Extension of balcony</td>
<td>22</td>
<td>9</td>
<td>31</td>
</tr>
<tr>
<td>Extension of bathroom</td>
<td>8</td>
<td>6</td>
<td>14</td>
</tr>
<tr>
<td>Extension of bedroom</td>
<td>16</td>
<td>8</td>
<td>24</td>
</tr>
<tr>
<td>Extension of car porch</td>
<td>38</td>
<td>18</td>
<td>56</td>
</tr>
<tr>
<td>Enclosure of balcony</td>
<td>22</td>
<td>6</td>
<td>28</td>
</tr>
<tr>
<td>Others</td>
<td>2</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td><strong>Group total</strong></td>
<td><strong>184</strong></td>
<td><strong>87</strong></td>
<td><strong>271</strong></td>
</tr>
<tr>
<td><strong>Group average</strong></td>
<td><strong>2.00</strong></td>
<td><strong>1.74</strong></td>
<td><strong>1.91</strong></td>
</tr>
</tbody>
</table>

### ‘Cosmetic’ works

<table>
<thead>
<tr>
<th>Size</th>
<th>Dissatisfied</th>
<th>Satisfied</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Replacement of flooring</td>
<td>31</td>
<td>17</td>
<td>48</td>
</tr>
<tr>
<td>Repainting</td>
<td>64</td>
<td>28</td>
<td>92</td>
</tr>
<tr>
<td>Alteration of Staircase</td>
<td>3</td>
<td>10</td>
<td>13</td>
</tr>
<tr>
<td>Fitting of Cabinet</td>
<td>13</td>
<td>15</td>
<td>28</td>
</tr>
<tr>
<td>Plastering of Ceiling</td>
<td>6</td>
<td>10</td>
<td>16</td>
</tr>
<tr>
<td>Replacement of Fences</td>
<td>18</td>
<td>12</td>
<td>30</td>
</tr>
<tr>
<td>Others</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Group total</strong></td>
<td><strong>135</strong></td>
<td><strong>93</strong></td>
<td><strong>228</strong></td>
</tr>
<tr>
<td><strong>Group average</strong></td>
<td><strong>1.47</strong></td>
<td><strong>1.86</strong></td>
<td><strong>1.61</strong></td>
</tr>
</tbody>
</table>

### Security aspect

<table>
<thead>
<tr>
<th>Size</th>
<th>Dissatisfied</th>
<th>Satisfied</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Door grille</td>
<td>82</td>
<td>34</td>
<td>116</td>
</tr>
<tr>
<td>Window grille</td>
<td>80</td>
<td>32</td>
<td>112</td>
</tr>
<tr>
<td>Security alarm</td>
<td>5</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>Automatic gate</td>
<td>2</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Others</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Group total</strong></td>
<td><strong>169</strong></td>
<td><strong>74</strong></td>
<td><strong>243</strong></td>
</tr>
<tr>
<td><strong>Group average</strong></td>
<td><strong>1.84</strong></td>
<td><strong>1.48</strong></td>
<td><strong>1.71</strong></td>
</tr>
</tbody>
</table>

### Others

<table>
<thead>
<tr>
<th>Size</th>
<th>Dissatisfied</th>
<th>Satisfied</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ventilation system</td>
<td>20</td>
<td>9</td>
<td>29</td>
</tr>
<tr>
<td>Power saving features</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td><strong>Group total</strong></td>
<td><strong>23</strong></td>
<td><strong>9</strong></td>
<td><strong>32</strong></td>
</tr>
<tr>
<td><strong>Group average</strong></td>
<td><strong>0.25</strong></td>
<td><strong>0.18</strong></td>
<td><strong>0.23</strong></td>
</tr>
</tbody>
</table>

### Table 10. Importance placed on the various aspects of renovation

<table>
<thead>
<tr>
<th>Importance of security</th>
<th>Non-owner</th>
<th>Owner</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Importance of work</td>
<td>4.37 (0.559)</td>
<td>4.50 (0.587)</td>
<td>4.42 (0.567)</td>
</tr>
<tr>
<td>Importance of cosmetic treatment</td>
<td>4.06 (0.690)</td>
<td>4.07 (0.690)</td>
<td>4.07 (0.689)</td>
</tr>
<tr>
<td>Importance of others</td>
<td>3.08</td>
<td>3.68</td>
<td>3.26</td>
</tr>
</tbody>
</table>

* Standard deviation in parenthesis

### CONCLUSION

This study has set out to examine whether or not there is demand-side market readiness for the housing mass customisation concept. The findings show evidence in the positive direction. They suggest that housing mass customisation appears headed for a promising future. This is evident from the fact that dissatisfaction is prevalent among buyers of the developer-delivered standard housing products and also that an overwhelming proportion of the prospective buyers are strongly in favour of...
customised housing. Further in support is the readiness of a vast majority of the prospective buyers to endure costs in time and money to secure housing that is customised to their wants.

This study is important to the development of mass customised housing in Malaysia since it has examined one of the critical success criteria for the concept: market readiness on the demand side. Through a survey of the housing consumers, the study found confirmatory evidence of a demand for mass-customised housing given the consumers’ low satisfaction currently with the standard-specified housing products that have been supplied to the market. It also reveals the extent of house owners’ readiness to embrace housing customisation to achieve their desired housing products. This is also true of future buyers who displayed high motivations for undertaking housing renovations as they seek a specification that matches their exact desire. Also clear is that renovation is compulsive not only among the dissatisfied group but even among the satisfied owners. Although the findings show that satisfaction is not necessarily the only motivation for renovation, they also show that the enthusiasm towards renovation is universal. This perhaps does not come as a surprise because as house buyers become more sophisticated and discriminating in their taste, they expect housing suppliers to respond in a more buyer-centric manner.

In light of the evidence in this study, a concerted programme on housing mass customisation presents the logical next step forward for the Malaysian housing industry. Given the positive impacts of mass customisation on wastage avoidance, enhancement of house buyer satisfaction, promotion of building sustainability, and on the entrepreneurial opportunities open to housing developers, it is not surprising that this concept has gained increasing recognition among developed nations. This does not mean that there is no downside to it. There are, however, lessons to be learned from each country. Barriers to innovation must be addressed; Malaysia must achieve significant level of IBS in housing construction for mass customisation to be viable. Institutional support is an important consideration. The legal framework needs to facilitate this important innovation in housing with similar spirit from the implementing bodies. The elicitation gap between builder and customer has to be narrowed or closed, with particular reference to Taiwan’s case. Finally, readiness on the demand side must be met with similar readiness from the supply side. As the next step to this study, therefore, the supply-side readiness for the concept needs to be examined. This would constitute the next stage of the research.

REFERENCES


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Queen’s University Belfast
Belfast, Northern Ireland, United Kingdom
u.sengupta@qub.ac.uk

<table>
<thead>
<tr>
<th>Race</th>
<th>Sex</th>
<th>Age</th>
<th>Job type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male (%)</td>
<td>Female (%)</td>
<td>&lt;30 (%)</td>
</tr>
<tr>
<td>Delhi</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Malay</td>
<td>65.7</td>
<td>54</td>
<td>20</td>
</tr>
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<td>18.9</td>
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<td>64</td>
</tr>
<tr>
<td>Indian</td>
<td>7.46</td>
<td>50</td>
<td>40</td>
</tr>
<tr>
<td>Others</td>
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<td>50</td>
<td>50</td>
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<tr>
<td>Kuala Lumpur</td>
<td></td>
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<td>90.7</td>
<td>58</td>
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<td>8.5</td>
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<tr>
<td>Indian</td>
<td>0.8</td>
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<tr>
<td>Others</td>
<td>0.6</td>
<td>50</td>
<td>75</td>
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<td>Shah Alam</td>
<td></td>
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<tr>
<td>Malay</td>
<td>64.4</td>
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<td>34</td>
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<td>Chinese</td>
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<td>40</td>
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<td>Indian</td>
<td>10.2</td>
<td>42</td>
<td>58</td>
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<tr>
<td>Others</td>
<td>3.4</td>
<td>25</td>
<td>75</td>
</tr>
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<td>Kedah</td>
<td></td>
<td></td>
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<td>Malay</td>
<td>92.5</td>
<td>58</td>
<td>42</td>
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<td>Chinese</td>
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<td>Indian</td>
<td>0.8</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>Others</td>
<td>0.8</td>
<td>100</td>
<td>0</td>
</tr>
</tbody>
</table>

APPENDIX A: Profile of respondent samples
COMPARISON OF POST-DISASTER HOUSING PROCUREMENT METHODS IN RURAL AREAS OF TURKEY

Nese Dikmen, Soofia Tahira Elias-Ozkan and Colin Davidson

Abstract

Earthquakes strike without warning, even though they are known to recur. It is nonetheless difficult to mobilize resources to plan for them in advance, despite the high social and economic costs that can be anticipated, and despite the humanitarian obligation to provide quality and safe housing.

This research examines two post-earthquake housing reconstruction projects in rural areas of Turkey, where different procurement strategies were used. A top-down strategy was adopted in Dinar after the October 1995 earthquake; and a bottom-up strategy was adopted in the Orta district in Cankiri after the June 2000 earthquake in the region.

Based on information obtained from government agencies, building contractors and the projects beneficiaries, a comparison has been made between the two procurement methods. While no generalized conclusions can be drawn – as the projects were conducted in the particular circumstances that prevail in rural areas of Turkey – it is possible to highlight key factors that can properly influence future housing procurement processes.

Keywords: earthquake; housing procurement; housing reconstruction; top-down approach; bottom-up approach; community participation.

INTRODUCTION: DISASTERS AND RECOVERY

Disasters are defined as “sudden calamitous events bringing great damage, loss, or destruction” (http://www.merriam-webster.com/dictionary/disaster); Weeks (2007:2) also defines disasters as “widespread events, which involve massive loss of life and significant damage to shared infrastructure”. On the other hand, Choularton (2001:61) supports the argument that disasters are not events but the negative results of an event or series of events, whose impact is disruptive and destructive and whose magnitude is sufficient to be labeled ‘disastrous’.

It must immediately be pointed out that even if the notion of “disaster” is directly associated with a natural event, such as an earthquake or a hurricane, it is not often the natural event per se which leads to many deaths and injuries, but rather the way the built environment has developed, spontaneously or planned, over the years (Lizarralde et al. 2010). It is indeed the insufficient performance of the built environment which gives a disaster its three qualifying traits, which are: significant loss of life; sudden occurrence without effective warning; and widespread impact over society, culture, and often geography (Weeks 2007:3). Although it is possible to predict the occurrence of some natural disasters like hurricanes and storms, others like earthquakes or landslides cannot be predicted precisely—neither in time nor place— even if, in many regions, one can be sure that a disaster will occur sooner or later. This inability to foresee precisely has an impact on the relative priority attached to advance planning for disaster mitigation, post-disaster recovery and reconstruction.

If lessons can be learnt from a disaster and, more importantly if the lessons can be transformed into explicit or tacit knowledge so as to prevent or mitigate future disasters, then the original disaster can be considered to have had a beneficial impact on society, however perverse this may appear (Choularton 2001:61; Gharaati and Davidson...
Disaster preparedness relies on “the knowledge and capacities developed by governments, professionals, organizations, communities and individuals to effectively anticipate, respond to, and recover from, the impacts of likely, imminent or current hazard events or conditions” (UNISDR 2009:21). Indeed, disaster preparedness presupposes an effort to “design” the disaster response system that can best fit the local administrative and social contexts (Davidson 2010), even in situations of predictable chaos.

After a disaster occurs the resulting social and economic destruction is manifest in the more immediately visible destruction of the physical environment. Hence, the major problem after a disaster is to enable the victims, whose psychological, social, and economic integrity was damaged along with their physical environment, to obtain a new habitat with at least similar qualities, or even better, at an improved level (Tas et al. 2007:3418).

This goal is not easy to attain, since sudden and destructive disasters create chaos and disorder both for people and for local community organizations; consequently, administrative activities that have hitherto been functional, linearly designed and centralized are seriously disrupted. “This chaos also affects the performance of a disaster response system in organizing a timely and coordinated operation” (Corbacioglu 2006:212). In the event of a disaster, the focus tends to be on response and initial recovery, with little long term planning; while reconstruction projects are procured in an ad-hoc, reactive way (Masurier et al. 2006:6). This state of affairs is not conducive to sustainable recovery, reconstruction or disaster mitigation.

Disaster mitigation and risk reduction are important prerequisites to maintaining sustainable development because a widespread disaster has the power to hamper, any ongoing progress and achievements in the direction of sustainable development (Chowdhury 2011:399).

To counter this risk the following seven principles of sustainable development can be applied to disaster recovery, in order to ensure a sustainable solution (Rosenberg 2011:178):
1. Balance needs and limits imposed by natural forces
2. Take precautionary actions that limit vulnerability
3. Rebuild to last several generations
4. Aim to reduce poverty
5. Consider effects of damage on surrounding areas
6. Make the polluter pay for the “downstream” damage
7. Ensure community participation.

The recovery process following a natural disaster relies heavily on a well-planned approach directed toward both short-term and long-term housing, while increasing community resilience (Gonzales 2011:315).

**POST-DISASTER RECONSTRUCTION**

There is a clear humanitarian imperative to provide victims of a disaster with basic shelter rapidly, in the same sense as there is a humanitarian imperative to ensure access to water, sanitation, food and healthcare equally rapidly. However, the humanitarian justification for housing reconstruction (a longer term endeavor) is more problematic. Reconstruction resembles development in that it deliberately sets out to re-establish lost assets, or even to provide better and more robust facilities than existed prior to the disaster event (Barakat 2003:1).

In the specific case of housing reconstruction, one runs up against two apparently divergent doctrines: (i) the so-called top-down approach, which uses official paths including governments, banks and developers; and which observes formal norms for building standards and land-use management (Johnson 2007:33) and (ii) the bottom-up approach which relies on empowerment of the disaster victims (now the “beneficiaries” of the reconstruction project) so that they can be given the wherewithal to improve their own habitat. These two doctrines are based on simplistic views of the reconstruction processes, and choosing between them impedes designing properly adapted responses to the urgent requirements. Top-down tends to take little account of the beneficiaries’ capabilities and resourcefulness; bottom-up may risk bypassing potential methods for speedy and safe reconstruction.
Worldwide experience of reconstruction after disasters, whether natural or man-made, has demonstrated the failure of conventional top-down approaches (El-Masri and Kellett 2001:536). This is because top-down approaches tend to emphasize standardization and technology-oriented solutions to get the job done quickly and economically. The outcomes of the top-down approaches have been found to neglect cultural and local conditions as well as users’ needs because this approach is often adopted in response to the urgency to supply housing rapidly (Johnson 2007). Indeed, approaches that are not bottom-up can produce housing units that are expensive and alien; i.e. they are either not affordable or not suitable for the beneficiaries. Such post-disaster housing (PDH) units are often altered to fit the rural lifestyle or, failing that, abandoned by the users.

In contrast, the essential principles of the bottom-up approaches in dealing with reconstruction after disasters call for involving the user, adopting appropriate technologies, and integrating rebuilding and development concurrently (El-Masri and Kellett 2001:536). Although, user involvement may result in time-consuming discussions and complex management operations before implementation can start, the overall advantages of bottom-up approaches have been extolled by many scholars. El-Masri and Kellett (2001) claim that if and when properly planned and implemented such an approach guarantees a smoother implementation, a more economical solution that is better tailored to the needs and means of the users and to their abilities and aspirations (El-Masri and Kellett 2001:536). Some authors go so far as to suggest that successful reconstruction cannot be achieved without the participation of civil society and local organizations, which usually have a better understanding of the dynamics of the social structure within a given community as opposed to larger governmental units (Miller and Rivera 2011)

According to many authors (Barakat 2003; Barenstein 2006; and Lawther 2009; etc.), community driven reconstruction projects are advantageous because they can be more cost-effective and of better quality (if technical and supervision skills exist); they permit incremental re-construction and thus earlier occupation; they are more empowering as they build up confidence, local capacity and employment opportunities; and finally, they help preserve the local cultural heritage.

It has to be pointed out that these two doctrines (top-down and bottom-up) are based on oversimplified views of the reconstruction processes, and adopting the position that one has to choose between them impedes designing properly adapted responses to the urgent requirements. Indeed, in addition to the integral top-down and bottom-up approaches, other approaches have been tried that are often more suitable to local conditions and cultures. For example in Gujarat four different approaches to post disaster housing reconstruction were employed by the administration. Barenstein (2006:2) lists them as follows:

• The “contractor driven approach” (either in-situ, at the original location; or ex-nihilo, at a new location) where the reconstruction work is handled by a contractor, with design and technical consultants.
• The “subsidiary housing approach”, where other agencies complement government grant with construction material and technical guidance.
• The “participatory housing approach”, where the various agencies lead the processes with full participation of the beneficiaries.
• The “owner driven approach”, where the owners did not participate in the construction work but retained full control over the processes.

The two Turkish examples described in this paper correspond to the first and last of these approaches to post-disaster housing reconstruction, and represent the classical top-down and bottom-up approaches.

POST-DISASTER HOUSING PROCUREMENT

According to a report prepared by Rudman et al. (2003) disaster preparedness planning (before the disruptive event occurs) involves various governmental and non-governmental agencies that may have overlapping jurisdictions and competing agendas and interest. Hoard et al. (2005) refer to reports published by the Institute of Medicine (IOM 2002) and the Office of Rural Health Policy (ORHO 2002) when they point out that it is not easy for all parties to collaborate and communicate effectively,
especially when these agencies have limited resources and funding; as is often the case in rural areas. In the post-disaster situation, these challenges are even more complex because of the general disruption in organized society and the ensuing chaos; it is not even easy to make up on any deficiencies in the advanced planning, and there are usually many of them. It is not surprising therefore that designing the planning process, (called the ‘organizational design’), is challenging; indeed its importance is not often properly recognized.

In construction sector terminology, the organizational design process is referred to as ‘procurement’ and it includes all the stages of planning, design, and production of buildings and infrastructures (Lyons 2009). Masurier et al (2006:4) refer to Moore’s (2002) point of view that procurement is a strategy for development which aims to satisfy the client’s needs and state that procurement entails detailed preparations by the agencies concerned for delivering the reconstruction project; while these preparations include identification of suppliers and facilitators, drafting agreements and legal framework; establishing target costs and assigning responsibilities. Masurier et al. (2006:4) point out that it is crucial to establish an adequate procurement system which ensures that rebuilding work is speedy and low cost; resources used are local; communication and trust between all parties is established amicably; and the system adopted is not unfamiliar for its implementers.

In essence, organizational design and procurement are inseparable. Organizational design involves preparing for and consolidating the relationships between the parties who will be implicated with or affected by a program of work and its constituent projects; procurement translates this organization into a set of defined agreements with the required participants, including determining how they will be chosen and contracted with. Conversely, adopting a particular procurement strategy (for whatever reasons – regulations, customs, habit, etc.) affects the nature of the organizational designs that are reasonable in the circumstances (Davidson 2010:88). These are discussed in the specific context of Turkey.

POST-DISASTER RECONSTRUCTION IN TURKEY

Turkey has suffered many natural disasters in the form of earthquakes, landslides, floods, droughts, rock falls and avalanches, etc. due to its geological, topographical and climatic conditions. Since the beginning of the last century, such disasters have caused approximately 87,000 deaths, 300,000 injuries and damaged almost 700,000 buildings. Of these buildings 76% were damaged during earthquakes, 10% during landslides, 9% in floods and 5% due to other natural disasters (Turkish Republic Country Report On Disaster Management 2008).

Due to widespread destruction of human habitat, providing permanent shelter to the homeless constitutes an important portion of the post-disaster reconstruction budget. How this budget is apportioned between the various reconstruction projects and which procurement method is opted for depends on government policies and funding agency contracts. For example, the World Bank was one of the international agencies that provided funding to the Turkish government for post-earthquake housing reconstruction in Kocaeli, in 1999. According to Ganapati and Ganapati (2009: 42, 49), although the terms and conditions of the World Bank’s loan contract supported public participation in the reconstruction project it was limited to the participation of the beneficiaries in the discussions only and their feedback was not even incorporated into the housing plans. As the authors point out, the perspectives of the disaster victims are important and are at the core of public participation; yet they receive only cursory attention in official reports; perhaps due to a sense of urgency, concern for cost effectiveness and inflexible terms and conditions of the loan.

Turkish law defines three types of procurement methods for providing post-disaster housing: contractor-driven, funding agency-driven and owner-driven approaches (applying the terminology developed by Barenstein 2006). However, decision-making in the post-disaster context is not easy, and the choice of approaches often falls back on routines and their repetition.

If the contractor-driven approach (referred to as the “tendering-procedure” in Turkish law) is adopt-
ed, the procedures follow the classical process of two-step procurement: contractors are pre-qualified, invited to tender and the lowest conforming tender is selected. This procedure is advantageous for contractors as it allows them to demand a price-hike under the inflation clause.

If the funding agency-driven approach is adopted, the government agency not only provides the funding, construction materials and technical guidance for the project but also institutes a special committee that oversees the work undertaken by the (usually) small contractors. This procedure is adopted only if the work is not profitable enough to attract large contractors to bid for the project.

In contrast to these two procedures which both correspond to the top-down approach, the owner-driven procedure is an example of the bottom-up approach. Here the home owners who are the project beneficiaries are provided with funds to repair or reconstruct their houses in accordance with Article 44 (Regulations on allocation of post-disaster rebuilding funds to disaster victims, 1970). According to this regulation the Ministry of Public Works and Settlement (MPWS) provides audited assistance, in the form of technical supervision, and house re-building loans to disaster victims who have earned the status of beneficiaries. A part of this assistance may be provided in the form of construction material and the rest in cash. Periodic payments are released at various stages of completion after the approval of the Ministry’s technical team that is monitoring the progress of the construction works.

It should be noted here that the amount of funding per unit provided to contractor- or agency-driven projects exceeds that provided to beneficiaries for their owner-driven projects. For instance, in Kocaeli, the Ministry floated tenders for centrally heated PDH measuring 99m2 at an estimated cost of 12 billion Turkish Liras (TL) per unit (20,000 USD in April 2000); while the Prime-ministry estimated the cost of an 80m2 PDH unit, without a heating system, to be 14,000USD. Meanwhile, the amount of loan provided to owner-driven projects was only 6 billion Turkish Liras (10,000 USD) per unit, regardless of the size of the PDH or its heating system (T.C Sayistay Baskanligi 2003:8-9)

Although, construction companies can claim an increase in their costs on the basis of current inflation rates; this difference is not paid to owner-driven projects. For instance in Kocaeli, the contractors had initially agreed to build the PDH unit for 9.6 billion TL (16,000USD) but later they claimed an extra 900 million TL due to price inflation, thereby increasing the cost of the PDH unit from 9.6 to 10.5 billion TL. Whereas the beneficiaries had to make do with the fixed amount of 6 billion TL only (T.C Sayistay Baskanligi, 2003:52).

RESEARCH SCOPE AND OBJECTIVES

The aim of this study was to analyze and compare the top-down and bottom-up approaches adopted for procuring post-disaster housing in rural areas of Turkey. To this end it was necessary to first understand how the procurement procedures fit into the overall strategic planning for post-disaster reconstruction and then to determine the various steps taken in the two approaches. In 2005, research was undertaken in the villages of Cankiri, where the owner-driven model was used for the construction of post-disaster houses; this model was based on the bottom-up approach. Hence, to compare it with one based on the top-down approach a somewhat similar field survey was done in the villages of Dinar, in 2008; where the contractor-driven ex-nihilo model had been used.

Interviews were first conducted with 11 officials of the General Directorate of Disaster Affairs (GDDA) and MPWS to collect information on post-disaster reconstruction and the housing procurement methods. Details on the tendering procedure for the top-down contractor-driven project in Dinar were obtained from one of the builders of the post-disaster houses in that region; and information on the bottom-up owner-driven housing projects was solicited from the headmen of the 9 quake affected villages in Cankiri. Finally, regulations on housing procurement methods were studied and a flowchart was prepared linking strategic planning of reconstruction projects with the post-disaster housing procurement procedures. In this diagram (shown in Figure 1) recommendations based on the findings of the research have also been integrated.
In order to understand the difference between the top-down and bottom-up approaches adopted for procuring post-disaster housing in Turkey, it is essential to analyze them as part of a strategic plan for post-disaster reconstruction projects. Figure 1 shows the various steps taken in the aftermath of a disaster, beginning with a rapid initial assessment of the situation followed by emergency aid consisting of rescue operations and meeting immediate needs of the disaster victims -- including the establishment of communication networks and safety in the area. Then, a detailed assessment of loss of life and property is made and the number of homeless and their housing needs are identified. The disaster area is cleared of any dangerously damaged buildings and reconstruction work begins, either in the same area or at a different location depending on the situation on the ground. Although reconstruction work entails repair and rebuilding of both infrastructure and buildings in the disaster area, this paper focuses specifically on post-disaster housing reconstruction in rural areas.

A post-disaster housing project is planned according to the number of beneficiaries and their requirements, and a decision is made as to its location and the procurement method; i.e. top-down or bottom-up. If a top-down approach is to be adopted then the PDH design is selected from one of the standard plans approved by the Ministry and the construction work can be started by a turn-key contractor or the funding agency. On the other hand, a bottom-up approach delegates much of the responsibility to the beneficiaries of the reconstruction project. Detailed steps followed in either approaches are presented in the abovementioned flow chart, which was prepared according to information gathered through interviews with the government officials and the beneficiaries. This figure also illustrates possible measures for improving either approach by integrating the participatory process, as recommended at the conclusion of this study.

An earthquake of magnitude 5.9 on the Richter scale shook Dinar and neighboring districts of Afyonkarahisar province, on the 1st of October 1995. Consequently, 2,473 houses were severely damaged, 1,218 houses were moderately damaged and 2,076 houses were slightly damaged.

In the aftermath of the disaster, initial damage and needs were assessed and the disaster victims were provided with tents, blankets and food, accordingly. Later, the GDDA completed the detailed damage assessment and identified the number of heavily-, moderately- and slightly-damaged properties and the number of beneficiaries of the reconstruction project. The Ministry decided to provide loans to repair the moderately damaged houses and to construct new PDH for owners of severely damaged houses. Meanwhile, all beneficiaries were to be housed in temporary housing as long as repair and reconstruction works continued.

The Ministry opted for a top-down contractor-driven approach and floated tenders for the procurement of new PDH in the disaster area. Four-storey apartment buildings were to be constructed for beneficiaries in the urban areas, while in rural areas, where empty land was abundantly available, detached houses more in keeping with the rural lifestyle were to be built. It was also considered prudent to relocate those rural settlements which had suffered colossal damage due to their proximity to the fault-line. The GDDA team scoured the area for appropriate locations for new settlements near the original villages and the village headmen were consulted in this regard.

Earlier, in 1983, the Ministry had commissioned standard PDH designs for urban and rural areas in the four climatic regions of Turkey. Some of these houses were designed as single and some as double-storied structures with covered areas ranging from 65 to 85m² depending on the number of bedrooms (2 or 3). Houses designed for rural areas also incorporated barns under the house or next to it (T.C. Bayindirlik ve Iskan Balkanligi, 1984). Only one of these readymade standard PDH plans, consisting of a single-story and having a covered area of 76.61 m², was chosen for construction in the vil-
lages of Dinar. The quake-hit settlements were examined and a decision was made to relocate villages that were exposed to future earthquake risks. The mukhtar i.e. the village headman was consulted on the new location for the PDH, and the housing project was built at a distance from the original settlement, on more stable ground.

Information on funding agencies or the terms and conditions of their loans could not be obtained from the interviewees; hence, it can only be assumed that the reason for selecting a standard design and adopting the top-down approach in Dinar were the same as those quoted by Ganapati and Ganapati (2009) for the World Bank funded projects in Kocaeli.

The tender for turn-key construction projects in the affected villages was floated and construction companies with previous experience in PDH projects were selected, through a pre-qualification process, to tender individually for each group of

![Diagram of Correspondence between Satisfaction Level and Renovation Done](image)
housing. The Ministry awarded the work to more than 10 construction companies with the lowest bids and the construction started in 1996. The Ministry inspected the construction works at various stages for conformity with the architectural and engineering plans and the site-specific requirements before releasing the payments due at these stages. The project progressed smoothly and the houses were completed within one year, as per contract, and handed over to the beneficiaries. As is customary, the last payment to the builders was held back to be released after one year of occupation of the houses by the beneficiaries; in case any problems or faults appeared in the construction that needed rectification by the builders.

**BOTTOM-UP APPROACH TO POST-DISASTER HOUSING PROCUREMENT: THE CASE OF ÇANKIRI**

On 6th of June 2000 an earthquake of magnitude 5.9 on the Richter scale shook the Orta district in Cankiri and the surrounding villages. The resulting devastation was especially concentrated in the rural area encompassing 9 villages (Demirtas et al. 2000:1-2). According to the records of the GDDA, 1,892 houses were demolished or heavily damaged, 184 were moderately-damaged and 2,440 houses were slightly damaged.

When the disaster occurred, the initial damage assessment was done by official teams and the immediate needs of the disaster victims, such as tents, blankets and food were met. Later, the GDDA and the MPWS completed the damage assessment survey and determined the number and types of housing units required as well as the number of beneficiaries of the project to whom house-building loans would be granted.

The Ministry started the reconstruction project in the disaster area, within the self-build paradigm and decided to provide house building loans to people whose houses were demolished or heavily damaged. In the year 2000, interest free loans of 5 billion TL (8,300 USD) were provided to each beneficiary with a payback period of 20 years. The following year, house building loans of 6 billion TL (10,000 USD) with the same repayment plan were provided to beneficiaries who had not been able to get the loan earlier.

Consequently, 1,221 permanent post-disaster houses were constructed in 69 villages and districts of Çankiri province. Three types of PDH were designed by a private firm for the reconstruction project initiated by the Ministry. These houses, with areas of 73.68 m², 84.71 m² and 103.75 m² respectively, were to be constructed with brick masonry walls, reinforced concrete structure and a tiled timber roof. Beneficiaries who did not like these standard designs had the option to get their houses custom designed by architects of their choice. It should be noted that the amount of loan was fixed and independent of the size of the proposed house.

The GDDA Construction Supervision Unit in Orta, was established specifically for the reconstruction project in the area. This unit was responsible for approving the custom designs, monitoring the construction works and releasing the loan payments to the beneficiaries according to the completed stages of construction. Most of the houses were completed by the year 2003.

Interviews conducted with beneficiaries residing in the affected villages of Cankiri revealed that several problems had been encountered during the implementation phase of the owner-build project. In accordance with the owner-driven approach the government had sanctioned an interest-free loan to the beneficiaries, allowed them to select their house plans, choose their own contractors or builders and manage their construction project themselves. The loan installments were handed over at predefined stages to the beneficiary who in turn paid their builders.

This procedure gave rise to three important problems; the first was related to costs, the second to building material and the third to management. It is a recognized fact that mass- or serial-production is more cost effective than one-off productions. Not surprisingly, since each unit of accommodation in Cankiri was produced one by one by individual owners, it resulted in higher unit costs. The second problem was related to the unavailability of construction material in the villages: the beneficiaries had to bring it from unknown retailers in neighboring towns; the added time and cost increased the total cost. The third problem was related to the home owners’ lack of construction management
abilities: the beneficiaries did not have adequate knowledge and experience on how building work should proceed and when to provide which building material; they either spent more than the allocated loan on the material by choosing comparatively expensive alternatives or by over-ordering. Some beneficiaries used part of the loan to employ experts to help them, when they realized that they did not have enough knowledge and experience on contracting issues. Due to these problems, either the construction period was extended or the money ran out before the house was completed. As a result, much of the construction took about 2 years to complete whereas several houses could not even be finished.

COMPARISON OF TWO POST-DISASTER HOUSING PROCUREMENT METHODS

The research indicates that the reconstruction project in Dinar was carried out systematically and in conformity with the regulations, and permanent houses were completed within one year, as stipulated. No failure or interruption was experienced in the “contractor-driven” top-down approach adopted by the state. On the other hand, in Cankiri where the “owner-driven” bottom-up approach was adopted, the construction period for the houses was longer and at times had to be extended due to problems encountered by the beneficiaries. These problems stemmed from the beneficiaries’ lack of knowledge and experience in terms of finding a suitable builder for the construction works, entering into a contract, procuring the right amount and quality of material at the right time and generally managing a construction project.

As post-disaster houses in Dinar were mass produced by private construction companies who had prior experience of building PDH and also had dependable material suppliers the actual cost of construction was the same as that estimated and fell within the budget. On the other hand, the costs of the post-disaster houses in Cankiri were higher than estimated due to their customized designs, which were comparatively larger than standard units for which the loans were provided. Also, the non-existence of building material suppliers in the villages forced the beneficiaries to travel long distances to procure material from unknown suppliers; thus adding further to the total cost.

Looking beyond these contractual considerations, when the Dinar and Cankiri projects are compared, the interesting differences are found to reside principally in the place allowed for user-participation in the process, with long term consequences. The beneficiaries in Dinar did not have a say in the design selected for the PDH as the Ministry chose a single house type to be built by all the construction companies in the area. Whereas, in Cankiri, beneficiaries were given the option to have custom designs built in case they did not choose one of the three standard housing designs provided by the Ministry.

Based on the findings of this research, the positive and negative aspects of the top-down and bottom-up approaches to post-disaster housing procurement methods (i.e. contractor-driven approach in Dinar and owner-driven approach in Cankiri) are presented in Table 1 below. When the two methods were compared, the top-down approach was found to be more positive in terms of selection of and control over the building contractors and the cost and duration of the project; in short, in terms of project management. On the other hand, the bottom-up approach was found to be more positive in terms of user participation and diversity in housing types.

Though the top-down approach is more convenient in post-disaster reconstruction projects in rural areas from the point of view of project management; user-satisfaction is also of paramount importance in the success of a project. If the beneficiaries are not satisfied with any aspect of the PDH project it is not easy to persuaded them to move into the new housing. There are many examples of PDH lying vacant because the beneficiaries were not satisfied with their design, facilities or location; as, for example, in the case of Gujarat (Barenstein 2006). In the long term, an inadequate fit between the beneficiaries’ way of life and the accommodation provided them will entail social costs that place a burden on public finances (Dikmen 2010).
CONCLUSION

In this paper, an example each of the bottom-up and top down approaches is described, based on field studies; the comparison highlights the need for more flexible models of the reconstruction process. The rural lifestyle and economy calls for different spaces and their arrangement within and without the dwellings, such as barns, bread ovens and food storage. A failure to cater to these needs within the framework of the reconstruction project will lead to the PDH being abandoned, sooner or later. This would be tantamount to the failure of the project and a failed project means a waste of resources which cannot be justified to the public at large.

As usual in the field of building and construction, the fundamental question concerns selecting the priorities for reconstruction projects and deciding who determines them. To what degree are construction-convenience and associated cost savings more important than variety of housing types and the fit with user requirements? In other words, is it better to build more cheaply and provide housing for more beneficiaries or to build, at greater cost, houses that are adapted to their occupants’ lifestyles?

Another important issue concerns the beneficiaries’ capabilities. Within the objective of empowering the beneficiary, is he or she being placed in a situation where delegated responsibility requires more skills than he or she can have? Does he or she know how to recognize what user requirements are and how to ensure that they are provided?

There is no standard response to such questions, if only because of the unavoidable impact of local traditions and cultural norms. Nevertheless, findings of the two post-disaster housing case-studies persuade us that the sustainability of a reconstruction project in rural areas can be ensured if certain precautions are taken in both procurement methods. It is recommended that a bottom-up approach be adopted to improve the success rate of the project; although, this is not always possible when the funding agency cannot be convinced of its advantages. Hence, if a top-down procurement approach cannot be avoided then the following precautions are recommended:

- Involve all parties in decision making processes related to the housing project
- Incorporate the requirements and lifestyle of the beneficiaries in the design brief of the housing unit
- Respect the opinions of the beneficiaries with

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<th>Top-Down Approach (Contractor-driven)</th>
<th>Bottom-Up Approach (Owner-driven)</th>
</tr>
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<tbody>
<tr>
<td>Project</td>
<td>PDH in Dinar</td>
<td>PDH in Çağkıri</td>
</tr>
<tr>
<td>Architect/</td>
<td>Official appointee</td>
<td>Official or private appointee</td>
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<tr>
<td>engineer</td>
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<tr>
<td>Builder</td>
<td>Large construction companies</td>
<td>Small contractors / unskilled labour</td>
</tr>
<tr>
<td>Project manager</td>
<td>Benefactor (Ministry)</td>
<td>Beneficiary (house-owner)</td>
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<tr>
<td>Material supplier</td>
<td>Known/contractual</td>
<td>Unknown / incidental</td>
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<tr>
<td>Cost</td>
<td>Within budget</td>
<td>Exceeded loan</td>
</tr>
<tr>
<td>Duration</td>
<td>As per schedule</td>
<td>Diverse limit</td>
</tr>
<tr>
<td>Housing type</td>
<td>Single type (standard design)</td>
<td>Diverse (Standard options and custom designs)</td>
</tr>
<tr>
<td>User participation</td>
<td>Headman consulted on new locations; other decisions by funding agency</td>
<td>Selection freedom (PDH design, architect, builders, materials and their suppliers)</td>
</tr>
</tbody>
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Table 1. Importance placed on the various aspects of renovation
regard to the location and design of the project
• Consider the climate and topography of the project location in the architectural design as well as in the site layout
• Ensure the continuity of cultural and historical heritage of the area and its people.

In the case of a bottom-up approach, following additional precautions are recommended:
• Provide technical assistance to the beneficiary and not just check the progress of the construction works to release payments
• Either provide the construction material as part of the aid or help establish a building materials outlet in the village that carries standard quality material and fittings
• Assess the skills and abilities of the beneficiaries and provide on-site training to those who can take part in the management or construction teams with a little guidance.
• Encourage active participation of the beneficiaries in all stages of the building work to ensure financial and psychological benefits.
• Provide extra funding to counter price hikes due to inflation.

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Abstract

Regenerated hanoks, Korean-style vernacular houses in Bukchon (North Village) of Seoul, have been celebrated as the successful examples of a hybrid dwelling integrating modern facilities in a traditional house form. While the modernization project during the postwar era encouraged South Koreans to live in high rise apartments, hanoks became one of the alternative residential options as urban forest of concrete high rises were perceived to be aesthetically unappealing as well as ecologically unsustainable. Hopes are high that remodeled hanoks can ameliorate not only dreary urban landscape but over-competitive and harsh everyday life conditions.

While preservation guidelines for regenerated hanoks provide residents with a possible stylistic model, it becomes questionable whether they are viable solutions given the proliferation of structures which seemingly adhere to the guidelines without considering local urban context. By pointing out the difference between the preservation guideline and its real life manifestations, this paper illustrates how imagined aspect of the vernacular architecture takes precedence over the experiential aspect. In this process of selective appropriation, various vernacular housing types are flattened into a standardized representation of upper class dwellings. This article concludes that it is possible to bring diversity by encouraging flexible interpretations of vernacular architecture and incorporation of residents’ memories in the design process.

Keywords: Vernacular House, Technology, Community Development, Historical Preservation, Tradition.

INTRODUCTION

Under the influence of the critical re-evaluation of urban renewal and modernist planning principles, conservation and adaptive reuse of traditional buildings have become more attractive. While most of the conserved structures had been mostly historically significant artifacts representing “high culture”, preservationists and practitioners began to be concerned about insufficient attention given to the preservation of vernacular architecture (Wyatt 1986). Especially in Third World countries with experiences of condensed modernization process, there is added urgency to develop a new prototype which integrates technology in vernacular house form to counter the dominance of nondescript concrete boxes for living. This paper examines the regeneration of hanok, Korean-style house, in Bukchon – meaning North Village - of Seoul as an example of such attempt to integrate the old and the new.

Effort to remodel deteriorating hanok to restore historicity of Seoul was materialized in the Bukchon Hanok Regeneration Project in 2000, which received UNESCO Asia-Pacific Heritage Award in 2009. Although many architects argue that living in remodeled hanok can be as convenient as apartment complex, the popular notion was that living in hanok can be quite inconvenient, given the difficulty of maintenance and high construction cost. Therefore, the project put forward plans to provide financial aid to those remodeling or constructing new hanoks in the area. After the initiation of the project, there has been a surge of interests in remodeling hanok in various cases including residential and commercial structures. In the regeneration project, engineers, architects, and local government cooperated together to formulate design guidelines designed to maintain the traditional ambience of the area while allowing some leverage for residents to make necessary repairs. Despite raising awareness of the potential of vernacular
architecture, the project also brought out conflicts when various cases of unorthodox constructions failed to consider local urban conditions while seemingly adhering to the design guidelines. Although design guidelines were formulated primarily as a possible stylistic model, its large scale application can generate unintended consequences. The case of Bukchon illustrates that objective of preservation plan cannot be achieved when lack of experiential aspect of a vernacular house results in the standardized design guidelines.

BUKCHON AND DEFINITION OF HANOK

Bukchon, located in the historical center of Seoul, refers to an area between Gyeongbokgung and Changdeokgung palace complexes (Fig 1). Positioned between the two palace complexes, it presented an attractive residential option according to Feng Shui principle. Natural landscape of the village was superior to other residential quarters in Seoul at the time. Located on a higher terrain farther away from the Cheonggye River, the area was not only safe from occasional eruptions but boasted a beautiful view of Bukak Mountain. Living in Bukchon also presented socio-political advantages. It was a desirable residential quarter for high officials of the literati class since its proximity to the monarch meant more political opportunities (Hwang 2005). Concentration of vernacular dwellings in the area has prompted the city government to describe the area as “street museum in the urban core” on the official website of the village (Seoul Metropolitan Government 2009).

Hanok, which literally means Korean-style house, commonly refers to various traditional Korean dwellings. Architectural characteristics of hanok include impermanence of materials and modular spatial organization. Stones were rarely used except for foundation of sites. Use of wood, tiles, and other impermanent material meant that replacements had to be made regularly. For instance, the tiled roof has to be replaced every 20 to 40 years while other materials such as thatched-roofs require shorter replacement time of one or two years. When a structure was destroyed by a fire or a war, destroyed components were replaced with new materials while intact parts were recycled. Today many centuries-old Buddhist temples are repository of rich construction histories with layers of meanings attached to each building part.

Spatial unit of hanok is called Khan (間), which refers to the space in-between two columns. The concept of khan was applicable to both length and area. For instance, if a building measures 3 khans by 2 khans, it has an area of 6 khans. The concept differs from a room in Western houses - an enclosed area with walls - since in hanok a room can be made up of different numbers of khan. Such modular organization of hanok meant there was more flexibility.

Despite such shared characteristics, there were wide variations of hanok according to socio-economic classes and regions. Typical upper class houses in the late Chosun Dynasty were composed of Sarang and Ahn compounds. While Sarang compound consisting of study and a reception room represented the “male” part of household, Ahn compound - literally meaning “inside” – represented “female” part of the household reserved for private matters. Upper class residences also featured a separate quarter near the main gate reserved for servants to answer the visitor’s call as well as tending household animals. In addition, an extra space dedicated to ancestor worship was needed in order to uphold filial duties specified in
Confucius ethics.

Since wooden post and beam houses were costly due to scarcity of materials, most commoners chose thatched roof houses since rice straw, the material for thatched-roof, was relatively accessible in agricultural regions (Fig 2). Thatched-roofs presented other advantages such as natural ventilation and moisture control. In other regions with less arable fields, different local materials were used. For instance, vernacular dwellings in mountainous Kangwon province use barks of oak trees as roofing material instead of glazed tiled roofs. In the island of Cheju, basalt rocks make up the fence/outer walls of the house compound. Basalt rocks, common in the volcanic island, help reduce the intensity of strong ocean breeze while at the same time protecting the courtyard from intrusions of livestock.

Despite the presence of diverse prototypes, it is easier to grasp the notion of hanok when it is imagined as the opposite of contemporary dwellings. Although the form of hanok implies the timeless accumulation of ancient building traditions, the term itself is new. The term hanok was included in Korean dictionaries in the middle of the 1970s in order to distinguish traditional houses from Western style houses (Kim 2003). Although the vernacular built forms associated with hanok were not “invented traditions” (Hobsbawm & Ranger 1983) since they were not factitious rituals, the act of lumping them together to create a new category of hanok was based upon their affiliation with the “imagined community” of the Korean nation-state (Anderson 1983). Thus, despite existence of countless varieties of Korean vernacular dwellings, the term Hanok becomes operable by invoking a common heritage shared by ethic-Koreans.

HANOK AS THE IMAGINED VERNACULAR

There exists no consensus with regard to what constitutes a vernacular house. The term vernacular architecture is defined by a set of “attributes of traditionality” (Rapoport 1989), “participation, engagement, and an egalitarian political ethic” (Glassie 1990), and “transmission of tradition” (Oliver 1989). While the commonly held notion of a vernacular house associates the term with traditional forms, a vernacular house does not necessarily exclude modern elements. Habraken went even further, by noting that there exists no fundamental discord between mass produced components and vernacular building system (Habraken 1985). Implicit design principles of traditional hanoks bear many things in common with those of Open Building movement, which promotes adaptability over time and a higher level of user control (Open Building Foundation 1991). In the case of hanok, such high level of ambiguity is confounded since the very nature of hanok construction necessitates replacement of materials. Impermanence of material is one of the characteristics of hanok, making its regeneration not an exceptional event but ever recurring routines to be dealt with. In such a context, the concept of preservation becomes obscure since replaced parts, which reflect developing technologies, inevitably introduce altered flavors. Thus, instead of dichotomous relationship between the vernacular and the contemporary, this paper takes the definition of the vernacular as both imagined and real experiences of traditional lifestyle regardless of what material it utilizes. The
case of Bukchon represents the process which imaginative component dominates over the experiential one, at least partly due to the way preservation guidelines are formulated.

How regenerated hanoks are imagined to be vernacular can be glimpsed from the portrayal of hanok in various popular media. One of the factors behind the recent surge of “Hanok Renaissance” is a mounting criticism towards the monotonous and dull urban landscape of Seoul, or “apartment forests,” consisting of endless rows of rectangular concrete boxes. In contrast to aesthetically unappealing and ecologically unsustainable concrete boxes, remodeled hanoks (Fig 3) were hailed as examples of more balanced and responsible lifestyle.

For instance, portrayal of residences in remodeled hanoks, reflected in popular magazines and newspaper, hinges upon the idea of dialectics between two opposing forces such as material and immaterial, technology and spiritual, fast paced urban life and leisurely slowness. Despite residual impressions of hanok’s incommodiousness, popular media introduced interviews with the residents of remodeled hanok to illustrate that living in urban hanok is not as radical as it seems. Simplicity generated by structural characteristic of hanok is appreciated as embodying an aesthetic of emptiness. The lack of color and absence of decoration in paper screen walls and doors have been hailed as reflecting the core Taoist belief in “non-action”. Instead, features of natural beauty were framed in a very purposeful way, by surrounding it with emptiness and accentuating it. Too much artificiality or construction is discouraged as interfering with meditation. Such harmonious coexistence of design and non-design within architectural language of hanok was praised as a philosophical statement which “simultaneously sought to overcome the limits of artificiality and inactivity” (Kim & Kwan 2004: 7).

While minimalist aesthetics believed to be inherent in traditional built forms are understood as the alternative to excessive intentionality, they are also imagined to possess a moral dimension. Simplicity as a rejection of extravagance is “an expression of elite literati’s philosophy emphasizing graceful and restrained lifestyle rather than luxurious or indulgent attitude” (Society of Hanok Gonggan 2004: 259). In a similar vein, willingness to put up with small inconveniences is celebrated as an evidence of independence and mental fortitude. Maintenance of existing hanok structure, not withstanding new construction, involves much more work than living in an apartment complex with 24-hour security guard-cum-repairman. In other cases, new meaning is attached to more specific architectural features previously regarded as irksome. A newspaper article introduced a journal written by a mother who noted that while her children tripped at high door threshold in the beginning, they soon learned to avoid falling which reminded her of an argument that living in hanok is conducive to cultivation of careful behavior (Kim 2009). Although the high door threshold is not intended to promote careful behavior, it is imagined to impregnate children with fastidiousness. In another case, handling paper sliding-doors, which often requires slow and careful maneuvers, is cited as an example which teaches the children to seek a roundabout solution rather than using a sheer force (Cho 2009: 21). Overcoming minute annoyance is rendered as heroic attempt to break out of banal modern life enslaved by addiction to technology.

In addition to curing over-reliance on technolog-
gy, living in hanok is imagined to promote social interactions among residents. Hanok’s association with pre-industrial mode of living has generated expectation that open spatial layout of hanok will strengthen social ties among neighbors. Insook Park, who currently manages hanok accommodation in Bukchon, noted that one of the reasons she moved to hanok was because of her childhood memory of affectionate village community (Oh 2009). Another resident explained that their decision to move to Hanok was made after he saw the sketch of his child depicting his home. The child’s portrayal of his home as a cold concrete box alarmed him enough to decide to move. It is feared that while the older generation can retain some memory of idyllic traditional life, younger generations would never experience the sense of community if they continued to live in high-rise apartments.

However, residence in hanok does not guarantee tightened social relationship among neighbors, let alone the rest of traditional lifestyles. While the process of imagining traditional value is the important aspect of vernacular house, such spiritual dimension is not reflected in the actual lived experiences. Contrary to the belief that the value of elite literati is inherent in hanok, many contemporary urban hanoks in Bukchon are designed to support affluent contemporary upper class lifestyle.

**PRESERVATION DESIGN GUIDELINE**

Close association between hanok and upper class lifestyle can be glimpsed in the repair standard jointly prepared by the city government and HAUD Architects, Planners & Engineers. Since one of the aims of the Bukchon Regeneration Plan was historical preservation, the city prepared repair guideline which could prevent emergence of unconventional hanoks. The repair standard only specified design guideline for tiled roof hanoks, with even more specific guidelines for the treatment of outside walls adjacent to streets. As such, it selectively appropriated and flattened various forms of hanok into standardized type of historical upper class residence. According to the guideline, outside walls are to be divided into three parts, with upper part consisting of paper screen windows and plasters, middle part being either red brick or cobble stone, and lower part consisting of larger granite stone. The resulting façade is a fire wall composed of rustificated stone base, brick, and plaster walls juxtaposed together. Such outside wall treatment is advantageous since it not only resists fire and water, but possesses excellent insulation qualities.

Hanok depicted in the repair guideline (Fig 4) shows a wall with moderate height, with lower part of rustificated foundation occupying a small portion. According to the guideline, it is recommended that the height of the outside wall is about the middle height of neighboring wall, with the main structure of Hanok appearing over the wall (Seoul Metropolitan Government 2001). However, even when guideline was meant to promote safety and contextual conformity, architectural practices of Bukchon illustrate that they do not always correspond to the intentions of the design experts. The guideline has been manipulated in several cases to raise the embankment in advance and enlarge the foundation disproportionately to support posh lifestyles (Fig 5). Although most of the unorthodox hanoks follow the tripartite wall composition depicted in the guideline, the proportions are negotiated to accommodate built-in-garages.

Several newly constructed hanoks become...
fortress-like structures with a hint of traditional form such as tiled roofs. To a certain extent, such unconventional treatment of façade is due to the cramped urban condition which does not allow enough space for a courtyard. Others note that urban hanoks are fundamentally different from hanoks in the earlier period since the prototype continues to adapt to the process of urbanization and industrialization. While this observation supports a more flexible interpretation of tradition, it alone cannot account for the stylistic uniformity in Bukchon. Notwithstanding the fact Bukchon was a popular residential district for upper class literati, there was no strict segregation according to class which means that diverse house types co-existed. In fact, even during the Chosun Dynasty, numerous distinct vernacular dwelling types such as log cabins, thatched roof houses, and shingle-roofed houses were common.

LOCAL URBAN CONDITIONS

Despite relatively slower urban growth of historical part of Seoul, the area near Bukchon has seen many commercial developments. For instance, fifteen-story-high Hyundai Building, constructed in 1986, abuts the edge of Bukchon (Fig. 6). Another large structure is the Constitutional Court, also constructed in the 1980s causing demolition of old hanoks in the area. Establishment of large commercial and governmental agencies prompted development of small businesses such as restaurants and cafes. Recent designation of the area as a historical cultural district, where reconstruction of more than four stories is forbidden, has resulted in a series of legal battles between corporations and the city government. Spatial experience of the village is compounded by commercial development of Insadong, area south to the village famous for traditional antique shops and art galleries. Spill-over developments from Insadong, another special cultural district of Seoul, have permeated into the formerly quiet residential area. Surrounded by sites of cultural heritage, the village is vulnerable to speculation and gentrification.

What is noteworthy is that in this process of constructing upper class dwellings with full amenities, conflicts between neighbors escalate. Although the use of tiled roofs and wooden columns seems to show attempts to blend into the neighborhood, it is clear that such gesture stops short of tokenism when massive wall and broadened road disrupt the traditional relationship between hanok and streets. The unconventional construction method produced friction between the existing residents who suffered from the high level of noise coming from the construction sites. Others observed the process of gentrification when previous residents in Samchung-dong part of the village sold their houses to the rich outsiders after the sharp rise in land price (Lee 2008). In addition, division between NGOs after the beginning of the regeneration project is pointed out as contributing to the process of community’s disintegration (Lee 2006). Ironically, the effort to revitalize vernacular house form has resulted in perverse transformation of hanok. At the same time, the dream of cultivating idyllic communitarian neighborhood proved premature when construction of fortress-like hanok contributed to the conflicts among residents.
CONCLUSION: FUTURE OF HANOK

The future of urban hanok remains uncertain. Controversies surround the definition as well as scope of hanok. While the preservation guideline is designed to promote vernacular houses by integrating technology into traditional forms, they are not effective in preventing cases which seemingly adhere to guidelines without substantial consideration of local urban context. Ironically, efforts to develop alternative housing type have produced negative externalities such as increased conflicts among neighbors and gentrification. At the same time, narrow definition of hanok in the guideline encouraged stylistic uniformity.

However, urban hanoks do not have to remain as cultural artifacts to avoid becoming an excuse for new constructions of fortress-like villas. First, current definition of hanok in the guideline as “wooden structure with tiled roof” has to be rearticulated to allow flexible re-interpretation of vernacular house. Although intricate restoration guidelines are designed to prevent sprouting of unorthodox structures, presence of fortress-hanoks illustrates that such guidelines can be easily avoided. Rather, what is needed is a greater level of participation by residents themselves in determining the type of a vernacular house they wish to build. As things stand now, residents have to resort to tiled roof hanok in order to qualify for financial aid even if they wish to build different types. Considering that most of Koreans had lived in thatched-roof houses, such measure harms the preservation of diverse types of vernacular houses. Other types of hanok such as thatched-roof structures and bark roofs should not be excluded just because they present higher maintenance work.

Second, incorporating resident’s memory of living in hanoks can supplement the lack of stylistic diversity. When considering vernacular house forms, various types of information such as informal correspondences should supplement formal documents. Disproportionate reliance on formal documents can lead to negative consequences. Currently, regenerated hanoks observing the aesthetics of the guidelines stop short at replicating the exterior of traditional forms without considering the experiential component. For instance, floor plans of remodeled hanoks show strict separation of functions just like modernist apartment instead of reflecting flexible utilization of space, which is the main characteristic of hanok. Although traditional multi-purpose spaces such as Daechung, main floored hall, replace living room in contemporary hanok, strict functional differences among kitchen, bathroom, and bedroom remain.

Just as it is absurd to suggest that there is one single definition of a vernacular house, it is unreasonable to suggest that a priori category of hanok exists within Korean society. Hence, it is necessary to restore the balance between imagined and lived aspect of a vernacular house. Only tireless effort to integrate diversity within the vernacular can bring a meaningful application of tradition in contemporary dwellings.
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A ‘FAREJ-IN-THE-SKY’: TOWARDS A COMMUNITY-ORIENTED DESIGN FOR HIGH-RISE RESIDENTIAL BUILDINGS IN THE UAE

Khaled Galal Ahmed

Abstract

Most of the native citizens in the UAE live in public or private single-family houses. Given the tremendous cost of developing this type of housing and the inability of providing single-family houses to cover all the current and future needs for public housing, high-rise residential buildings seem to offer an alternative. But the question is; does this type of housing suit the local communities in the UAE, especially in light of the failure of the previous western experiences? Through addressing this question, the research proposes an approach towards a community-oriented design for high-rise residential buildings in the UAE.

The research first investigated the reasons behind the community-relevant shortcomings of the traditional high-rise residential developments in the West. Afterwards, it briefly reviewed the status quo of the community-relevant considerations in the design of the recently built high-rise residential buildings in the UAE, where it has been found that little concern has been devoted to the community needs. In an effort to find an answer to this problem, the research examined four recent design experiences as examples for the current universal efforts to design community-responsive high-rise residential developments. Some conceptual approaches were derived from these experiences that are envisaged to help reach an approach for the case of the UAE. Nonetheless, because of the unique social and cultural traits of the UAE native society one cannot rely on these global conceptual approaches alone. Instead, the research proposes an approach that, while benefiting from the relevant global experiences, is chiefly pivoted on the vertical reconfiguration of the idea of the ‘fareej’ as the smallest unit in the residential urban context both traditionally and in the future official urban plans in the UAE.

Keywords: fareej, high-rise, residential, community, UAE.

1. INTRODUCTION

Although there is no precise definition that is universally accepted, the high-rise structures are generally defined as structures over 10 or more stories high (Wener and Carmalt 2006). Emporis Standards (2010) defines a high-rise building as a structure whose architectural height is between 35 and 100 meters. On the other hand, there is a growing debate about the ability of high-rise residential buildings to accommodate the growing demand for urban housing because, in many cities of the world, space becomes ever scarcer and, hence, higher density inner city housing becomes a priority. Worldwide, a variety of high-rise housing has been built. This ranged from the large public housing estates in the 1960s and 1970s, to the more recent luxurious high-rises in up-market central districts. All current indications seem to point towards the continued construction of high-rise residential buildings (Yuen 2005). It is argued that luxurious, slender, sustainably developed, good quality high-rise housing could provide a good living environment (Bouw 2004) and it is believed that high-density vertical communities are the most sustainable living solution for the future (Jan and Norr Group 2009). Baker (2010) stated the argument of Antony Wood, the Urban Habitat executive director that, “It is only in the intensification of our cities and the inclusion of mixed urban-public facilities in the sky that the true vibrant, dense cities of the future can be realized.”

Nonetheless, the world experience in the past revealed failure in accommodating community needs. In more recent Western cases, the community-relevant considerations of the design of the high-rise residential buildings have been compromised from the outset as the designers, in many
cases, have been exclusively occupied with functional issues, architectural features and/or energy conservation. Just to mention a few examples: 930 Poydras Residential Tower, Louisiana, New Orleans, USA (Minner 2010), Residential Glass Tower, Los Angeles, USA (World Architecture News 2008) and Turning Torso Residential Tower, Malmö (Design Build Network 2010). Furthermore, the mainstream international research about high-rise residential buildings is currently focusing on environmental sustainability, with little concern about the community social and cultural aspects (see for example: Niu 2004, Lai and Yik 2009, Baldwin et al 2008, Guertler and Smith 2006). Wener and Carmalt (2006) add that there is limited research on human behavioral and social responses to issues of sustainability in buildings in general, and even less so for high-rise buildings.

Led by multinational property development firms such as Emmar, Al Dar and Nakheel, the UAE has witnessed accelerated development of high-rise residential buildings, albeit with a slower pace after the world economic crises in 2008. The shortage in the number of housing units in the UAE which was expected to reach to 27900 units in 2010 (DED 2010) increases the demand for high-rise residential buildings. This need on the one hand, and the social failure of some world examples of high-rise residential buildings coupled with the negligence of the social and cultural aspects in the contemporary designs of residential towers in the UAE, on the other hand, poses the research main question: “how can the design of high-rise residential buildings in the UAE be more community-oriented?” In this research community is defined according to the Cambridge Dictionary (2011) as the people living in one particular area or people who are considered as a unit because of their common interests, social group or nationality. In this case, the UAE native communities living, or would live, in high-rise residential buildings are the target. Community-oriented design in this research means the design which considers the unique social, cultural, functional and environmental needs of the local community for which it is going to be applied.

To tackle the research question, the research begins with a brief investigation for the reasons behind the societal failure of high-rise residential buildings in the West. Then, the research undertook a brief review of the status quo of community-relevant dimensions in the design of high-rise residential buildings in the UAE. Afterwards, the research examined some recent different design initiatives for achieving community-oriented design in this type of housing through four approaches in different parts of the world. Based on both the lessons learnt from these global initiatives and the local dimensions of housing design in the UAE, especially the fareej traditional housing pattern, a new theoretical framework that might contribute to realizing the needs of the native UAE communities is proposed. The adopted method of the research is mainly qualitative and relied on the analysis of the community-relevant issues in the design of high-rise residential buildings. Case studies were utilized, when relevant, especially in investigating the societal failure of the high-rise residential developments and the recent approaches about community-relevant aspects in the design of them.

2. COMMUNITY-RELEVANT PROBLEMS OF THE DESIGN OF HIGH-RISE RESIDENTIAL BUILDINGS

In general, the community-relevant problems associated with the past experience of high-rise residential developments, especially in the West, included children’s safety, crime, depersonalized living spaces and phobias (Yuen 2005). A clear example for those problems is the St. Louis’s Pruitt-Igoe high-rise development. Pruitt-Igoe, completed in 1956, followed the planning principles of Le Corbusier and the International Congress of Modern Architects, in keeping the grounds and the first floor free for community activity. “A river of trees” was to flow under the buildings. Each building was given communal corridors on every third floor to house a laundry, a communal room, and a garbage room that contained a garbage chute. Unfortunately, the river of trees soon became a sewer of glass and garbage. The mailboxes on the ground floor were vandalized. The corridors, lobbies, elevators and stairs were dangerous places to walk. They became covered with graffiti and littered with garbage and human waste. In 1972, after spending more than $5 million in vain to cure the problems at Pruitt-Igoe, the St. Louis Housing Authority...
demolished three of the high-rise buildings. A year later, in concert with the U.S. Department of Housing and Urban Development, it declared Pruitt-Igoe unsalvageable and razed the remaining buildings (Newman 1996). The idea of adopting high-rise residential development from the outset has been blamed as a cause for this failure. Hoffman (2007) mentioned that one popular theory blames Le Corbusier, and his influential conception of a modernist city of high-rises.

Lack of security, according to Neman (1996), is a persistent social problem associated with high-rise residential buildings. He claims that the placement of the high-rise towers on the interior grounds usually produces a system of off-street parking and access paths to the building that involves many turns and blind corners. Therefore, residents in such developments will suffer from the dangers of walking into the grounds to get to their buildings at night. The outside grounds, because of their disassociation from any of the individual units can only be designated as public. The grounds of the development that abut the sidewalks are also public, and, consequently, so are the sidewalks and streets. All the grounds of high-rise residential buildings must be maintained by management and patrolled by a hired security force. The city streets and sidewalks, in turn, must be maintained by the city sanitation department and patrolled by city police. Furthermore, Newman indicated that among the physical factors, which contribute to crime rates, is the building height or the number of units per entry that affects the ability of residents to control their environment. He explains that the higher crime rate, usually experienced by residents in large multifamily dwellings, is mostly attributable to the occurrence of robberies in the interior common-circulation areas of multifamily buildings. Smith (2007) argues that when the public space is enclosed such as in an elevator, a stairwell, or a long high-rise corridor an unsafe environment is created.

Complexity and anonymity of the housing environment have been also considered as factors contributing to the societal problems of the design. In such a housing environment it is more difficult for a code of behavior following societal norms to become established among residents (Newman 1996). In a study which investigated the relationship between the design of high-rise housing complexes and the residents’ social interaction in Taipei, Taiwan, it has been found that only 15.63% of the total observed residents have social interaction with others. The findings reflect the phenomenon of social withdrawal among the residents (Huang, 2006). In relation to space control, Newman (1996) argues that a family’s claim to a territory diminishes proportionally as the number of families who share that claim increases. The larger the number of people who share a territory, the less each individual feels rights to it. When the numbers increase, the opportunity for reaching such an implicit understanding diminishes to the point that no usage other than walking through the area is possible, but any use is permissible. Therefore, it is easier for outsiders to gain access to and linger in the interior areas of a building shared by 24 to 100 families than it is in a building shared by 6 to 12 families. The following section briefly highlights the consideration for community values and traditions in the design of high-rise residential buildings in the UAE.

3. COMMUNITY-RELEVANT CONSIDERATIONS IN THE DESIGN FOR HIGH-RISE RESIDENTIAL BUILDINGS IN THE UAE

Presently, providing public housing for natives in the UAE is still through one to two stories single-family houses (SZHP 2010 and MRHE 2010). Meanwhile, the current designs for the high-rise residential buildings in the UAE, which has become an iconic figure for many cities in UAE including Dubai, Abu Dhabi, Sharjah and Ajman, are not considering the native community needs. Rather, they are mainly built for the expatriate high-class employees and foreign investors. When investigating the status quo of the designs of the high-rise residential buildings in the UAE, (see for example, Highrise Properties 2010, Emaar 2010 and Sorouh 2010), it is easy to realize that actually almost no real concern was given to social and cultural aspects of the local community in the design. Figure 1 is an example of the widespread conventional design for these prevailing styles of high-rise residential buildings in the UAE. Usually the residential tower encompasses...
typical floors with standard plans for studio, one-, two- and three-bedrooms flats. This pattern depends mainly upon economic considerations of using every meter efficiently as a habitable space. In light of the current shortage of housing units in the UAE, the growing demand for housing and the insufficient serviced housing plots (DED 2010) the question now is how to develop such pattern, from the community considerations’ point of view, to attract natives away from the currently-adopted conventional one or two-story single family houses?.

4. OVERCOMING COMMUNITY-RELEVANT PROBLEMS IN THE DESIGN OF HIGH-RISE RESIDENTIAL BUILDINGS: A REVIEW OF SOME RECENT DESIGN INITIATIVES

The following three design initiatives represent distinctive approaches in different parts of the world that aim at incorporating community considerations into the design of high-rise residential buildings. The first approach is for a stand-alone high-rise residential building while the second is composed of three towers and the third of eight towers. Each of these approaches is adopting its own design strategies to reach to a community-responsive design. Some concepts, derived from these initiatives, are conceived applicable to the case of the UAE and are used later in this research to help answering the research main question.

4.1 Herzog & de Meuron’s approach: “Houses stacked in the sky”
The 2008 Herzog & de Meuron’s design for the 56 Leonard Street high-rise residential 57 storey condominium building (Fig. 2) will house 145 residences, each with its own unique floor plan and private outdoor space, in a veritable cascade of individual homes that the architects describe as “houses stacked in the sky”. The flats range in size from 133 sq. m. to 593 sq. m. and will include two- to
five-bedroom residences and 10 penthouses. The tower contains five key zones ascending from street to sky: lobby, “townhouse” residences, amenities, tower residences, and penthouses.

For security, the lobby space includes stations for a 24-hour doorman and concierge, with custom designed reception desks by Herzog & de Meuron. The reception hall also encompasses private residents’ mail, package and refrigerated storage room; custom-designed visitor seating fixtures; and two separate elevator landings with a total of seven elevators featuring interiors designed by the architects (Dezeen 2008).

Regarding residents’ identification with their living place and satisfying their own individual needs, it is argued that the building breaks down the conventional image of the high-rise building as a sleek, hermetically sealed urban object and proposes instead a pixilated vertical layering of individually sculpted, highly customized, graceful private residences opening to the atmosphere (Fig. 2) (Architecture Plus 2009). Davidson (2008) commented that in modifying Mies with a touch of the baroque, the architects have adapted the suburban home to a vertical habitat without losing its uniqueness. No two floor plans are identical (Fig. 3). Part of the plan of the tower is to design each of its units, or at least each of its 57 floors, as though it were a distinct one-story suburban house, but of a specific kind. Furthermore, for providing more privacy, penthouses are accessed by private elevators (Gardner 2008).

To provide spaces for needed amenities and social interaction among residents, the tower has two full floors (the 9th and 10th floors) of amenities spaces custom designed by Herzog & de Meuron. These include an indoor/outdoor 22.5 m. infinity edge pool, an adjoining outdoor sundeck cantilevers, 6 m. over the block to provide extraordinary Tribeca neighborhood views and a sense of connection to the district. Other amenities include a fitness center with yoga studio, wet and dry spa features and terrace; a library lounge; a screening room; a private dining/conference room; and a Tribeca Tot Room for children’s play and family activities. The tower has been designed to create visual access to the cityscape for those inside the building and aesthetic excitement for passersby on the street (Dezeen 2008). To associate the building with the surrounding streets and urban context, the
design creates a relationship between the ‘private’ tower and the ‘public’ streetscape with an articulated base whose cantilevers generate a sense of movement and permeability (Fig. 3b). Herzog & de Meuron mentioned that they considered the relationship between their building and the Tribeca neighborhood through the dialogue resulting from the different scales that characterize the neighborhood (Dezeen 2008).

4.2 TR Hamzah & Yeang’s approach: "City-in-the-sky"
Designed by TR Hamzah & Yeang in 2000, the Elephant & Castle Eco-residential Towers in London consist of three towers. The first is 35 stories and the second and the third are 12 stories (Fig. 4). The main theme of the design, as described by the designers (Yeang 2007), is that it takes the model of a general geographical area of a city, with its inherent systems, zoning and social infrastructure and inverts it into skyscraper buildings. Thus, the skyscraper and its retail and commercial base is seen as a microcosm of the city, containing within itself the inherent elements of a city block, i.e. parks, shops, entertainment centers, community facilities and housing.

The community-relevant considerations of the "City-in-the-sky" approach included different features. The design considered urban connectivity to immediate urban context as it includes a high-level bridge over the proposed railway station and direct connections onto the garden terrace and into the retail zones. Social integration among residents was considered through the creation of a healthy mix of residents within the same building and the shared public facilities.

This mixture of residents from different ages, occupations and family structures are accommodated by the provision of a variety of accommodation types, including studio apartments, 2-room apartments and penthouses (Fig. 4). Common facilities, including secondary and tertiary landscaped open spaces and sky pods within groups of housing in the form of sky courts and communal pods as well as shopping streets and other public amenities, are shared. Furthermore, the units are of close proximity to basic amenities, such as the local grocery store, postal boxes, chemist, etc. These are all located within the ground development and/or

Figure 3 a&b&c. Individual housing unit plan in each floors. a; 7E, b; 46W and c; 18BE plans, as examples (Source: 56 Leonard Street Building 2010).
within the tower (Yeang 2007). The privacy of the residents was considered through the spatial progressions of public open spaces (parks in the sky) to semi-private (entrance courts) to private open spaces (balconies) (Fig. 4). Each housing unit has its own entrance lobby, light wells and balconies. The designers also allocated a set of elevators for each social group where low-rise elevators were allocated for social/subsidized housing, while the mid- and high-rise elevators were allocated for the better-off residents (Fig. 4 a).

The creation of a healthy landscaped environment was considered through the configuration of the tower with a weather-protected central landscaped core that helps enhance the quality of life of the residents. In addition, the orientation of the tower maximizes the solar heat gain into the interior spaces in winter and mid-seasons, and maximizes solar shading in the summer. Vegetation and landscaping within the private gardens and sky parks in the towers act as a wind buffer while giving users a more humane environment. In summer, vertical landscaping acts to obstruct, absorb and reflect a high percentage of solar radiation thus reducing ambient temperatures. The damp surfaces of grass and soil will also contribute to a cooler and
healthier building. Finally, Yeang (2007) advocated his adopted mixed-use design paradigm as it would help provide the opportunities for local employment, both on ground and upper levels. Furthermore, he mentioned that the location of housing in close proximity to employment, retail, leisure and community facilities reduces reliance on public transportation.

4.3 Steven Holl Architects' approach: Linked Hybrid
Completed by 2009 in Beijing, China, the Linked Hybrid is a high-rise residential development designed by Steven Holl Architects. The mixed-use housing complex is composed of eight 22-story asymmetrical towers joined by a network of enclosed pedestrian bridges and consists of 644 apartments, public green space, commercial zones, hotel, cinemateque, kindergarten, Montessori school, underground parking on a total area of 221,426 Sq. meter (Steven Holl Architects 2009) (Fig. 5).

The designers paid attention to many dimensions relevant to the local community in their design. In terms of the association with the immediate urban context and social interaction and integration, the Linked Hybrid has an open, communal spirit where a series of massive portals leads from the street to an elaborate internal courtyard garden, a restaurant, a theater and a kindergarten, integrating the complex into the surrounding neighborhood (Fig. 5). This pedestrian-oriented project is sited adjacent to the site of the old city wall of Beijing and aims to counter the current privatized urban developments in China by creating a new porous urban space, inviting and open to the public from every side. This makes the Linked Hybrid an "open city within a city" (Steven Holl Architects 2009). Baker (2010) mentioned that the residential complex offers a more pervasive and open sense of neighborhood than the most other modern high-rise housing in the city (Fig. 6). Baker added that the Linked Hybrid is shaped by the architects' wish to forge connections both among the residents themselves and among them and their neighbors and visitors. The ground level offers a number of open passages for all people (residents and visitors) to walk through. These passages ensure a micro-urbanisms of small scale. All public functions on the

Figure 5 a&b&c&d. Linked Hybrid is the Beijing's new high-rise residential project (Sources: a; Steven Hall Architects 2009, b; www.livegreen.com, c and d; www.wayfaring.com).
Neighborhood

![Figure 6. Development of the high-rise scheme as a neighborhood in the sky (Source: www.archdaily.com).](image)

ground level have connections with the green spaces surrounding and penetrating the project.

Furthermore, the public spaces in the project, which vary from commercial, residential, and educational to recreational, promote interactive relations among its residents and encourage encounters. Shops activate the urban space surrounding the large reflecting pond. The multi-functional series of large sky bridges located between upper floors of the 14 to 21 stories, are conceived as a continuous ring of public zones (Fig.7). Each of these sky bridges has been made functionally distinctive as one has a cafe shop, another has a swimming pool, a third has a small auditorium and so on. The designers hope that the public sky loop and the base loop will constantly generate random relationships. They will function as social condensers resulting in a special experience of city life to both residents and visitors. The idea of the street high above the city intended to counteract the sense of isolation that high-rise living usually brings, and to create an incentive for residents to walk around the complex (Steven Holl Architects 2009). This effectively increases the effectiveness of the residents' surveillance over their residential development.

Landscaped spaces help to enhance environmental living conditions. On the intermediate level of the lower buildings, public roof gardens offer tranquil green spaces, and at the top of the eight residential towers private roof gardens are connected to the penthouses. Outside the ring of towers stands a series of gardens inspired by a stage of life. The “childhood” mound covers the kindergarten, knitting it to the ground. Other mounds integrate recreational facilities, including a basketball court and skate park for “adolescence,” and tennis courts, a tai chi platform, and a public tea house for “middle age.” Some functions are actually housed within, such as the meditation space inside the “mound of infinity” (Baker 2010).

The architects also gave some thought to the project's cultural assimilation. The design for the “mound of infinity” meditation area includes pavilions dedicated to the “five elements” (earth, wood, metal, fire, and water) of ancient Chinese cosmology. More intrinsic to the design process was the use of the number eight, considered lucky in Chinese culture. The architects tried to integrate it repeatedly in both the number of the residential towers and in the color scheme where the post-modern facade combines light colored sanded and anodized aluminum with eight luminous colors inspired by China's old temples and monuments. The architects used the divination system from the classic Chinese text the I Ching to choose the colors (Baker 2010).

In conclusion, the three previous projects depict some of the current global design initiatives in realizing community-responsive high-rise residential development. Table 1 summarizes the design tools used by these initiatives to rectify the inherent com-
community-relevant problems in conventional high-rise residential buildings.

Actually, in the attempt to achieve community-responsive design for high-rise housing buildings in the UAE and in light of the specific social and cultural traits and values of the UAE natives, one cannot rely direly on the previous global initiatives in a cut-and-paste manner. This, with no doubt, would mislead the whole process and would presumably end up with contradictory results. Rather, fruitful lessons can be learnt, not from the specific forms of these design initiatives, but from the notions and concepts behind them, which can pave the way towards establishing a theoretical framework for the aimed design. This can only happen when taking the locality of the UAE society into consideration. The following section examines a recent design approach tailored for Middle Eastern cities, including the UAE ones and thus discusses its relevancy and sufficiency for the UAE case.

SEARCHING FOR A LOCAL FORMULA: CAN THE NORR GROUP’S APPROACH “THE HABITAT MODEL” ANSWER THE QUESTION OF RELEVANCY FOR THE UAE?

The 2009 Habitat Model is about 30 floors high complex and proposes a mixed-use development that includes residential, office, hotel and retail spaces. The residential component occupies two corners of the complex and consists mainly of floating elements embedding landscape and public spaces. The office components and the hotel component are occupying the other corners interweaving with each other and with the residential one (Figs. 8 and 9) (Jan and Norr Group 2009).

The project, as claimed by its designers (Jan and Norr Group 2009), came as a response to what they called the need to develop a new model for dense living and the need to create a sense of
### Table 1. Summary of the proposed design solutions for the community-relevant problems as proposed by the three design initiatives (Source: by the author).

<table>
<thead>
<tr>
<th>Community-relevant problems inherent in conventional high-rise residential buildings</th>
<th>Herzog &amp; de Meuron’s Approach: “Houses stacked in the sky” (stand alone tower)</th>
<th>TR Hamzah &amp; Yeang’s Approach: “City-in-the-Sky” (three towers)</th>
<th>Steven Holl Architects’ Approach: “Linked Hybrid” (eight linked towers)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Insecurity and high crime rate.</td>
<td>One lobby space includes stations for a 24-hour doorman and concierge.</td>
<td>Spatial progressions of public open spaces (parks in the sky) to semi-private (entrance courts) to private open spaces (balconies).</td>
<td>Community surveillance through increasing encountering opportunities.</td>
</tr>
<tr>
<td>2. Inappropriate code of behavior.</td>
<td>Space control through eliminating the number of houses in each floor.</td>
<td>Space control through hierarchy of spaces from private front and backyards to public circulation zones.</td>
<td>Conventional security personnel in each tower lobbies.</td>
</tr>
<tr>
<td>3. Lack of residents’ identification with their place.</td>
<td>Unique plan for housing units. Private outdoor space for each housing unit.</td>
<td>Various housing units plans. Private outdoor space for each housing unit.</td>
<td>Well-defined private (residential) and public use zones.</td>
</tr>
<tr>
<td>4. Absence of social interaction among residents.</td>
<td>Providing spaces for shared amenities in two full floors.</td>
<td>Providing spaces for shared amenities in the ground floor and/or within the tower.</td>
<td>Chinese cultural aspects in the design (colors, number 8, Chinese cosmology).</td>
</tr>
<tr>
<td>5. Disassociation between the tower(s) and the surrounding urban context.</td>
<td>Artistic sculpture defining the tower’s entrance. An articulated base whose cantilevers generate a sense of movement and permeability.</td>
<td>A high-level bridge over the proposed railway station. Direct connections onto the garden terrace and into the retail zones.</td>
<td>Unique housing identity.</td>
</tr>
<tr>
<td>6. Violation of residents’ privacy.</td>
<td>Eliminating the number of houses in each floor. Allocating private elevators for penthouses.</td>
<td>Spatial hierarchy of public open spaces (parks in the sky) to semi-private (entrance courts) to private open spaces (balconies).</td>
<td>Connection to the surrounding streets through massive portals.</td>
</tr>
</tbody>
</table>

Community centered on shared public and landscaped spaces in the Middle East Cities and thus introducing the idea for “neighborhood parks in the sky” (Fig. 8). These shared spaces are intended to act as catalysts for creating a community identity within a large living space. The whole complex is sharing a retail souk (traditional shopping center) environment in the base. The vertical public spaces and landscape are distributed connectively on all the four parts of the project. Vertical cores are used for services, vertical circulation and also work as supports for the floating habitable bridges (Fig. 9). The four components are capsulated in an external structure ‘veil’ (Fig. 8 a,b and Fig 9) which provides solar energy collection, through photovoltaic panels spread throughout the exterior screen, and aid-
ing as a shading device. As the main concern was devoted to environmental sustainability, the designers argue that energy consumption inside the matrix is shown to be significantly less than an average tower complex.

The main significant differences that the Norr’s approach provides, if compared to the conventional designs for high-rise residential buildings in the UAE as mentioned above, are, first, the environmental consideration represented in the PV veil that surrounds the whole complex. Second, is the introduction of the idea of the vertical shared public landscaped spaces that work as a catalyst for residents’ interactions. Third, is the design for a mixed-use development. These with no doubt are essential issues in the “design for the community” approach but there are still other crucial issues that have not been considered in the proposal and which rigorously hinder the claim that this approach is a sound community-oriented one relevant to the high-rise residential buildings in the UAE. These issues include; the lack of space control due to the total space integration among different uses (residential-office-hotel) especially on the upper levels and the resultant violation of the residents’ privacy, which is a very essential component of the residential context for the UAE natives. Space hierarchy from public, semi-public, semi-private and private, which consequently means space control, is also not clear in this approach. This jeopardizes the important measure of security of residents of the complex. Another communityrelevant problem in the proposal is the disassociation between the complex and its urban surrounding. The proposed veil is intensifying this sense of isolation. The solution also did not depict the design of the house-in-the-sky and how it would response to the unique needs of the inhabitants. Therefore, there is still a need to search for a more developed approach, which is responsive to the native UAE society. The following section presents the idea of the traditional, and yet newly advocated, fareej as a base for the proposed approach.

Figure 8 a&b&c. The Habitat Model by Norr Group (Source: Jan and Norr Group 2009).
THE ‘FAREJJ’-IN-THE-SKY: INTEGRATING LOCALITY IN THE DEBATE

The vertical arrangement of the local urban housing pattern of the traditional fareej is proposed here as the answer for the reconciliation between locality and globalism in the question of community-oriented high-rise buildings in the UAE. The fareej is the smallest unit of the traditional Emirati settlements. It is a housing system composed of a group of houses large enough to accommodate an extended Emirati family clustered around a courtyard or a park (Abu Dhabi Urban Planning Council 2010). This pattern reflects the very high importance of the family relationship, which is still vibrant (Abu Dhabi Urban Planning Council 2010). As a recognition for its current relevancy, the idea of the fareej has been adopted in the futuristic housing plans of the UAE. Al Ain 2030 Urban Structure Framework Plan, as an example of this trend, has acknowledged the fareej as the basic local housing pattern. In this Urban Plan, the plots are to be allocated so that extended families share the central courtyard, giving them the proximity to one another that they need. Privacy is ensured by the cul-de-sac entrance that keeps out through traffic (Fig. 10). Fareejis are grouped together into ‘Local Clusters’ arrayed around a small central park complex (Fig. 10). The catchment area is sufficient to support a kindergarten or a childcare facility, an outdoor play space and a local mosque. All of the streets surrounding a cluster are local streets with traffic calming. Local clusters are aggregated together into “Neighbourhoods” with a population of eight to ten thousand people. This is the catchment area for two single-sex primary schools, a Friday mosque, a park, and a women’s center. Local shops and higher density housing round out the needs of the neighborhood (Fig. 10) (Abu Dhabi Urban Planning Council 2009).

The key elements of a fareej are the courtyard house, sikka and baraha (Fig. 11). The courtyard house is built to the edge of the plot to maximize the use of land and to define the public realm. Despite the shift that happened between the courtyard public housing models of the seventies and eighties in the UAE and the currently applied extrovert compact houses (SZHP 2010 and MRHE 2010), there is a call in Abu Dhabi 2030 Plan (Abu Dhabi Urban Planning Council 2009) to return to the courtyard house pattern. The courtyard house is an ancient Arab form that works well in this region because it responds to the environmental challenges as well as the unique set of social requirements of the people. It is a covered outdoor space for the family to sit in the shade and enjoy the breezes that are created as a result of these simple passive design techniques that are both sustainable and responsive to the climate. Besides providing privacy, the design of the courtyard house is flexible...
both for internal rooms and for the courtyard design. For example, a guest majlis (hall) at the front of the house can have its own courtyard, while the family can have a second more private courtyard. Traditionally, there was a third ‘service’ courtyard that was associated with the kitchen and servants quarter (Abu Dhabi Urban Planning Council 2009).

The sikka is a narrow path, which is usually shaded by the buildings they run along. The sikka provides a cool, safe and walkable route to different destinations. Being pedestrian-friendly as they enable year-round walking, the sikka allows pedestrians, especially children, to move easily and safely from one courtyard to the next, they strategically connect the homes to neighbouring homes, community facilities and intimate public spaces known as barahaat (a plural noun of a baraha), as well as larger gathering spaces known as meyadeen (a plural noun of a meyadan or a square). Together these form the fareej. The baraha is a small and friendly space between homes that are located in a small number of key positions throughout the fareej (Fig. 11 a,c). There are usually a small number of shaded and cool barahaat to create focal points for residents to come and interact with one another, ensure maximum use and provide a focus for a larger number of people. Each baraha contains a safe, pleasant environment for residents and is designed to meet the needs of the people and facilities close-by and provides a pleasant environment for residents. For example, barahaat near schools may contain a small playground for children and families, whereas barahaat near mosques may contain a public majlis or a berza, which is found outside a mosque, for worshippers from the neighbourhood to meet and greet each other (Abu Dhabi Urban Planning Council 2009).

The spatial design pattern of the fareej makes walking throughout the neighbourhood much easier. Roads are created around the edge of the fareej and through the main sections of it to enable resident access and parking. It is recommended in the Abu Dhabi 2030 Plan (Abu Dhabi Urban Planning Council, 2009) that the vehicle roads and sikkak (a plural noun of a sikkah) can also be combined to create safe streets that enable vehicular access but are predominantly pedestrianized. Furthermore, the combination of the fareejs achieves a variety of community needs, including open spaces, community vitality, a choice of housing, good air quality and walkable, well-connected public transit. Now, the question is how to ‘vertically’ apply the traditional, and yet currently adopted, idea of the fareej with the help of notions derived from the above mentioned global initiatives? The following section is an attempt to address this question with the aim to realize the main objective of the research.
The main problem in many high-rise residential buildings in the UAE is the treatment of the residential tower as a stand-alone building. Inspired by the thoughts of the Herzog & de Meuron’s approach: “houses stacked in the sky”, the TR Hamzah & Yeang’s approach: “city-in-the-sky” and the Steven Holl Architects’ approach: “open city within a city”, the main proposed theme is, instead, built upon the idea of designing the high-rise development as a suburban portion of the urban context which of course is to be relevant to the UAE: the fareej. The following detailed concepts of the proposed theoretical framework do not mean to describe a final advocated model design for the high-rise residential buildings in the UAE, rather, they are conceptual guidelines hopefully leading to such a design. The advocated seven concepts are actually a blend of the lessons derived from the relevant-to-the-UAE mentioned above global design...
7.1 Design for a mixed-use development

Inspired by the Yeang’s, the Holl’s, and the Norr’s approaches in addition to a vertical configuration of the recently adopted fareej-based neighbourhoods in the UAE (Fig. 12).

Design for a mixed-use development

The high-rise residential development is to be a mixed-use one involving residential, office, retail, and recreational facilities. This sounds relevant to the UAE as it helps providing job opportunities in close proximity for the inhabitants and create more vibrant built environments. Nonetheless, the residential zone should have its own dedicated entrances and means of vertical and horizontal circulations. Solutions that call for too much integration between the residential use and other administrative and retail activities such as the recently adopted fareej-based initiatives in addition to a vertical configuration of the high-rise residential buildings in the UAE (Source: by the author).

Nonetheless, the residential zone should have its own dedicated entrances and means of vertical and horizontal circulations. Solutions that call for too much integration between the residential use and other administrative and retail activities such as the recently adopted fareej-based initiatives in addition to a vertical configuration of the high-rise residential buildings in the UAE (Source: by the author).
as in the case of the design by the Norr Group, would not be welcomed by the natives in the UAE as this might violate their privacy and security. So, each of the proposed mixed-use facility is to have its own allocated zone, whether it would be a separate tower (for offices) or ground floors (for retail activities). Still, residents can have direct access to these facilities. On the other hand, zones for the residents’ basic amenities can be more integrated with the vertical residential zones to allow for close proximity. Therefore, they can be distributed in the ground floors, such as in the Yeang’s approach, or in some intermediate floors, such as in the case of the Herzog’s (attached floors) and the Holl’s (sky bridges) approaches. Some of the proposed amenities in the previous examples will not be suitable for the UAE people due to different social and cultural values. This includes, for example, the swimming pools with adjoining outdoor sundecks, such as in the case of the Herzog’s project. Instead, the most appropriate amenities for the UAE natives, as recommended by the Abu Dhabi Vision 2030 (Abu Dhabi Urban Planning Council, 2010), include kindergartens or childcare facilities, outdoor play spaces, local mosques, a Friday mosque, parks, a women’s center and local shops. Some amenities can be provided for serving both of the inhabitants and the visitors such as the retail souk (shopping center) in the base floors as proposed by the Norr Group.

7.2 Design for social connectedness and integration

Bouw (2004) calls for a social and economic perspective for high-rise residential buildings which includes psychological and social function of the housing and the residential environment that encourage the development and maintenance of social networks and various types of social solidarity that change it from a “place to live” to “home”. Consequently, the design of the high-rise residential development itself should work in favor of increasing social interaction and communication among its residents. This should take place within the designed public spaces and facilities within the development. In his study about the residents’ social interaction in high-rise residential developments in Taipei, Taiwan, Huang (2006) found that both space types and design elements affect residents’ social interaction. Rauterberg et al (1995) also proved the validity of the hypothesis that a shared social space with continuous and “rich” communication possibilities leads to co-operative behavior.

Encouraging social interaction among residents, on the one hand, and other local communities in the surrounding urban settlements on the other hand, has been advocated in both the Herzog’s and the Yeang’s approaches but has been more evident in the Holl’s one. The fareej-in-the-sky proposal necessitates inherent integration with the surrounding residential urban agglomeration to work in harmony with the idea of strengthening social interaction and communication in the wider community.

For the interactions among the residents themselves, the fareej with its spatial configuration as a tool for social cohesion and integrity and as advocated in the Urban Structure Plan of Al Ain (Abu Dhabi Urban Planning Council 2009) can be vertically resembled in a similar manner to the method adopted in the Yeang’s approach. The houses of one fareej, which are accommodated by extended families and relatives can occupy one or more floors of the high-rise tower or connected towers. The fareej houses share the central open vertical courtyard in a way that gives them the proximity to one another. The houses are linked with each other and with the public amenities with sikkak on the same, or other, floors. A number of fareej are then vertically or horizontally grouped together into “Local Clusters”. Connectivity among fareej (floors) can be horizontal through sky bridges, as inspired by the Holl’s design, and/or vertical through internal pedestrian ramps, as employed by the Yeang’s approach. Residents in these local clusters can easily walk in the sikkak to a kindergarten at the same floor or close floors, to an outdoor play space and to a local mosque as their social connectivity nodes.

The local mosque is playing a quite vital role here as a social node in the proposed high-rise development because it is the place where usually most of the local residents of neighborhoods in the UAE meet to perform the five daily prayers. Wider social spaces of the baraha should work as a residents’ interaction hub in the front of these shared public amenities. Each baraha contains a safe,
pleasant environment for residents and is to be designed to meet the needs of the people and facilities close-by and to provide a pleasant environment for residents. For example, barahaat near houses may contain a small playground for children and families, whereas barahaat near mosques may contain a public majlis or a ‘berza,’ which are found outside mosques, for worshippers from the same residential tower to meet and greet each other. Wider groups of local clusters in different floors within the high-rise development should have horizontal and/or vertical access to local shops, a central souk (usually on the ground floor), a Friday mosque and a women’s center forming more social pods for residents’ communication and interaction. The high-rise development can be clustered around a central shared public space (maydan) assembling that employed by the Holl’s Linked Hybrid design.

7.3 Design for security
Besides the conventional security measures represented in the 24-hour doormen and concierges on the main entrances of the towers of the residential development, other design measures are important in realizing security. The smaller the number of the families sharing an entry and landing, the more the control they have over the public spaces. Therefore, they can more readily recognize residents from strangers and feel they have a say in determining accepted behavior (Newman 1996). In coincidence with this argument, the space hierarchy of the fareej from the private house courtyard, the semi-private shared courtyard of the fareej in the same floor, the semi-public sekkak connecting houses and services in the same floors and in other dedicated public amenities floors, the public barahaat spread over the tower especially in front of mosques and public nodes, helps increase the residents’ control over their spaces. Providing a space to talk and interact while the residents are approaching their units or getting out from them, the shared pathways surrounding the open courtyard of the fareej in each floor allow for visual surveillance over the space. In addition, residents will share the responsibility for maintaining these intimate spaces and will need to talk to each other in order to reach to agreements and thus have a sense of control, which inevitably will increase the sense of security among them.

7.4 Design for privacy
Privacy within the residential environment has proven to be an inherent essential social and cultural requirement in the Arab communities, including the UAE (Djebarni, 2000 and Opoku and Abdul-Muhmin 2010). Consequently, privacy should be considered on different levels within the high-rise development. Again, space hierarchy of the fareej with its spatial configuration from the private to the public domains is an essential spatial design tool for realizing privacy. As mentioned earlier, a careful design of the mixed-use development that takes into account the privacy of the residents is vital. Other design elements that can help provide privacy include, for examples, allocating a number of elevators for families only and others for male guests or singles.

7.5 Design for a high quality living environment
Yeang’s approach provides good insights into viable means for enhancing the quality of the living environment that can be applied, after adaptation, in the UAE. The building’s configuration with a weather-protected central landscaped core is an essential element that helps enhance this quality. In addition, the towers should be orientated to maximize solar gain into the interior spaces in winter, and to maximize solar shading in the summer months. Vegetation and landscaping within the private gardens and sky parks in the buildings will act as a wind buffer while giving residents a more humane environment. In summer, vertical landscaping will act to obstruct, absorb and reflect a high percentage of solar radiation thus reducing ambient temperatures. The damp surfaces of grass and soil will also contribute to a cooler and healthier building (Yeang 2007).

Furthermore, the idea of the central court adopted in the Holl’s approach where all towers are grouped around it sounds also suitable for the case of the UAE. The buildings in this case will case shadows over the pedestrian passages. The water pond will create appropriate conditions for shared social gathering and activities and will permit evaporative cooling. The idea of the veil of the Norr’s approach, which is meant to control weather conditions, and is covered with PV panels for generat-
ing electricity seems appropriate only in harsh weather conditions during the summer but should be developed, if utilized, to allow for natural ventilation when weather conditions permit. The sky courts and vertical public parks as well as the landscaped courtyard of the housing units will work as a climatic regulator as they allow for natural lighting and ventilation, when appropriate, from outside the towers. To help evaluating the means of improving the efficiency of the living environment a suitable assessment system should be applied in the design phase. Currently there are a wide spectrum of assessment methods including, for examples, CASBEE in Japan, BREEM in the UK and LEED in the USA. In UAE there is a local assessment method currently adopted in Abu Dhabi Emirate called ESTIDAMA which means sustainability in Arabic. Dubai on the other hand is adopting LEED in this regard.

7.6 Design for user-responsive housing units within the residential tower(s)

The design of the housing units within the high-rise towers should satisfy the specific socio-cultural needs of the UAE native communities. The designs of the public housing units in both the Sheikh Zayed Housing Program (SZHP 2010) and the Sheikh Mohamed Bin Rashid Housing Establishment (MRHE 2010) illustrate good examples for these needs. In both housing programs, the house is generally composed of main three distinctive zones, the family zone, the men guests zone and the service zone which is connected to the former two zones. For the sake of privacy, the men guests zone has its own facilities and is separated from the family zone. Moreover, the housing units within the high-rise residential buildings should be configured as courtyard houses instead of the extrovert front and back yards as in the Yeang’s approach, for example, or apartment houses with external terraces in the Hertogz’s approach. In Abu Dhabi Vision 2030 Report (Abu Dhabi Urban Planning Council 2009) the courtyard house has been advocated as the suitable configuration for the Emirati house. Besides providing privacy, the design of the courtyard house is flexible both for internal rooms and for the courtyard design. It can be a central courtyard house, L-shaped courtyard house, shared or multiple courtyard house. For example, a guest majlis (hall) at the front of the house can have its own courtyard, while the family can have a second more private courtyard. The ‘liwan’ (arcade) within the courtyard creates a transition between the indoor and outdoor spaces (Abu Dhabi Urban Planning Council 2009). The vertical composition of these courtyard houses remains a real challenge for the designers, especially when privacy is a priority for the residents. In this case, the courtyard should have at least one opened side on the outer façade or on the internal atrium of the tower if it will be closed partially or entirely from the top by other upper floors.

On the other hand, and in order to link the residents to their high-rise developments rather than to their housing units only, a variety of housing unit types with a variety of areas and functions meeting different needs should be provided. Thus, if a small family needed a larger space, a larger house in the same project might be available as another family might have less need for a large space if, for example, the children got married or leave the housing unit for other reasons. Furthermore, “open building” approach can help accommodate the ongoing societal changes within the high-rise development. Open building is the term used to indicate a number of ideas about the making of environment, including the idea that built environment is the product of an ongoing, never ending design process in which environment transforms part by part (CIB W1 04 2011). It is argued that the “open building’s” most important goal is to combine the freedom of choice and dignity of individuals in their dwellings and communities with the ecological coherence and stability of culturally appropriate buildings and neighborhoods. This is accomplished in part by organizing physical elements at any scale (building product to urban tissue) in such a way as to minimize their mutual interference. Thus, the interface between technical systems will allow the replacement of one system with another performing the same function - as with different fit-out systems applied in a specific base building. There is also the idea of distinct levels of intervention in the built environment, such as those represented by ‘support’ or ‘base building’, and ‘infill’ or ‘fit-out’ (CIB W1 04 2011). Kendall (2011) maintains that the base building normally includes the building’s primary structure; the building envelope
Community involvement in the design and the management of the high-rise development

Empowering the residents is essential in order to give them the responsibility for taking part in designing the living spaces and managing the shared social spaces/facilities. Smail (2000) advocates that society is like a huge central nervous system in which ‘social neurons’ (i.e., people) interact with each other via an infinity of interconnecting and overlapping subsystems. The fundamental dynamic of the system is power, that is the ability of a social group or an individual to influence others in accordance with its/his/her interests. Power could be conveyed to residents through their representation in the decision-making processes. Jacobs (2007) asserts that creating communities that are economically, socially, politically, and environmentally vibrant necessitates planners to design and build with the people and to take all of their various activities, values, and influences into consideration. Kendall (2011) maintains that those advocating an open building approach, as mentioned above, recognize that buildings are not static artifacts. Rather they need adjustment in some measure to remain attractive, safe and useful. Kendall adds that designing and constructing buildings involve many people, who, when reaching agreements, make distribution of responsibility a normal characteristic of the culture of building. Since no one party makes all decisions when a building is first constructed nor over the course of time as the building adjusts to new needs and technical requirements, we understand the importance of organizing decision making and construction in such a way as to reduce excessive dependencies or entanglements among the parties involved. This helps in the avoidance of conflict between people and the parts of the whole they each control, and improves the chances of balancing common interests and the more individual interests of those who inhabit space. The principle tool used by those working in an open building way is the organization of the process of designing and building on environmental levels including urban tissue level, support level, house allocation level, infill level and design level. The high-rise building in this case is a stable spatial and technical “offering”, making itself available to a variety of individual territorial claims, enabling each occupying power their own decisions within the constraints of the base architecture. In developing the proposed public high-rise residential complexes in the UAE, the process needs to be ‘inverted’ where beneficiaries should be identified first, then the development is to take place. By doing so, beneficiaries could identify what they like and dislike about their high-rise project such as the podium design, the gateways, corridors, activity nodes and their proposed housing units. Various participatory methods might be applied such as brainstorming sessions, public consultation meetings and focus groups. This will hopefully result in the creation of a community design handbook, which serves as the base for the second component of the plan. Traditionally, the local communities in the Arab region used to take control over the whole residential settlements (Celik and Akbar 1991 and Hakim 2008). So, for the UAE and with the call for adopting the traditional fareej as an urban pattern in the future public housing, the residents of a high-rise development should be allowed more control over the decisions shaping their shared living spaces. In this case, and to guarantee a continuous role for the residents in the management of such spaces, a place allocated as a community hall within the development should be designated for the relevant discussions.

8. CONCLUSION

High-rise residential buildings have been increasingly developed in many cities all over the world, especially in the UAE. Unfortunately, the issue of community-oriented design of this type of housing...
has received little concern on the part of the decision makers and designers. Some of the recent limited international design initiatives have proposed solutions for the community-relevant problems inherent in conventional high-rise residential buildings. Nonetheless, the problem remains in the inappropriateness of the direct implementation of these initiatives in the UAE without examining their compatibility with the specific local social and cultural contexts. The aim for this research is not to develop a specific design for community-oriented high-rise residential buildings in the UAE, but rather to highlight the concepts leading to realize this design. Consequently, the research proposes a seven-points theoretical framework composed of a blend of concepts built upon both the relevant lessons derived from these international initiatives and more importantly on the urban pattern of the traditional fareej as the smallest traditional urban housing element in the UAE that has been recently adopted in the official future planning visions in the country. These points include: the design for a mixed-use development, the design for social connectedness and integration, the design for security and privacy, the design for a high quality living environment, the design for user-responsive houses within the residential towers, and finally the residents’ involvement in the design and the management for the high-rise development.

It is envisaged that applying the above-mentioned theoretical framework is going to help realize, albeit not perfectly, community-relevant considerations in the high-rise housing not only in the UAE but also in other neighbouring countries. After transforming this theoretical framework into some design alternatives for high-rise residential developments in the UAE, further research is needed for examining the acceptability of these applied design concepts through exploring the attitudes of the UAE local communities towards them.

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Abstract

Poor living conditions in informal settlements may be attributed mostly, though not exclusively, to the lack of basic services. Informal settlements, which also go by the name of squatter camps, are volatile by nature. Even within relatively fixed settlement boundaries, change in urban fabric continually manifests through altering dwelling configurations. Deemed unstable and unsafe by formal criteria, these environments disclose schizophrenic characteristics: beyond the dirt, grime and smog, exist relatively functional societies capable of survival and self-regulation.

Public and private sector investment within informal settlements is restricted as a result of their illegal status. Inhabitants have no incentive to invest their own resources where they have no formal tenure over the land. Due to a rather backward approach to informality in South Africa, innovation in dealing with these settlements has been limited. Despite the fact that the rhetoric has sometimes changed from eradication to upgrading, little has been done with regards to alternative forms of settlement development that has relevance in terms of improving the lives of informal settlement dwellers.

With rising anger in poverty-stricken areas and on the peripheries of cities, what is needed is improved service delivery through immediate solutions. This article suggests a service delivery core, an architectural catalyst, rooted to the ‘energy’ of the public realm, stimulating growth of infrastructure networks. This catalyst core aims to instigate the amelioration of the surrounding environment.

The concept presented is that of a dynamic service core – universal in principle – while also being contextually-driven by responding to a specific environment and needs of a specific community. A generic architectural solution is thus presented to providing basic services and infrastructure within informal settlements, with focussed consideration for the unique situation of an informal settlement in Mamelodi, Tshwane (Pretoria), South Africa. It is important to realise that there is no final product, but rather an organic architecture that adapts in a process of continuous and progressive change.

Keywords: South Africa, informal settlements, progressive change, service delivery, architectural catalyst interventions.

INTRODUCTION OF CONCEPTS: ARCHITECTURE OF CHANGE

Hamdi (2004) explains how ‘small’ interventions grow and guide development and how the role of the professional becomes one of creating conditions for emergence and searching for catalysts. This approach generates a process of ‘negotiated reactions’ (Dewar & Uitenbogaardt, 1991), whereby continuous transformation is achieved within a stable environment. This approach acknowledges that the built environment is not static: it is a complex relationship between stability and transformation (Habraken, 1998)(Osman & Konik, 2008).

This study is therefore based on some fundamental design principles including the need to promote and extend architectural catalyst interventions in informal contexts. These structures provide various services (thus the term “servant core”) so that they successfully reach and serve the majority

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of people within an informal settlement. It is important initially for the catalyst intervention to address the basic needs of the inhabitants, and only at a later date, to stem off and provide several other platforms allowing for diverse interpretation and use.

It is understood that while projects need to have a bigger vision, in a context such as Mamelodi they need to start small, by identifying where existing energy is and latching on to that spatially, physically and functionally (Osman, Sebake, 2010). The resultant public space, which is thus shaped by the architectural intervention, is critical as a socio-economic stimulus inviting private informally-run micro-enterprises to operate within certain parameters. In this way, the intervention offers opportunity and provides place for social activity. It was therefore seen as key to couple the design intervention with an existing public arena, such as the sandy football field in the particular site of an informal area within Mamelodi. The servant core thus directly imparts some beneficial service onto the public realm, such as lighting and water points to mention a few. This strategic selection of site also establishes a symbiotic relationship, whereby the public are more likely to accept such an intervention and possibly take ownership of it.

The proposed construction method of these catalysts acts to showcase technologies, materials and methods relevant to context. The technology encourages communication with users through visual observation and tactile interaction. In addition to that, the structures are designed in such a way as to have the potential to be disassembled and relocated elsewhere and may possibly relocate once they have served their purpose on a particular site. However, depending on the changing needs of a specific environment, the structures could also be absorbed within an expanding urban fabric giving direction to the future development of the township and adopting new programmes.

The design of these catalysts is conceived to make provision for the informal sector, in terms of economical activities and environmental forms, as informality is considered a legitimate energy and form of expression. This is done, firstly, in the construction process and secondly in the way that the facilities will be used after completion.

A BUILDING SYSTEM SUITABLE FOR ENVIRONMENTS IN CONSTANT FLUX

Due to the fact that “slums change too fast to render any criterion valid for a reasonably long period of time” (UN-Habitat, 2003:11), the design solution presented here also has impermanent qualities. The built system is capable of learning and evolving in time; the capacity for change is integrated within it. It is necessary to design for future scenarios by “devising an ‘adaptive’ strategy that is exceptionally alert to changing events and can adjust quickly” (Brand, 1995:183). Designing for change within the built configuration should encompass both principles of adaptability: “capable of different social uses” (Groak, 1992:15) and flexibility: “capable of different physical changes” (Groak, 1992:15) in order to best respond to the ever-changing, ever-informing urban environment. This approach to the built environment is advocated by many practitioners, albeit under different names and banners: Time-Based Architecture (TBA), 4 Dimensional Design (4D design), Open Building etc. Time-Based Architecture has been defined as: “... a design attitude to conceive ‘objects’ from a long term vision, therefore integrating the fourth dimension, i.e. time, in the initial design phase.” (Paduart et al, 2009: 2). When this is achieved, time becomes a design catalyst where built environments are treated as living systems (Lukez, 2009:5).

INFORMALITY

“In developing countries, the term ‘slum’...simply refers to lower-quality or informal housing. Large, visible tracts of squatter or informal housing have become intimately connected with perceptions of poverty, lack of access to basic services and insecurity. Terms such as slum, shanty town, squatter settlement, informal housing and low income community are used somewhat interchangeably by agencies and authorities” (UN-Habitat, 2003:9).

There is a growing epidemic of informal settlements, albeit by different names, occurring throughout the world with no sign of a “cure”. South Africa has shown little innovation when it comes to dealing with informality. The intelligence
of the poor in identifying and occupying well-located land is dismissed as an illegal process rather than appreciating some of the benefits of the process, learning from it and supporting it through expert involvement. Adopting a “first-world approach” of eradication and “clean-up” is disadvantaging many communities who are unable to enter the, many times unaffordable, formal sector.

Most often these informal settlements are located on the outer periphery of cities and industrial areas – in this way, the informal dwellers are near enough to serve the city (they are therefore close to job opportunities) but they are not close enough to be served by the facilities available in the city. South African cities, despite political change since the end of Apartheid, stubbornly maintain patterns of segregation. The proliferation of informality is in many ways attributed to past spatial injustice, a process that generated some of the most inequitable cities in the world. Anger against the state has intensified in many forms. Numerous social and political problems such as violence, crime, service delivery protests and xenophobia might be a result of these spatial inequities. It is generally agreed that the problems facing these areas need to be urgently addressed if political stability is to be achieved.

Existence of an informal area is treated as temporary by authorities; however, the reality is that many informal areas continue to be in existence for long periods of time and are therefore quite well established. The inhabitants of informal settlements are generally resourceful and innovative in devising systems of habitation that are well-located (close to work opportunities), that are affordable, that can be constructed speedily and dismantled just as easily.

While upgrading and integrating informal areas into cities is the accepted approach, it is also acknowledged that mass-regularisation might also be problematic where it might prove to be impossible to formalise at a large scale given the extent of informality that exists in the country. Many scholars have called for an incremental approach where there is no strict distinction between formal and informal. Some have asked for investigating different forms of tenure security. There is a call to investigate the domain between strictly formal and informal, the “in-between” zone, in terms of physical structures, finance models and forms of ownership, that might include group ownership as opposed to a western system of individual ownership.

Some attempts have been made at an area-based approach to upgrading as opposed to focussing on the individual houses. In all cases, what is important is that addressing informality needs to be done in an innovative manner that is unique to context and that benefits the inhabitants. This is what this project set out to investigate, as well as to address the negative connotations of informal settlements.

There is a deeper intrinsic quality to an informal setting. “Emergence” of informal settlements within South Africa is both instant and gradual, determined by the intensity of energy at a particular time: need, economy, opportunities, politics, etc. A form of street grid is established, organic by nature and true to the energy which shaped it. The scale and layout is often more suited to a pedestrian scale as it is determined by the main “mode of transport” within the settlement, walking on foot.

The ubiquitous ‘tin’ shack, reminiscent of many informal settlements throughout the world is pragmatic, functional, affordable, but inadequate. While it functions well as a rain-screening shelter, the South African method predominantly uses a timber structure, usually with a recycled steel sheet clad exterior offering the user only the bare essentials of a shelter.

Informal settlements are in constant flux. Even when settlement boundaries have been defined by existing formal settlements, infrastructure or natural edges, such as steep slopes or rivers, within these boundaries, change in built fabric continually manifests through altering dwelling configurations. The disassembly and recycling of structures, together with new informal additions and extensions to older structures, creates an environment that is constantly being remodelled as dwelling units are adapted for increased practicality and density.

In order to remove demeaning overtones, it is essential for an architectural intervention not to be condescending, but rather uplifting and empowering, initiating a change in the outsiders’ perception of informal settlements and their inhabitants while stimulating the self-help strategies of the inhabitants. Architects have a special role to play in this process: “New imaginations are needed, both
robust and nuanced, on how these chasms [between the rich and the poor] can be bridged... It would be disrespectful of the dignity of those who had been shut out in the past to say that they should now be satisfied with having access to shoddy and styleless buildings based on the principle of bare necessities only. Elegance, accomplishment and suitability for purpose are factors appreciated by all, whether in dress, dance, music, speech-making, or sport or building... [there is therefore] no inherent incompatibility between a building being friendly to the public, on the one hand, and pleasingly, coherently and efficiently designed on the other.” (SAIA awards report, 2010)

Based on the above principles, the proposed design for a specific case study area in Mamelodi, South Africa strives to act as both a symbol of hope and progressive change.

THE INFORMAL SECTOR IN MAMELODI, TSHWANE

Mamelodi is a residential suburb approximately 25km² in area and was originally established in the 1940s as a township for black workers near the train station at Eerste Fabrieken. In time Mamelodi expanded to the East beyond the Pienaars Rivier, locally known as the Moretela River. Mamelodi is divided into two sectors by the Pienaars Rivier, Mamelodi West and Mamelodi East. Mamelodi West shares a distinct border with the established township of Eersterust to the West and the industrialised area of Silverton to the South-West. The Magaliesberg mountain range defines the northern perimeter of the greater Mamelodi. Mamelodi East is bound by the North-South lying branch of the Magaliesberg mountains and commercial and residential development to the South in the Willows. Mamelodi East contains a great deal of informal dwellings, particularly in the extreme East where there is significantly less formal housing and limited infrastructure.

Mamelodi still shows traces of its numerous growth patterns, both from its pre-apartheid and post-apartheid eras. It displays evidence of the diverse urban planning typologies practised during the changing years of government and the fusion of incongruent road grids as well as contrasting forms of housing typologies. Unconstrained growth of informal shacks is depicted by the smaller informal grid patterns.

In Tshwane, South Africa, as in other places, there exists a certain order within the apparent chaos of informal settlements. Internal policing, construction and trading are all resolved and carried out on a scale suited to context, available resources and paying power. Informal settlements establish cultural, social and individual roots which in turn support the greater structure of the settlement and the community.

The area of Mamelodi is rapidly expanding and swallowing up auxiliary informal settlements on the peripheries, and at the same rate giving rise to new informal “offspring” as informal residents located on the erratic edges would either move into the new formal housing or, together with newer immigrants, would again relocate to the shifting outskirts of the township. These informal settlements have been continuously uprooted and displaced by the expanding formal urban fabric of the township. The informal settlements in the extreme East and South-East of Mamelodi (informally known as Lusaka and Phumolong) were identified as areas in urgent need of basic services with high fire risks and poor sanitary conditions.

The informal sector of Mamelodi east consists predominantly of wards 10, 16 and 17. Collectively these wards comprise more than one third of the area of Mamelodi served by 1 clinic in ward 17. Sanitation is inadequate with poor health circumstances as result. Much of the material used to construct the shacks is obtained from the surrounding industries, mostly from the Ford manufacturing plant in Silverton. Many informal dwellings encroach upon the Magaliesberg on the eastern front. The threat of shack fires exists due to the high combustion rate of the building material and the high densities.

Much of the current formalised township of Mamelodi East is composed of consolidated informal settlements, in which land previously subdivided without approval is sold or leased to the informal residents and has overtime been recognised as part of the township. Improved infrastructural networks are thus provided and these informal settlements are merged within the recognised township. However, and in contrast, in some cases squatters
have been relocated and the land developed for new government-subsidised housing – also referred to as RDP houses (from the Reconstruction Development Programme) or “give-away” houses (alluding to the fact that owners do not have to pay or pay a minimal amount). Currently, the South African government aims to provide formalised housing and services to these informal communities. However priority is given to the informal settlements “of the most vulnerable and disadvantaged groups” (UN-Habitat, 2003:129) and those established during the apartheid regime and pre-1994 (Metroplan, 2006), thus excluding the specific site under investigation due to its recent establishment, after 2003.

THE SITE: PHUMOLONG

Phumolong is located in ward 16, extension 6, Mamelodi, Tshwane, South Africa at coordinates 25° 44'00" S 28° 25’00" E. It is almost completely surrounded by the township of Mamelodi (Figure 1) except to its south where the municipal boundaries of the City of Tshwane and Metsweding meet (both situated in the province of Gauteng).

‘Phumolong’, Sotho for ‘resting place’, is the local name for this land which is occupied entirely by informal settlers’ shacks with almost no municipal services provided. The area of Phumolong is located along the curved main road of Hans Strijdom (M10) defining both its Northern and Western boundary while two converging railway tracks demarcate its Eastern and Southern limits (Figure 1). This area is locally referred to as ‘bridge to bridge’, referring to the proximate infrastructure, and is managed by a community elected ward leader and committee. The older neighbouring community to the North-West, known as Marabastad by the locals, also belongs to Mamelodi Extension 6 and boasts RDP housing together with the necessary infrastructure. Electricity is extended from neighbours by means of illegal ‘izinyoga’ (Sotho for ‘snake’) connections. Hose pipes are connected to garden taps within the neighbouring Marabastad and transverse the dividing asphalt roads. Hose pipes meander down the gravel roads serving the community of Phumolong, sometimes unseen but mostly overlooked by the municipality.

Mamelodi does not have a fire station despite high rates of fire. Apparently, Mamelodi has...
the highest rate of fire among any other wards in Tshwane for the year’s 2007 and 2008 (City of Tshwane Disaster Management Services 2008). A fire station is a necessity (Chief Fire Warden of the Pretoria Central Fire Station, J Pieterse 2009, 25th May). A central location would offer greatest access to fires within Mamelodi and the neighbouring areas of Nellmapius, Eersterust, Watloo and the area of the Willows.

Inadequate vehicular access and the absence of fire hydrants within Mamelodi and its informal sectors delay the process of extinguishing fires. This gives fires time to spread, many times having deadly consequences. The provision of a water reservoir, sorely needed by the informal residents for human consumption, could also co-function as a ‘fire filling station’, operating as fire hydrant in times of fire. This idea gave rise to the concept of a servant core with its primary activities based around the provision of water (Figure 2).

The location is suggested along the edge of a well-used football pitch (Figure 3). This allows for easy access to water in times of fire and also guarantees a constant presence of people and aims to create a sense of pride and ownership in the structure.

THE PROJECT BRIEF

This design intervention aims to improve service delivery as well as social well-being within the informal settlement of Phumolong. The scheme acts as catalyst for social growth as well as system and services growth thus responding to both individual and community needs.

The intervention is to be the generator for service delivery and an ordering structure within the urban fabric by acting as basis for urban societal life – thus linking improved infrastructure and services, a sense of community pride and participation is to be achieved by giving emphasis to the importance of positive public space. Through this process, lack of public amenities and services is addressed. Also, in the process, architecture is investigated as a responsive system. As a changing relationship of form and programme, the architecture investigates the potential to achieve a higher degree of independency through the integrating of energy inclusive systems and infrastructure that do not rely on the municipal grids or systems. In other words infrastructure as architecture is explored resulting in an adaptable and flexible architectural plug-in system.
The design intervention also serves as a symbol of renewed hope and support. It establishes an improved identity within the settlements and informal sector. The service core provides place and opportunity for the local business owners and surrounding residents and is capable of expanding according to future needs, allowing new and changing programmes to be attached to the system. The intervention is a public services building integrating public space with public services and amenities. The users are the informal occupants, business owners and the community as a whole. The phased growth of the design intervention (Figures 4 and 8) incorporates various clients at different stages. The first client[s] will be responsible for construction of the primary structure and necessary infrastructure and would be the government and its relevant departments such as; the Department of Human Settlements, Department of Energy and the Department of Rural Development and Land Reform.

The secondary clients are responsible for construction of buildings having civic importance and serving as public amenities. Such programmes and clients may change depending on need of the community but may typically be healthcare, educational facilities or even a post office or place of worship. The lifespan of such programmes depends on the needs and position of the community at a given time. Other clients such as small, medium and micro-enterprises will be responsible for their own building construction and attachment to the servant spine. They too influence the growth of the servant spine. Advertisements and branding attached to the building structure may generate further capital needed for maintenance and systems growth. A local entity would have to be elected to manage these processes.

Possible funding and material can also be obtained from sponsors such as steel manufacturer Arcelor Mittal. This company has partnered with the South African Department of Education to build ten schools throughout the country using new steel technology, one of which is in Mamelodi.

**THE SUGGESTED CONSTRUCTION METHOD**

It is important to note that the proposed structural configuration is not a “one size fits all” but rather an assembly of easily attained, transported, manipulated and fastened parts. With this in mind construction materials and methodologies were considered which allowed for an ease of disassembly and compatibility. “Design for Disassembly” (DfD) is the detailing of connections between a building’s different components; DfD means designing buildings that can be disassembled and reassembled part per part (Durmisevic, 2006), it assures that connections can be undone. “Design for Compatibility” (DfC), on the other hand, ensures
that elements can be connected to each other, because their measurements are all based on the same sequence.” (Osman & Herthogs, 2010).

The Hendrickx-Vanwalleghem Design Approach (HVDA) integrates both DfD and “Design for Compatibility” (DfC) into a design strategy based on process analysis and control (Debacker et al., 2006). It presents a set of guidelines to design multiple adaptable and reusable constructional components which are compatible with each other. Thus, these components can be used to design a variety of adaptable and reusable constructional sub-assemblies. The result is a “generating system” where a limited number of basic elements and a set of combination rules allow more complex entities to be “generated”. This method therefore focuses on the life cycle of the building components (Osman & Herthogs, 2010).

Therefore, the proposed structure allows for future adaptations by attaching and fixing standard components to the primary structure. Thus the design is not limited to a specific kit of parts but is rather a structural configuration undergoing constant evolution according to best practice at a particular moment in time. Thus, these components can be used to design a variety of adaptable and reusable constructional sub-assemblies.

The common construction method in the townships is that of the block/brickwork house and the steel clad shacks. The former, mostly constructed through government subsidies, uses wet works construction and typically contributes to the establishment of more permanent settlements. In the more established wards of Mamelodi, this structure is very often manipulated by the land owners with additions, extensions and alterations. Its counterpart, the ‘Zozo Hut’, is constructed in like fashion and has established itself amongst the informal business enterprises. It is also commonly erected on formal stands and is used as a rentable outbuilding. The Zozo Hut is often seen as a temporary solution to housing due to its ability to be relocated with the user. The existing construction culture gives rise to an opportunity to examine an architecture based on disassembly and re-assembly.

For this project, these two systems are taken into consideration with regards to achieving a degree of permanence with the option of changeability. Thus the criteria for material and construction demands ease of transport, on-site assembly using local labour, self-informing assembly by unskilled labour, labour-intensive operation, piece assembly and erection, skills transfer, low skills operation, economic viability, little or no heavy machinery to be used, limited need for electricity (thus requiring the majority of work to be done by manual labour with no welding). This has led to the consideration of a steel structure with predrilled holes at determined increments to be fixed with nuts and bolts (Figures 5 and 6), assembled on site with the ability to reuse the components upon disassembly, relocation or manipulation of the structure.

Lightweight cold-formed steel sections are ideal as a building material. The advantages are that this form of structure is lightweight, has a high strength-to-weight ratio, high stiffness and comes in various shapes and sections which can allow for additions and alterations with minimal wastage. The material is non-combustible and allows for prefabrication of parts, compact packaging and accu-
rate assembly.

Hydraform dry-stacking blocks have the following dimensions 120-240mm long x 220 or 140mm wide x 115mm high with typical strength values of 4-7MPa. This method is considered as infill in this project as these blocks are ideal for remote regions as they are produced on-site by means of a mobile or stationary block-making machine. The interlocking dry-stacking blocks require minimal mortar and are produced from Laterite (building sand/sub soil) and 5-10% cement. Hydraform uses soil cement Compressed Earth Block (CEB) technology. Blocks do not need to be burnt and need a minimum of 7 days curing. Hydraform equipment is made locally and the franchise provides full training and support. Mobile block making machines need low-skilled operation with little or no dependence on higher skills. Thus it is labour intensive with almost all of the production and construction process occurring on-site. It is thus cost-effective and fast to use.

Finnbuilder box shuttering dimensions are 480 mm (length) x 220, 150 or 110 mm (wall thickness) x 240 mm high and allow for straight as well as circular walls. Finnbuilder is a slip form shuttering system whereby a shuttering mechanism is
filled with the necessary cement, sand and aggregate mix and upon compaction is slid to the next area along the length or height of the wall/column. The main advantages are that it is produced on site, is labour-intensive, on-site soil may be used, low skills necessary, with the option of skills transfer. This is a low cost-high strength option.

Brownbuilt is used as roofing or cladding material. The interlocking steel profile together with its clip-fixing requires no fixing holes for screws or nails, thus eliminating the damage incurred to the sheeting by such holes and allowing it to be reused. Produced in widths of 406mm, the lengths are specified by the client and are only limited by transport constraints (usually 18.6 m). Brownbuilt can be used in conjunction with other sheeting profiles by using the relevant flashings, and it is easy to install.

Abeco hot-dipped galvanised lightweight pressed steel tanks are composed of prefabricated modular panels. These are used to erect the tanks for water storage as they are ideal for remote areas where access is limited. Their small modular size and robustness allows for easy access and demanding transport. Panel sizes are 1220 mm x 1220 mm or 610 mm x 1220 mm half panels produced in 3 mm, 4.5 mm and 6 mm thicknesses. The maximum depth is restricted to 4 panels (4880 mm). It is planned that panels be painted by local children and artists helping establish a sense of ownership through community pride so as to deter vandalism as well as aiding in corrosion resistance.

Only 3 types of fasteners, all 8 mm in diameter, are to be used on the steel structure reducing the need for a variety of fasteners and chances of error. These are specified as hot-dipped galvanised, high tensile grade nuts and bolts, easily accessible though fitted with a guard-nut tamper-proof fastening system to prevent vandalism and theft and galvanised gutter bolts.

By these materials, products and technologies, or similar alternatives, as the basis for the building parts, an adaptive system emerges. This system is thus capable of reacting, growing, shrinking and learning. The steel structure undergoes a structural and programmatic evolution (Figure 7), reacting to need and growth intensity. This prevents an initial high capital cost as well as allowing the layout to be tested by the users, who then respond appropriately.

CONCLUSION

For this proposed system to be successful, the community of Phumolong needs to be fully involved from the outset. The strategic site is crucial in establishing a service core as a catalyst, which will trig-
ger off more activity and construction, either attached to the service core or in close proximity to it. By a unique approach to the project and the design conceptualised, it is hoped that there will be a willingness from the public and private sectors to invest in the area. However, as discussed above, the initial project need not be a large, capital-intensive intervention, but rather a seed that inspires and guides an ongoing process. Ultimately, the aim of the servant core is to serve the community by providing the necessary basic services while acting as catalyst for social upliftment. In conclusion, the architectural approach encourages the design intervention to serve as mediator through a process of change. There is no final product, but rather architecture adapting constantly in response to the demand and energies of the surrounding context and its inhabitants.

ACKNOWLEDGMENTS
Mr. Jacques Laubscher is acknowledged as the supervisor for this study and the coordinator for the M Arch Prof degree at the Department of Architecture, University of Pretoria, 2009. The study was partially funded by the University of Pretoria and the National Research Foundation (NRF), South Africa.
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ALIENATION OF TRADITIONAL HABITATS AND SHELTERS IN JORDANIAN VILLAGES

Ahmed Abu Al Haija

Abstract

Hundreds of Jordanian traditional villages are facing the serious risk of being demolished due to the shortage of basic public services and their resulting abandoned state. Important occurrences of vernacular architecture in these villages necessitate a national strategy to conserve the tangible and intangible heritage they offer, despite the economic difficulties that impede the local community in their efforts to protect or rehabilitate their long-established habitat and traditions. The case of Dana is a relevant example of these villages that are abandoned in spite of their considerable human and material potentialities. Therefore, analyses of place-oriented conceptual meaning, which affect man’s belonging to the place, and building typologies are developed in order to comprehend the traditional spatial composition and the interrogatives of conserving the original habitat for tourism purposes. Appropriate scenarios of administrative and technical approaches could better offer the local communities the conservation of memories, place identity and sustainable economic development, hopefully extendible to other situations in traditional villages.

Keywords: Social Spaces, Culture, Place Character, Dana Village, Traditional Shelters.

INTRODUCTION

Before the establishment of Jordan as an independent state in 1946, the Jordanian population was mainly composed of semi-nomads who settled in villages close to the fertile lands of the country, and nomadic Bedouins who had previously wandered in the desert of Arabia (see: Bin Mohammad, 1999; Shryock, 1997). The traditional Jordanian villages represented places of stability for the seminomadic population, where emotional attachment and a physical context became the signs of local national Jordanian identity.

The village of Dana was a typical result of habitat production and “man-made expression” (see Smith, 2003), where the community in certain circumstances collectively creates its own common culture, symbolic values and characteristic living environment, producing specific forms, typology and a compact urban fabric suitable to their habits and lifestyles. This production of the habitat proper begins with the initiative of a familial bond, evolving without any pre-programmed projects to authentically reflect the collective and individual needs. People had the capacity to create their own shelter depending on social collaboration, rather than through the intervention of the State or by following particular norms and obligations encouraged by any local administrations. The spontaneous urban texture and architecture in the village of Dana reveals the necessities of having minimum spaces to live, reducing the size of units, openings, and structural forms, and inventing typologies that reflect particularities of the vernacular architecture in Jordan.

Some Islamic social and territorial principles have created in several countries a strong sense of attachment to the place in terms of personal interrelationships (see Akbar, 1992; Al Abed, 2010). In fact, these principles have encouraged, firstly, the nomads to be stable in lands that they become owners of—if they cultivate or use it according to the principle of “Ihya Al Ard,” which means land revitalization. Secondly, other principles have supported the construction of buildings to be attached to each other following some of the Hadith of the Prophet Mohamed in citing several regulations and norms of their relationships. These
hadith recommend, for example, the use of a common wall in between neighbours in order to favour a more compact neighbourhood (see also Fusaro, 1984). The urban structure of Dana village reflects the traditional culture of Muslims through the construction of their habitat in terms of public, semi-public and private spaces.

The semi-nomadic population of Dana has lived many hundreds of years cultivating the fertile lands of the area, grazing sheep and producing milk and cheese. In 1973, about one thousand persons gradually moved to a new quarter located about 3 km away from the village (Naa’na, 2001). The government sustained the local population by building low-cost housing units and supplying some public facilities such as schools, clinics and a civic centre. The lack of these services and public transportation in the original village of Dana favoured the displacement and, consequently, the abandonment of the village, which thereby provoked gradual physical deterioration of the buildings and place alienation among the indigenous populace. For this reason, the local community of Dana is still sceptical regarding some public and private proposals to rehabilitate the village for tourist purposes, not only for economic reasons but also for social and administrative factors.

The objectives of this research pertain to the conservation of habitat in architectural and human terms, preventing reasons of abandonment of these villages in order to protect the history of the cultural material of the Jordanian people in an authentic manner. Tilley (2006: 15) cites MacCanell who has argued that “at the heart of tourism is a process in which local culture and identities become consumed by outsiders, cultures and identities which lack authenticity because of the displacement and movement of peoples”. Therefore, a sustainable approach in rehabilitating some Jordanian villages for tourist purposes in addition to local habitation is recommended as welcome source of economic development (Robinson and Boniface, 1999). However, there is a need to avoid any marketing ploys in restoring the village (Lansing and De Vries, 2007) and considering that a tourist’s meaning of place generally contrasts strongly with the resident’s meaning of place, which could create conflict (see Abul Al Haija, 2011; Relph, 2000).

The village of Dana is also selected as a significant case due to its traditional and architectural values in relation to its geographical importance and environmental context. A Nature Reserve was instituted at the borders of the village in 1993, covering 320 square kilometres within a range of 20 kilometres, to protect the unique Mediterranean flora and fauna of the area (UNESCO, 2004: 59). This paper highlights some of the communal particularities of this village, discussing the human needs in relation to abandoning the place where people have their roots, and the loss of community spaces and unique architectural character of shelters.

Methodologically, due to the shortage of documentation or research regarding Dana Village, the author spent different months there and in other Jordanian villages collecting, through the oral testimonies of local inhabitants, information mainly of qualitative type regarding the population, activities and opinions of the indigenous population. In addition, several contacts with local representatives and public institutions were also arranged, which were fundamental in providing feedback for this paper. Numerous contacts were established particularly with the Mayor of Al-Qadisiyya (who was born in Dana Village and directly assisted the author in the field survey and the memory of some particular places), the representatives of Dana and Al-Qadisiyya Local Community Cooperative and components of the families who still live in Dana village. Therefore, this paper is structured in order to encourage a multi-
disciplinary approach, proposing socio-cultural and technical analysis for similar cases in Jordan and possibly for other countries, highlighting the importance of adopting a comprehensive strategy in dealing with the protection and conservation of villages scattered in vast territories, all under submission to infrastructural problems and public service needs.

DANA VILLAGE ANALYSES:

Geography, History and Population
The site is located about 50 kilometres north of Petra and 2 kilometres west of the historical “King’s Highway” (Figure 1), which connects the old population centres of Kerak, Tafila, Shobak and Petra. The geographic location of Dana has been important since the Neolithic period (4500-8000 BC). Over the centuries, Egyptians, Nabateans, Romans, Byzantines and Muslims have settled in this area (Khresat et al, 2000).

Dana is found on the side of the first deep valley of Wadi Feynan, where, similar to other traditional Jordanian villages in the southern part of the country, the rough topography, steep slope and only one possible entrance to the village favoured it as a natural security refuge against the Bedouins’ attacks on it (figure 2).

In fact, this location could have been influential in the creation of early dwellings in the village, which were camouflaged by a complex of buildings and roofs formed by one storey, which followed the terrain contours down toward the valley (figure 3). A semi-nomadic tribe (Al-Ataat) settled in Dana, probably around the second half of the Ottoman period, encouraged by the water springs and the fertility of the soil for agricultural activity, while simultaneously conserving the traditional pastoral life that moved across the Jordanian desert in the east and Wadi Araba in the west (Abu Mohammed Al Abed, residents in Dana village, personal communication 2010).

The habits and culture of the population...
are characteristic of Jordanian simple rural life, where a strong sense of cooperation is dominant, especially during the grain harvest, its collection and storage.

Character of Place and Architecture
The public and semi-public spaces were arranged to reflect the social relationships mentioned before, and there were few open areas utilized for ceremonial social events. The urban fabric was articulated through building typologies that organically reflected the topography of the land, which was selected originally for security reasons, climate and availability of local materials. The open spaces represented the smallest portion of allotted space inside the village, which may have been due to security requirements by creating a thick density of surrounding buildings without a clear hierarchical pattern. Narrow and winding pedestrian paths lead to shelters and patios; different alleys branch off from the central street to the interior semi-private spaces forming, in some cases, cul-de-sacs that open to the doorways of shelters. These paths are determining forces in forming comprehensibility of the residential site’s character.

The typologies of the houses, their sizes, openings, furniture, volumes, and spaces—authentically reflect the old use of these shelters, where the plan is generally composed of a flexible open space to allow multi-purpose uses: the size of the shelter varied from less than 10 to around 70 square metres with very few openings, most of which measure around 40 square centimetres. These openings are generally located in small rectangular shapes above the arched doorway or in other cases, a small hole in the ceiling, which serves as a chimney. The characteristics of darkness and small dimensions of the shelters are partly the result of the conservative culture of the inhabitants, where the women are protected and not to be seen in public. They are also partly the result of the relatively short daily residence of men inside these shelters, as they spend most of their time grazing their flocks far away from the village. Furniture is built from mud and hay in organic forms, including the wheat bins attached to the bearing walls, and small containers of grain, which are called khabieh.

Poverty forced necessary solutions to effect privacy, considering that in several cases more than two families divided the same shelter of less than 50 square meters. In these cases, the dwelling was divided into single zones called mastaba, which were separated from the others by a carpet hanging called albijad. Small halls were located in between the walls that divide these zones, in order for the neighbouring women to keep in contact with one another. These poor shelters, which also lacked interior bathroom facilities, also contained spaces for some domestic animals located in special spaces called mithwads (figure 4). Communal latrines, which all residents of the village used, were set apart from the multi-purpose rooms. Some bread ovens (taboun) built of mud were also used by all residents of the village. (Mayor of Al-Qadisiyya, personal communication 2010) (see also McCann, 1997: 117).

Some shelters form a miniature neighbourhood organized around small courtyards. The typical typology is formed by rectangular spaces with arches called gantara (to a maximum of 3 arches) which support the ceilings that used to be covered by mud and a waterproof layer composed of a fine-grained, special mud known as samag. Many of the traditional houses in Jordan are rather typical. Some differ in the way their ceilings are constructed. Khammash (1995: 75) uses the ceiling to cat-
Categorize the different kinds of structures, analysing the rural fallahi houses in some vernacular villages in Jordan. The typical way of constructing the ceiling in a fallahi house is by the placement of one to four arches paralleling each other and the front wall. “This divides a large rectangle into smaller spans in order to use the typically short trees of Jordan and to avoid the risk of using beams that might bend under the load of the heavy layers of mud in the roof” (figure 5). Shelters are constructed in a compact form attached to each other and separated by few narrow alleys. Doors are well-crafted from the trunks of trees and locked by steel bolts and locks (meghlak alghal).

Due to the state of abandonment, about 370 houses analysed during the survey were harshly deteriorated. For example, roofs and bearing walls had collapsed (more than 70%). Some courtyards had recently been used for animals (goats and sheep) causing different kinds of decay due to the effect of animal waste on lime mortar and stone. Some collapsed shelters had been substituted out by the owners in the last 50 years for more modern forms, which used concrete slab and beam. Figure 6 shows a model of Jordanian traditional architecture transformation, substituted bearing walls, mud roofs and arches into a concrete structure, flat arches and wide span.

The new typical typologies are generally composed of a rectangular shape forming two rooms and a bathroom located in an open space in front of the shelter. The external walls consist of 15-20 cm thick hollow cement blocks without any insulating material. The flat concrete roof is also not insulated and the roof color is gray concrete that has a high rate of heat and cold transmittance (see: Energy Efficient Building Code for Jordan, 2009). All these new shelters (about 10) had also been abandoned.

THE ABANDONMENT OF DANA VILLAGE: AL QADISIYYA NEW QUARTER

Despite the abandonment of the village for more than three decades, the memory of place is still alive within the elderly people of Dana who bear in mind all these events and social relationships. A pleasant place creates a strong sense of belonging and reasons deeply rooted in the proper space and community (see Kaplan, 1987). The new quarter established close to the Kings Highway around...
three kilometres away from the original site of the village of Dana has encouraged people to leave the original village and now also accommodate other people from the area. The number of residents in this new quarter, called Al-Qadisiya, was 2,392 in 1979. In 2009, the number of residents increased to 7,712 (figure 7). Consequently, the village of Dana was severely reduced to 410 persons in 1979 and in 2009 there were 91 residents in Dana (Statistical Department of Jordan, 2010).

In 1982, the Municipality of Al-Qadisiya was established on 8 square kilometres in order to better manage urban development and social services. As of a recent survey, there were four elementary schools, two high schools, one civic centre, one clinic with only three doctors in charge and a dental clinic. The local government offers free modest health services for low-income families, but the public services in terms of quantity or quality are drastically below an acceptable standard (see Steiner and Butler, 2007). In fact, in the approved Structural Urban Plan of Al-Qadisiya (2009), the area allotted per resident is less than 2 m square/person, without also taking into consideration the lack of green and sport areas for children and adults. Problems of poverty and shortage of funds or capital for investments are the main causes of this severely depressed urban condition (Mayor of Al-Qadisiya, personal communication on April 2010).

Naa’na is a researcher born in Al-Qadisiya and interested in the environmental problems of the area. He states: “The development of social services in Al-Qadisiya has concentrated the population in this new quarter, leaving Dana historical village, but I’m very worried about this development in which people have abandoned some of their traditional habits and cultivation searching to be governmental employees. The increasing number of population and the urban growth created diminution of agricultural lands abandoning the traditional activities, which negatively affect the environment” (Naa’na, 2001: 59). The Mayor of Al-Qadisiya highlighted the alteration of social attitudes regarding the community’s sense of solidarity in the case of death or marriage. For example, these social events had become more restricted to the family in comparison to the past situation in Dana village, where these events had been practiced with the involvement of the entire community.

The architectural and urban typologies of the new Al-Qadisiya quarter are completely different from those of the village of Dana. Buildings are detached from each other, using similar forms involving steel and cement materials. The setbacks of buildings, volumes, and heights are totally regulated by the municipality; the process of development of the neighbourhoods depends mainly on the local authority’s decision, reducing to a minimum level the possibilities of local community involvement. Citizens don’t live in community anymore but are isolated in individual monotonous buildings (see figure 8). They don’t interact as before, lacking their traditional open spaces such as squares, paths, and patios, all of which were previously organised for social events and meetings. The new houses provide more interior living space in comparison with the traditional shelters, a greater number of rooms per nuclear family, and indoor kitchen and bathrooms. Some are multi-story urban houses which open out in most cases
directly onto the street.

Public life is for the most part reduced to attendance at the Islamic prayers on Fridays. The shortage of public communal places and particular character of architectural elements and urban spaces affect the inhabitants of Al-Qadisiyya by making them emotionally less attached to their place of origin (see figure 9: The comparison between two roads in Dana and Al Qadisiyya. Note the character of place marked by materials, unity and harmony of buildings).

Some elderly people (in personal communication to the author) described life in Dana village and Al-Qadisiyya by expressing their strong sense of disappointment in regards to the degraded urban quality of the new quarter and the lifestyles of their children, where persons are isolated in detached houses and exposed to traffic, sun and wind conditions, as well as the lack of any commune and social spaces. In comparison with Dana village, the sense of relationship and socialization was favoured by its urban texture, and articulated with human passions for public and environmental needs. Figure 10 shows a comparison between the organic pattern of Dana and the modern geometric pattern of Al-Qadisiyya.

THE URBAN AND ADMINISTRATIVE RECENT SITUATION

According to an unpublished document, an international organization offered a grant to help in rehabilitating the village for tourism purposes. The Jordanian government was interested in seizing this opportunity through the Royal Society for the Conservation of Nature (RSCN), which is the NGO authorized to manage and use state-owned land on behalf of the Kingdom (Arch. Khammash, consultant on the proposal, personal communication, 2010).

Although the project plan and the funding were not yet published, the RSCN called the owners and representatives of the village to sign an agreement in order to rehabilitate the village for tourism purposes. The owners were requested to contribute to the construction of the intervention in terms of costs covering part of the project, which could be paid in instalments (A. Al Khawaldeh, President of Dana and Al Qadisiyya Local...

Figure 8. Schematic plan of dwelling and a residential prototype in Al-Qadisiyya. Source: Author

Figure 9. Local street in Dana (on the left) and local street in Al Qadisiyya (on the right). Source: Author 2010
Community Cooperative, personal communication (2010). Khaled Al Khawaldeh, who is active in some social programs within the community of Dana, was sceptical concerning this initiative, as he remembered his previous experience with the RSCN in managing the nearby Dana Nature Reserve, particularly concerning the limited benefits to the local community in terms of employment as well as the restrictions imposed on grazing.

Al-Khawaldeh, K. (2006) states: “In 1989, the very first steps for the foundation of the Dana Protectorate were taken by [the RSCN], against the local inhabitants' apprehensions. All members and employees of the association were from the capital Amman, which is about 200 kilometres north of the village. In 1993, the establishment of the protectorate was officially declared. This, in turn, led to the centralized control of the region surrounding the village and, thus, curtailed the social and economic activities of the people, who relied mainly on livestock breeding, agriculture and firewood gathering to meet their primary needs. The people were marginalized by their low education levels as well as their lack of practical expertise, legal culture and knowledge of relevant litigation. The local inhabitants lacked any influence over decision makers, particularly in light of the authoritative nature of the RSCN, [which was] directed by Jordan's most prominent figures, with its experience, financial and media power”. However, architect Khammash also states that the local community will receive important technical aid, plus increased financial and administrative opportunities to rehabilitate the village and make sure it really works, thanks to the tourism activity programs.

A sustainable development of the village by rehabilitating and restoring it for tourism purposes could be a measured intervention, taking into consideration the relevant historical and natural landscape of the village and its constraints, which make it difficult for the original inhabitants to upgrade the village to a completely new status. Moreover, this evident conclusion applies, in certain circumstances, not only to abandoned villages such as Dana Village, but also to many others in Jordan. Thus, in similar circumstances, the conservation of original habitat, memory and spirit of place are substantially theoretical objectives. Meanwhile, the original inhabitants have long lost their links and social relationships within the place. Furthermore, the restoration of shelters would be so far-reaching so as to transform every original architectural element, even if these changes attempt to clone the original forms and materials, such as in the rehabilitation project of Umm Qais (see Ministry of Tourism and Antiquities, 2006, Project of Rehabilitation and Re-use of Umm Qais Village).

These presuppositions and certainly many others will logically guide any project of rehabilitation and restoration of the village, transforming the traditional site into an open museum, a “Disneyland of the Past” altering both the original habitat and character of the architecture (see Pocock & Hudson, 1978; Jackson, 1994; Dezzi...
CONCLUSIONS

The quality of houses, people culture, relationships and built environment—all of these elements define the character of a place and the affection of people and their appreciation of it. The village of Dana’s experience in displacing the local inhabitants to another location is revealed to be critical considering the effects on the local community and the people’s comfort with the shelter proper. However, the conservation of the spirit of place concerns the historical memory of people who lived in this abandoned village: their daily life, movements inside the village grounds, holidays, marriages, death, special events, and so on. These can be documented and illustrated “live,” exposing spaces and habits only in the museum context. Documenting these traditions should be generally taken into consideration in keeping not only the physical aspects of the past, but also the memory of this place. But are “museum-ified villages” the only model that can be used in the rehabilitation of the major part of the Jordanian traditional villages? Has the culture of people become substantially nothing more than commercial goods to show to a curious public, while the original poor inhabitants are obliged to transfer from one place to another searching for public services, work and shelter?

The traditional villages in Jordan are valuable future resources for the economy of the local populations. Adopting physical and economic master plans at regional and local levels is an essential tool in enhancing people’s stability, since adopting adequate infrastructural and public services is the first indispensable phase toward a holistic approach of conservation and rehabilitation, followed by a national strategy, which has the objective to preserve the memory of place and restore important heritage sites. The elaboration of technical guidelines is fundamental for the rehabilitation and restoration process, in order to establish a homogenous background of norms and modality of interventions. These address all components of the villages, conserving, as a principal concept, the palimpsest of every historical stratification, meanings and signs, and adding the requested innovative technologies, new spaces and buildings in order to keep its modern functions alive. This approach is also necessary to gain the symbolic economic advantages that the historical Jordanian centres offer.

Sustainable development of Dana village by rehabilitating and restoring it for tourism purposes is actually requested by both the local community of Dana and the central government. A realistic scenario to restore and rehabilitate the village should be coherent with the exigencies of Dana’s local community: to be partners in the rehabilitation project, not just consumers; to have more transparency in the agreement, specifically regarding the costs of project and implementation and to be involved in the decision process of the intervention.

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A READING IN CRITICAL REGIONALISM: ANALYSIS OF TWO HOUSES BY HAN TÜMERTEKİN*

Abstract

If regionalism is defined as designing responsibly in reaction to a local context, then critical regionalism can be defined as doing so without denying the universally enlightening content of the modernist project. Armed with this definition, this article attempts to analyze two houses by architect Han Tümertekin that are set in a rural context in a very small Aegean village in Turkey. The aim of the paper is to explore the extent to which these two buildings embrace the tenets of critical regionalism and to understand the local relevance as well as international esteem of the buildings.

Keywords: Critical regionalism, tactile, place-context, tectonic-poetic, defamiliarization / estrangement.

INTRODUCTION

Like in many disciplines, the need for theories in architecture arose from the tendency to reduce criticism to personal views and even prejudices of a writer. On the other hand, it is largely common for critics to reduce the built environment into two categories: universal and local. Within the intersection of these seemingly opposite concepts, there exist others such as location, context, culture and time, which transform the universal and local duality, that was especially perceived after World War II, into concepts capable of enriching the language and content of architecture. Lewis Mumford, in a 1971 speech, pointed out that the “Modern Movement was regional at heart” (Tzonis, Lefaivre, 2003: 6) suggesting a new reading for the built environment instead of merely reading it as universal or local. This objection to approaching universal and local as two opposite concepts was furthered by Alexander Tzonis, Liane Lefaivre and Kenneth Frampton in the 1980s. With the contribution of these writers, “critical” was appended to the concept of regionalism, building up a new and critical prospect.

Similarly, Frampton, in his 1980 article “Towards a Critical Regionalism: Six Points for an Architecture of Resistance,” discussed six concepts which mediate between universal and local. The main idea of this article was that a designer must engage with the specificities of culture, place, tectonics and tactile experience, otherwise the built environment will only consist of functional entities. Tzonis and Lafaivre on the other hand put forward another concept within the theme of critical regionalism; defamiliarization. Defamiliarization proposes an awareness of the familiar environments of daily life. According to critical regionalism, these concepts need to be taken critically in order to have more ‘appropriate works’ in the built environment. These concepts also pave the way for prolific debates to interpret the built environment.

The aim of this essay is to form a conceptual framework that is “critically regionalist” and enables a reading specific to Han Tümertekin’s B2 and SM Houses. Through this method, the goal is to spotlight the hidden qualities of the buildings which are not perceived at first sight. This reading intends to take the architectural product beyond the familiar way of defining a product on the basis of function, and enables a reading of the interfaces of opposite concepts. The aforementioned houses

* This article is adapted from the Hilal Aycı’s master thesis, “Seeking the Universal within The Local: A Reading Of Han Tümertekin’s B2 and SM Houses Through the Prominent Concepts of ‘Critical Regionalism’ “ (thesis advisor: Associate Prof. Dr. Esin Boyacıoğlu), submitted to the Gazi University Institute of Science and Technology, Ankara, TURKEY, 2008.
mediate between the universal and local and resist against uniformization. Among the concepts of critical regionalism, place and context describe the relationship between buildings and their location. On the other hand, the concepts of tectonics, poetics, tactility and defamiliarization display the architectural aspects which address the senses and intuitions of humans. Thus, they help the reading of the spatial and experimental power of an architectural product without limiting it to the mere functional and visual.

WHAT IS CRITICAL REGIONALISM?

Regionalism in architecture is to design responsibly in reaction to a local context. Adolf Loos has made a clear distinction between “regional” and “regionalism”: the term regional points at an unconscious way of construction, conveyed by culture, from generations to generations, following traditional patterns. Loos explains this by giving examples from native construction. He thus explains the idea of regional in a simple manner: “The peasant builds a roof. Is it a beautiful or ugly roof? … It is the roof as his father, grandfather, and great grandfather had built the roof before him.” (Loos in Frampton 1987: 378). This is an interesting understanding of the term regional that implies an unconscious way of building: just doing what your ancestors have done for ages. But on the other hand, when the suffix “-ism” is added to the concept, the very same act becomes conscious.

As mentioned in the introduction, Mumford was the first to debate the idea of regionalism in architecture. Forty years later, Antony Alofsin following Mumford’s emphasis on regionalism in 1980’s, proposed a new term called “constructive regionalism.” Tzonis and Lefaivre, with their text ‘Why Critical Regionalism Today?’ took Alofsin’s constructive regionalism ideas and coined the term ‘critical regionalism,’ whose main aim is to mediate the local and universal. Such a position criticizes tendencies in architecture to imitate vernacular form in a scenographic way and/or the proliferated copies of international architecture. Critical regionalism resists both of these. Articulated with the concept of ‘critical’, regionalism contains some links with critical theory (Nesbitt, 1996: 483). According to Tzonis and Lefaivre, being critical is essential. For them an architect can criticize regionalism in two ways: the first is to investigate whether the regionalist tradition is legitimate, and the second is to use the method of ‘defamiliarization’ (Tzonis, Lefaivre, 1990: 488).

Frampton adopted and generated these efforts and produced many statements that collectively are something close to a manifesto. Beginning in 1983, with his “Six Points of Resistance” (Culture and Civilization, The Rise and Fall of the Avant-Garde, Critical Regionalism and World Culture, The Resistance of the Place-Form, Culture Versus Nature: Topography, Context, Climate, Light and Tectonic Form, and The Visual Versus Tactile) (Frampton, 1983: 16-30). One can easily perceive that the concept of culture was given priority since it was discussed in three of the six resistance points: as the core of civilization, as the core of regionalism and universal culture, and as the point of impact between human artifact with nature within topography. In addition to context, climate and light are the local values waiting to be discovered by a critical regionalist architect, in addition to tectonic form, which should add poetic value to the culture of building. The tactile is introduced to architecture along with the visual to enrich the perceived architecture.

Frampton’s efforts on this subject evolved over a period of sixteen years. Frampton’s six point evolved into ten points in 1987 under the headline of “Ten Points for an Architecture of Resistance.” (Critical Regionalism and Vernacular Form, The Modern Movement, Myth and the Reality of the Region, Information and Experience, Space/Place, Typology/Topography, Architectonic/Scenographic, Artificial/Natural, Visual/Tactile, Post-Modernism and Regionalism: A Summation) (Frampton, 1987: 374-385) This time, Frampton discussed critical regionalism in relation to vernacular form. He also questioned the concept of “region” with its historical and mythological background and put into debate the known and the experienced while adding a new concept: Post-modernism.

We can assume that the concept of critical regionalism, encompassing the ‘critical’ approach, highlights some of the potential tension between dichotomies such as traditional and contemporary, old and new, universal and regional, natural and
artificial, visual and tactile, myth and reality, modern and postmodern, and thus proposes various key points to initiate a resistance to existent architectural understanding. Some of these concepts are perceived as appropriate thresholds of resistance against the banality of the built environment. Thus, some of these critical positions can be used as tools in the evaluation of Tümertekin’s B2 and SM Houses.

THE POINTS OF RESISTANCE

The following dichotomies can be derived from these conceptual debates and developments surrounding critical regionalism. It is not through the classification of these ‘dichotomies’ as opposing polar points but through the reading of the connection and intercorrelations of said ‘dichotomies’ that the reading gains value. It will be through such a reading that this study will be conducted. Additionally, some of Frampton’s resistance points, such as tactile, place, context, and tectonic as well as poetic, stand out as clear and unambiguous points for one to use as tools to evaluate the two buildings in question. Similarly, Tzonis and Lefaivre’s concept of defamiliarization/estren-\ngment has been chosen as another tool to read these buildings. Simultaneously, these chosen points act as key concepts or thresholds against built environments that lack character and identity.

Frampton’s view of critical regionalism especially calls for the first resisting point of this study, the tactility. The tactility encourages the architect to go beyond the visual and incorporate a sense of touch as well as other senses such as smelling, hearing, etc. Among the literature on tactility, Juhani Pallasmaa’s discussion on the relationship between the tactile and architecture seems to be the most extensive. According to Pallasmaa, “a wise architect must work with his/her entire body. In his opinion, even during the designing process, drawing by hand and making models provides a tactile experience for the architect.” For Pallasmaa, “today’s new technologies such as computer aided design, although being beneficial, flatten a designer’s imagination and creates a distance between the maker and the object” (Pallasmaa, 2005: 13).

Experience is another key point for “the tactility.” That is, we can only realize the effect of the other senses through experience. For example, in order to feel the texture or smell of a material, only seeing is not enough. In addition to seeing, touching and smelling are also needed. We can only understand the quality of light in a space by experiencing it with the contribution of all these senses. Tactility makes us to perceive the spaces in many ways, in addition to the act of seeing. Such an approach allows individuals to have unique experiences of their own, which makes tactility an important point to understand the built environment as well as buildings themselves.

Frampton’s second resistance point, the concept of place is about setting limits in a conscious way and being sensitive to local material, available labour, local climate, light and topography. Besides these materialistic potentials of a region, this entails the Heideggerian view of ‘belonging’—a sense of belonging when one consciously feels safe in a place. (Frampton, 1987). Furthermore, critical regionalism asks designers to go beyond the values present in the immediate context and engage with those that are universally enlightening.

Context, the third point, is a term which has a close relationship with place. Sandy Isenstadt has stated that “Context takes its place in a spectrum of terms concerned with perception of place and the creation of placefulness,” (Isenstadt, 2005: 160). Underlining this close relationship with context and place, Isenstadt also refers with these words to the complicated aspect of context: that it always changes with the surrounding circumstances, making it both a generic and specialized term.

On the other hand, in the view of critical regionalism, context can be described as being aware of the existing values of a region such as light, material, existing forms, fabric, etc. But this is not enough or the only fact. Critical regionalists agree on the fact that the condition of the existing environment should be understood in all its details, and then it should be transformed. Context is a necessary concept to understand the reality of a place because it conveys a lot of data about that place.

The fourth resistance point, tectonic, is a term that has been interpreted in several ways by different authors. The definition that suits the pur-
The purpose of this study is as follows: Supporting structures in a building are necessary elements. Nevertheless, the expression of that building requires something more than simply exposing these elements. Since expression requires a coherent relationship between parts, a certain poetic addition is needed for this purpose. Thus the fourth and the fifth resisting points; tectonic and poetic can be inherently connected. Tectonics refers to that which enables the designer to achieve harmony of parts. Tectonics in Frampton’s sense is the poetics of construction. When one is speaking about the poetry of architecture, it embodies more than the physical being of the built environment, it indicates something that appeals to our senses, thus it is also connected to the concepts of tactile, place and context.

Amongst the literature on poetry, Heidegger’s article entitled ‘Poetically Man Dwells’ explains how poetry relates to construction or the ‘art of meaning.’ Heidegger explains poetry through its etymology: the word ‘poetry’ comes from the Ancient Greek word ‘poiesis,’ which means ‘to do something,’ which implies that there is such a thing as a poetic way of making (Heidegger, 1971: 217-228). Starting from the point of tectonics, we can identify the poetics of architecture. It is common for poets use words in a way that they compose an effective result. The poetic effect of architecture lies in the art of construction. In this case, the poetic of critical regionalism asks if architecture can achieve the same effect of poetry by using its own elements such as slab, beam, column and their construction. According to Frampton, this kind of poetic constructing of structure is a kind of resistance against the materializa-
tion of the built environment (Frampton, 1983: 16-30).

It is a generally accepted fact that human beings have the tendency to take for granted certain familiar characteristics of their environment. From this point of view the last resistance point the concept of defamiliarization/estrangement embraces a kind of method that can be helpful to highlight the valuable characteristics of an environment that escapes our sight because we do not pay attention to it in our daily life routine implying that in fact one may become aware of such characteristics and their values with using the familiar in an unfamiliar way. Evaluating those values and increasing their significance leads to their discovery once again with brand new features.

The purpose of the current study is to analyze two houses designed by Turkish architect Tümer, which are exceptional in their way of standing in their environment, through the conceptual framework of critical regionalism: tactility, placeness, contextuality, tectonic, poetic and defamiliarization/estrangement, as manifested in the entire houses as well as their significant parts.

**ANALYSIS OF TWO HOUSES**

Both the B2 House (2001) and the SM house (2005) are located on the edge of the village of Büyüküşün, Turkey. The houses are not for permanent use, having been designed to be used at weekends or short vacations. The owners of the B2 House are contemporary nomads, changing places frequently, using the latest information technologies to keep in touch with their work. The main criteria for the house was short-term use and low maintenance (Sarkis, 2007: 16, 26). B2 itself is a two storey house, located at the edge of its site. The house has a very simple rectangular layout and is approached from the rear. The structure consists of three parts; two reinforced concrete walls framing a hand crafted stone wall. These elements continue on to the roof surface. Bathrooms, laundry area, storage, kitchenette and fireplace are placed within one of the reinforced concrete walls, thereby forming a compact rectangular box. This creates the free spaced layouts of the living room on the ground floor and for the two bedrooms on the first floor which are only accessible through an open air staircase. The balcony is steel construction with a wooden floor extending towards the interior on the second floor (Fig. 2-3).

SM House is similarly a weekend house for a family and has a simple layout; an elongated rectangle. The house is located on the slope of the village and is bordered on its rear by the retaining wall of the village road. The house has two alternative outer spaces; one at the back, on the north side, and the other, the garden on the south side. The masonry wall, supported by a steel construction, continues on through the roof and provides the outer shell of the house. The concrete units, making up the structure of the house, run parallel to the short edge of the rectangle. These concrete units are designed in the form of boxes, housing the service areas such as walk-in-closets and bathrooms; they act as partitioning units organizing the floor into separate bedrooms. The south wall of the house is completely transparent and opens to the view. The open kitchen and the living room designed as a total space, merge into a loggia which is roofed with crushed stone filled in wire grids, letting sun shine through the gaps among the crushed stone. This semi-open space both sepa-
rates and at the same time connects the guest room to the rest of the house (Fig. 5).

**Tactility**

“The space of dwelling is not a geometrical but an existential one, resulting from our phenomenological perception of place. Its construction is grounded in experience.” (De Sola-Morales, 1997: 47).

Tümerbekin himself declares his engagement with tactility through the usage of physical and perceptual elements of the site and local settlement. He also says that he is constantly concerned with topography, view, local materials, light, and climate, which are the realities of the site and relevant to tactility (Tümerbekin, 2008). By perceptional elements, Tümerbekin means the architect’s sensivities as well as the client’s sensibility. From records of conversation between Tümerbekin and the client of the SM House, we can understand that the client’s preference was to live in loft-like volumes of industrial buildings, appreciating their simplicity in construction and appearance. Thus, the industrial aesthetic had a direct influence on this project (Tümerbekin, 2008). Tümerbekin has translated the experiences the client wanted to bring in their life into a design such that the local villagers associated the building with an olive oil factory, the most familiar industrial building type in the area.
Tümerkent begins his designs with the question of what he already has in hand. In the case of Büyükhüsun Village, local materials, craftsmanship, hill-top location, and views of the Aegean Sea and landscape are the existing factors which seem to have influenced him. Mostly, however, Tümerkent has been influenced by the local stone. As can be seen, stone has been used as the primary material in both houses. The B2 House is a composition of stone walls, concrete columns, and reed screens, whilst the SM House is a composition of stone, steel and glass (Fig. 7-8). Both compositions not only create a visual impact but also a texture that challenges the nature of the materials – belonging to the village but at the same time alienated from it.

The way natural light and materials are assembled in these two houses create an experimental atmosphere that is more than just a visual display. The light filtered through the reed shades in the B2 House and through the stone fragments placed in between two wire grids on the roof of the SM House lead to varying perceptions in different seasons. As indicated by Frampton, the effect of light and material do not come to an end with the construction of the building. Their relationship continuously transforms in time depending on time and space, creating a constantly transforming experience (Fig. 9-10).

Tümerkent’s impression of the streets of the Büyükhüsun village are also reflected in his designs. The area between the back wall of the SM House (Fig. 12) and its retaining wall seems to be a reflection of the village’s stone streets (Fig. 11). Thus, the hand craftsmanship, material, and spatial experience of the village continue to be experienced in the houses as well. However, there is a significant difference here: while the street of the village is a public space, it becomes a private space in the SM House. Tümerkent not only makes use of what he perceives there, but he also questions its meaning and transforms it.

In his visits to the B2 House following its completion, Tümerkent has indicated that every time he approaches to the building from the village, he pauses momentarily. This pause is a sign of being at the threshold of a totally new and different experience. Even for its own designer, the building offers new opportunities of experience at each visit. The designer’s pause proves that the building encompasses various impacts and rich experiences. The B2 and SM Houses exist with both their perceptual richness like material, light, texture and their visual richness.

**Placeness/Contextuality**

Meaning sets certain limits. Through these two buildings, the village gains a new meaning. First of all, Tümerkent engages with the materiality of Büyükhüsun village, which is predominantly made of stone. Both the B2 and SM Houses have cubic forms. Openings in their stone walls are perfectly collaborated to fit the discipline of stone construction. Most of the openings frame significant views from the two houses (Fig. 13). In architecture, it is also possible to interpret the concept of place in...
other ways than the meaning imposed by the user of the space. Surrounding trees, plants and other such landscape elements can be taken into consideration and the design can adapt according to the topography. When viewed from this aspect, the B2 and SM Houses are sensitive to local materials, local craftsmanship, light, climate and scenery. However, what is discussed in the context of the B2 and SM Houses is not what is associated with the concept of place. Rather, the design method Tümerşkin brings forward problematizes “place” – determining “what do I have in hand” – and asks questions to place about what it expects and generates the appropriate answers.

In the B2 and SM Houses, existing limitations are delineated: local materials, local craftsmanship, scenery, etc. However, there is another aspect of place that has to do with ensuring a feel-
ing of safety – as in Heidegger’s definition of the sky forming a dome like a boundary. That is, a feeling of safety makes one belong to that “place.” Situated on the slope of the village, these two houses literally stand on the border. Their facades opening to the slope are as transparent as they can be, and when they turn their back to the village, they are opaque (Fig. 14-16). Looking from the interior of the house to the exterior, it is difficult to distinguish the difference between outside and inside. The borders of inner space pass through the transparent glass surfaces and open out to the Aegean Sea. The horizon line where the sea and sky meet almost forms the limit of the houses’ inner space. Tümerterekin pushes the limits of the relationship he establishes with “place” by using wide glass surfaces and positioning the buildings on the edge of the village. Another part of the building becomes the emptiness belonging to place, with scenery and sea making the space coexist with them. This effort and attitude is sensed in both houses, which experiment with the tension of perceptual and physical limitations, and is a sign of the problematization of settling on earth and also an answer produced to that problem (Fig. 13).

Looking at the silhouette of Büyük Hüsun Village (Fig. 1), it can be seen that the B2 and SM Houses have taken the existing context into consideration with their cubic forms and stone textured surfaces. However, on approaching the houses, it is evident that the stone texture applied is different from the other houses of the village. Keeping the joints recessed from the stone surface has turned a traditionally two-dimensional element into a three-dimensional one. This differentiation in the detail exceeds the existing context (Fig. 15). Even if Tümerterekin’s starting point was the contextual framework of the region, he was not content with merely reproducing it and has gone beyond the existing context. Because of this attitude and its humble dimensions, the B2 House can be perceived as a small cottage, although it creates a monumental effect by its location on the site. On the one hand, the positioning of the building on the border of the site sweeps away the line between itself and the scenery. On the other hand, it also turns the building from “being just a 6-10 rectangular prism into a slope-situated monument” (Fig. 7) (Korkmaz, 2001: 74-79).

Both houses make use of the existing context. However, in addition to the relationship they form with the place and context, they also reflect current conditions. The steel supports and wide glass surfaces used in SM House stretch the technical possibilities of reinforced concrete and make the buildings speak out loud that they belong to the
era in which they were built. From this point of view, it can be concluded that the local-universal distinction which has frequently engaged the architectural milieu is not a dichotomy to be separated in these examples through clear lines. The situation of the B2 and SM Houses is a hybridity which starts with what is existent in the “place,” but also embraces present possibilities.

Tectonic/Poetic

On defining the poetic construction of the tectonic shell and harmony in assembling the architectural elements, the question arises: How can the poetics of architecture add meaning to life? In the case of the B2 and SM Houses, the idea of poetics of architecture is realized in the manner which natural light is handled in an elegant and controlled way. For instance, in the SM House, the traditional pergola format has been interpreted. Instead of wooden planks over the pergola, Tümtėrkėn used loose pieces of rocks filled between a wire mesh and natural light filters through the gaps. Tümtėrkėn here transforms the non-permanent nature of light and shadow in a traditional pergola to something that is everlasting and yet varied in different senses. Here lies the poetry of Tümtėrkėn’s architecture (Fig. 10).

When words come together in poetry, they transcend their literal meanings. The assembly of architectural elements in the B2 and SM Houses has a similar impact as poetry. In the B2 House, the meeting of concrete surfaces with stone, together with the warmth and rurality of the reeds and in the SM House, the stone walls filling the gaps in between the steel structures not in a customary way but in a tectonic proficiency, create an effect similar to that of poetry.

In B2 House all the structural components are exposed as such that the gap on the surface between the stone wall and the floor also stands for the traditional skirting. The walls and the floors are separated by a gap, not by another element, and this gap has been used for the electrical installation. The architect’s tectonic expression power has revealed itself in other details as well (Fig. 15). In a similar way, the steel columns which emphasize the verticality and visibility from the outside of the SM House, also prove that the tectonic power of the building continues in details like holding the rainwater pipes at the same time. In both buildings, the way that parts come together has led the architect to produce a poetic result by his displaying a tectonic sensitivity (Fig. 14).

Defamiliarization / Estrangement

The way that Tümtėrkėn uses the stone material in the B2 and SM Houses differrent then its present usage and resembles this “alienation” method of critical regionalism. When read through the concepts introduced to the architectural field by Tzononis and Lefaivre, these houses by Tümtėrkėn gain different meanings. While one walks in the streets of the village through the familiar stone walls, all of a sudden a different stone texture is encountered. This discrepancy leads to momentary hesitations, going beyond the ordinary. Nor is this all for the stone texture; it continues in the roofs of both houses by going beyond the ordinary once more. The stone that is normally accustomed to be seen as a vertical element is transferred to a horizontal roof situation. The stone that continues as a terrace roof in the B2 House becomes a hipped roof in the SM House. Playing the lead role in “alienation” in the B2 and SM Houses, stone has gone beyond the mental codes of usage and proven that it is possible to discover different usages.

CONCLUSION

How can an architectural construction achieve a close bond with its location? And, at the same time, use the language of today’s architecture avoiding imitations and replications? Responding to these questions, the B2 and SM Houses in Büyükhüsun Village disappear in the silhouette of the existing village houses. When approached, they speak out loud that they are products of today having a dif-
ferent presence. They adapt to the place and belong to the locality; they are local. But at the same time, they use a language which is not strange to someone in the other part of the world. They are universal in this respect. While the place and context concepts taken from the approach of critical regionalism give meaning to the relations these two house form with what already exists, the tectonic-poetic and defamiliarization concepts assist us in reading the sensuous aspects of these two house, like traditional materials, methods and values that have been used in different forms, thus gaining different qualities. For Tümertekin, it was not enough to let these two houses exist with just the local values. Rather, Tümertekin strived for the users to have experiences unique to these buildings.

As an idea based on human experience, experimentalism reminds us that architecture is not merely a visual phenomenon. The stone walls of the B2 House have revealed that the building is alien from the daily practices of the village with its tense location on a slope at the edge of the village. The natural light that is filtered through the reed screens into the interior causes a perception of space that is in continuous movement. Similarly, the SM House unfolds different experiences in each season due to the light filtered through the stones in between wire grids and the stone walls. Place is hidden in the site, and it comes out only when meaning is attached to the space. Architects should be aware of the limitation of the place. Limitations are defined as landscape, topography, climate, economy, and user which are associated with context in all aspects. Using stone as the local material and by relating to the landscape and village, the B2 and SM Houses prove that they are aware of the limitations of the place.

The poetic construction and tectonic expressive force of the shell gives a poetic quality to a building. Poetry is a unique art and it is hard to replicate. However, each reader gets a different feeling out of it. Discussing poetry and architecture together is one of the most important ideas which oppose the uniformization in the built environment. In both houses, the architectural elements, the load bearing materials and light came together in an impressive way like the words in a poem and went beyond their literal meaning. The combination of concrete and stone in the B2 House, and steel and stone in the SM House, create a tectonic expressive force.

When repetition is mere replication, it leads to monotony. Each repetitive action turns into activities performed unconsciously in time. In architecture as well, repetition gives rise to monotony. Nevertheless, an architectural product that raises risks questions every architectural element. It challenges the existent, re-uses it in other forms, and in the end re-discovers it. In other words, the existent becomes alienated and opposes unconscious repetition. The merely passed by, the unnoticed, the accustomed, and the invisible comes into view. In
the B2 and SM Houses, the stone which is a vertical element continues in the roof level as well. The familiar draws attention with its different presence. In a way, it is renovated and gains a new value. A new awareness appears. At the same time, it enables the reconsideration of the roof element, revealing that it can bear different possibilities.

The B2 and SM Houses take the already existent in the place as their starting points. However, they challenge any universal-local opposition by making use of present design practices and contemporary technology. They reveal that local and universal values can co-exist in the same building. In these houses, local is not merely repeated. Rather, it is questioned and redesigned. From the layout decisions to the details, each design element answers queries for that specific place and moment. That is, the houses are designed for that time and place. The architect started the design process with similar questions, but Tümertekin has not sought the answers in stereotype results. Instead, Tümertekin has looked for different solutions. That is, Tümertekin has problematized the local and conveyed everything which founded as the good and right in this notion to a universal language. Both houses have succeeded in adding different meanings to their localities.

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Although experimental buildings have been built around the world, the difficulties of implementation on a larger scale prevail. Only a few efforts have been made to organize the knowledge and to formulate the implementation strategies for the builders and designers. The research on flexible buildings address the technical components, but the possibility of integration with the current housing market is overlooked. Thus, this book is a significant contribution in the effort to fill the gap “between theories pertaining to flexibility and the reality of housing market” not only for North America, as the author explained, but also for the rest of the world. The publication of the book is a significant addition to the literature on flexible housing.

The objectives of the book are premised on the understanding that flexibility has not been generally accepted in North America because of the problems of implementation. It intends to develop a project based decision-making model to assist designers and builders in determining the relevant level of flexibility which is best fit to their particular projects.

The book is informative and serves as a conceptual instrument for the housing decision makers, including governmental housing organizations, private housing developers and builders, designers, and other promoters who want to design flexibility projects. It is useful for programmers, housing researchers, and students of architecture and building management. It can provide inspiration to residents and the general public who are interested in new living styles as well as in benefits from monetary savings and better living standards during their residency.

Selected keywords: Flexibility, implementation, strategies, economics, alternatives.
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